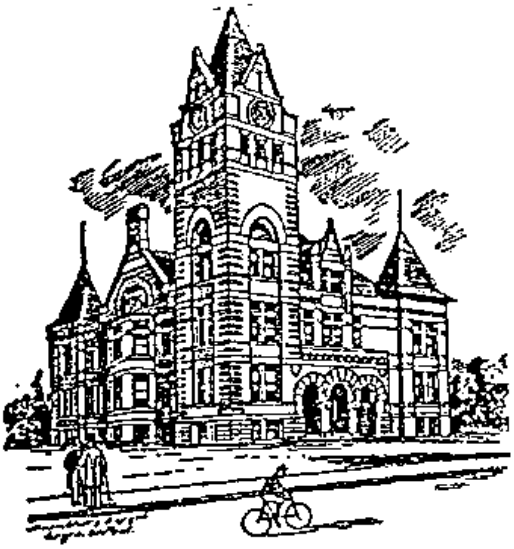

Waseca County, Minnesota
All-Hazard Mitigation Plan
2013 Update

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All-Hazard Mitigation Plan
2013 Update

Adoption Date: 5/6/2013

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1.0 INTRODUCTION

1.1 HAZARD MITIGATION[1]

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from natural hazards and their effects. Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. This definition distinguishes actions that have a long-term impact from those that are more closely associated with immediate preparedness, response, and recovery. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

The U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) has made reducing hazards one of its main goals. The primary mechanism for achieving this goal is hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies to mitigate hazards.

1.2 MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING[2]

The Waseca County All-Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan. A multi-jurisdictional plan is a plan jointly prepared by more than one jurisdiction, or local government entity (county, city, township, etc.). Jurisdictions can benefit in several ways from a multi-jurisdictional planning process, such as:

- enabling a comprehensive approach to the mitigation of hazards that affect multiple jurisdictions;
- allowing for economies of scale by leveraging individual capabilities and sharing costs and resources;
- avoiding duplication of efforts; and
- imposing an external discipline on the process.

A full list of the participating jurisdiction is provided below.

Figure 1-1: Participating Jurisdictions

Jurisdiction Name
Waseca County
City of Janesville
City of New Richland
City of Waldorf
City of Waseca

1.3 LEGAL AUTHORITY & JUSTIFICATION

1.3.1 Disaster Mitigation Act of 2000[3]

The Disaster Mitigation Act of 2000 (DMA 2000), also known as Public Law 106-390, provides the legal basis for FEMA mitigation planning requirements for State, local and Tribal governments as a condition of mitigation grant assistance. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (which had amended the Disaster Relief Act of 1974) by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for State, local, and Tribal entities to closely coordinate mitigation planning and implementation efforts. Under the DMA 2000, local plans are required to 1). describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and 2.) establish a strategy to implement those actions.

1.3.2 44 CFR §201.6[4]

The Code of Federal Regulations Title 44 Chapter 201 Section 6 addresses "Local Mitigation Plans". This section requires that local governments seeking funding from four out of the five mitigation assistance programs must have a FEMA authorized local hazard mitigation plan. The only program that does not require a local mitigation plan is the Repetitive Flood Claims program (see 1.4.1.D below).

1.3.2.A. Plan Update Requirement

44 CFR §201.6 also requires that local jurisdictions must review and revise their plans to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five years in order to maintain eligibility for mitigation project grant funding.

1.3.3 Governor's Executive Order 11-03[5]

The Minnesota Governor's Executive Order 11-03 clarified the roles and responsibilities of state agencies in emergencies. The Department of Homeland Security and Emergency Management was assigned overall responsibility for coordinating the development and maintenance of the all-hazard Minnesota Emergency Operations Plan.

1.3.4 Minnesota State Statutes, Chapter 12.09[6]

Chapter 12, Section 9, Subdivision 7 of the 2011 Minnesota State Statutes dictates that the Division of Emergency Management shall develop and maintain a comprehensive hazard mitigation plan for this state, with the plan integrated into and coordinated with the hazard mitigation plans of the federal government to the fullest possible extent. The division shall coordinate the preparation of hazard mitigation plans by the political subdivisions, with the plans integrated into and coordinated with the hazard mitigation plan of this state to the fullest possible extent.

1.3.5 Minnesota State Statutes, Chapter 394.21[7]

Chapter 394, Section 21, Subdivision 1 of the 2011 Minnesota State Statutes dictates that any county in the state having less than 300,000 population according to the 1950 federal census is authorized to carry on county planning and zoning activities for the purpose of promoting the health, safety, morals, and general welfare of the community.

1.4 FEDERAL HAZARD MITIGATION ASSISTANCE[8]

FEMA's Hazard Mitigation Assistance (HMA) programs present an opportunity to reduce or eliminate the risk to human life and property from natural hazards, while simultaneously reducing reliance on Federal disaster funds through hazard mitigation planning and project grant funding. Under the DMA 2000 (see 1.3.1 above) local jurisdictions are required to take part in the preparation and adoption of a hazard mitigation plan as a condition for receiving the non-emergency disaster assistance offered through HMA programs. Only one of the five HMA programs does not include this requirement: the Repetitive Floods Claim Program.

At the Federal level, FEMA administers the HMA programs, for which states (the applicant) apply for funding on behalf of local jurisdictions (the sub-applicant). At the state level, in Minnesota, all HMA programs are administered by the Department of Public Safety's Division of Homeland Security and Emergency Management (HSEM). HSEM State Hazard Mitigation Officers oversee all aspects of the programs, including: applications for funding, management of grant awards, and state approval of local mitigation plans. The Department of Natural Resources (DNR), as the agency responsible for implementation of the National Flood Insurance Program (NFIP), is also involved in mitigation efforts.

There are five HMA programs: the Hazard Mitigation Grant Program, Pre-Disaster Mitigation, Flood Mitigation Assistance, Repetitive Flood Claims, and Severe Repetitive Loss. A summary of the various HMA programs is provided below. Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent. Projects funded through an HMA program must demonstrate a positive cost-benefit ratio (i.e. the future benefits are equal to, or greater than, the cost of the project).

1.4.1 Hazard Mitigation Assistance Programs

1.4.1.A. Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) is designed to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the immediate reconstruction and recovery process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. The amount of HMGP funding available to the applicant is based upon the estimated total Federal assistance to be provided by FEMA for disaster recovery under the disaster declaration. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42 United States Code (U.S.C.) 5170c.

1.4.1.B. Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program is designed to assist States and local jurisdictions to implement a sustained pre-disaster natural hazard mitigation program to reduce the overall risk to human life and structures from future hazard events, while also reducing reliance on Federal funding from future disasters. The PDM program is authorized under Section 203 of the Stafford Act, 42 U.S.C. 5133.

1.4.1.C. Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program is designed to reduce or eliminate the long-term risk of flood damage to properties insured under the NFIP. The FMA program is authorized under Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c.

1.4.1.D. Repetitive Flood Claims Program

The Repetitive Flood Claims (RFC) program is designed to reduce flood damage to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time. The RFC program is authorized under Section 1323 of the NFIA, 42 U.S.C. 4030.

1.4.1.E. Severe Repetitive Loss Program

The Severe Repetitive Loss (SRL) Pilot program is designed to reduce flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest savings to the NFIF in the shortest period of time. The SRL is authorized under Section 1361A of the NFIA, 42 U.S.C. 4102a.

1.4.2 Program Funding Sources

The NFIF provides funding for FMA, RFC, and SRL programs. The PDM, FMA, RFC, and SRL programs are subject to the availability of appropriation funding, as well as any program specific directive or restriction made with respect to such funds.

1.4.3 Cost Sharing[9]

Under the HMA programs, the total cost to implement approved mitigation activities is generally funded by a combination of Federal and non-Federal sources. Both the Federal and the non-Federal shares must be eligible costs used in direct support of approved activities under grant award. Contributions of cash, third party in-kind services or materials, or any combination thereof, may be accepted as part of the non-Federal cost share. For FMA, no more than half of the non-Federal contribution may be from third party in-kind contributions. In general, HMA funds may be used to pay up to 75 percent of the eligible activity costs; the remaining 25 percent of eligible activity costs are derived from non-Federal resources. Exceptions to the 75/25 cost share are shown in Figure 1-2 below.

Figure 1-2: HMA Program Cost Share Ratios

Programs	Mitigation Activity (Percent of Federal/Non-Federal Share)
HMGP	75/25
PDM	75/25
PDM - subgrantee is small impoverished community	90/10
PDM - Tribal Grantee is small impoverished community	90/10
FMA	75/25
FMA - severe repetitive loss of property with Repetitive Loss Strategy	90/10
RFC	100/0
SRL	75/25
SRL - with Repetitive Loss Strategy	90/10

1.5 ELIGIBLE HAZARD MITIGATION ASSISTANCE PROJECTS[10]

Projects eligible for Hazard Mitigation Assistance (HMA) are described in the FY2011 Hazard Mitigation Assistance Unified Guidance.[11] This document consolidates the common requirements for all HMA programs and explains the unique elements of the programs in individual sections. Additionally, it provides assistance for Federal, State, Tribal, and local officials on how to apply for HMA funding for a proposed mitigation activity. The following is a summary of the eligible projects identified within the FY 2011 HMA Unified Guidance.

Figure 1-3: Hazard Mitigation Actions by Program

Eligible Activities	HMGP	PDM	FMA	RFC	SRL
Mitigation Projects	x	x	x	x	x
Property Acquisition and Structure Demolition	x	x	x	x	x
Property Acquisition and Structure Relocation	x	x	x	x	x
Structure Elevation	x	x	x	x	x
Mitigation Reconstruction					x
Dry Floodproofing of Historic Residential Structures	x	x	x	x	x
Dry Floodproofing of Non-residential Structures	x	x	x	x	
Minor Localized Flood Reduction Projects	x	x	x	x	x
Structural Retrofitting of Existing Buildings	x	x			
Non-structural Retrofitting of Existing Buildings and Facilities	x	x			
Safe Room Construction	x	x			
Infrastructure Retrofit	x	x			
Soil Stabilization	x	x			
Wildfire Mitigation	x	x			
Post-Disaster Code Enforcement	x				
5% Initiative Projects	x				
Hazard Mitigation Planning	x	x	x		
Management Costs	x	x	x	x	x

1.5.1 Flood Mitigation Projects

1.5.1.A. Property Acquisition & Structure Demolition

Property acquisition and structure demolition projects involve the voluntary acquisition of an existing at-risk structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.

1.5.1.B. Property Acquisition & Structure Relocation

Property acquisition and structure relocation projects involve the voluntary physical relocation of an existing structure to an area outside of a hazard-prone area and, typically, the acquisition of the underlying land. Relocation must conform to all applicable State and local regulations. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.

1.5.1.C. Structure Elevation

Structure elevation projects involve physically raising an existing structure to the Base Flood Elevation (BFE) or higher if required by FEMA or local ordinance. Structure elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above, and utilities must be properly elevated as well.

1.5.1.D. Mitigation Reconstruction

Mitigation reconstruction projects involve the construction of an improved, elevated building on the same site where an existing building and/or foundation has been partially or completely demolished or destroyed. Mitigation reconstruction is only permitted for structures outside of the regulatory floodway or coastal high hazard area as identified by the existing best available flood hazard data. Activities that result in the construction of new living space at or above the BFE will only be considered when consistent with the mitigation reconstruction requirements. Such activities are only eligible under SRL.

1.5.1.E. Dry Floodproofing

Dry floodproofing projects involve the application of techniques designed to keep structures dry by sealing the structure to keep floodwaters out.

1.5.1.F. Minor Localized Flood Reduction Projects

Minor localized flood reduction projects aim to lessen the frequency or severity of flooding and decrease predicted flood damages, such as the installation or modification of culverts and stormwater management activities (e.g. creating retention and detention basins). These projects must not duplicate the flood prevention activities of other Federal agencies and may not constitute a section of a larger flood control system.

1.5.2 Flood, Earthquake, & Tornado Mitigation Projects

1.5.2.A. Structural Retrofitting of Existing Buildings

Structural retrofitting of existing buildings projects involves modifications made to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants. The structural elements of a building that are essential to protect in order to prevent damage include: foundations, load-bearing walls, beams, columns, building envelope, structural floors and roofs, and the connections between these elements.

1.5.2.B. Non-Structural Retrofitting of Existing Buildings & Facilities

Non-structural retrofitting of existing buildings and facilities projects involves modifications made to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Non-structural retrofits may include bracing of building contents to prevent earthquake damage or the elevation of heating and ventilation systems.

1.5.2.C. Safe Room Construction

Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events. For HMA, the term "safe room" only applies to extreme wind (combined tornado and hurricane) residential, non-residential, and community safe rooms; tornado community safe rooms; and hurricane community safe rooms. This type of project includes retrofits of existing facilities or new safe room construction projects, and applies to both single and multi-use facilities.

1.5.2.D. Infrastructure Retrofit

Infrastructure retrofit projects involve measures to reduce risk to existing utility systems, roads, and bridges.

1.5.2.E. Soil Stabilization

Soil stabilization projects aim to reduce risk to structures or infrastructure from erosion and landslides, including installing geo-textiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring. These projects must not duplicate the activities of other Federal agencies.

1.5.3 Wildfire Mitigation Projects

1.5.3.A. Defensible Space for Wildfire

Defensible space for wildfire projects involves the creation of perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation.

1.5.3.B. Application of Ignition-Resistant Construction

Application of ignition-resistant construction projects involve the application of ignition resistant techniques and/or non-combustible materials on new and existing homes, structures, and critical facilities.

1.5.3.C. Hazardous Fuels Reduction

Hazardous fuels reduction projects involve the removal of vegetative fuels near to the at-risk structure that, if ignited, pose significant threat to human life and property, especially critical facilities.

1.5.4 All-Natural Hazard Mitigation Projects

1.5.4.A. Post-Disaster Code Enforcement

Post-disaster code enforcement projects are designed to support the post-disaster rebuilding effort by ensuring that sufficient expertise is on hand to ensure appropriate codes and standards are utilized and enforced.

1.5.4.B. 5% Initiative Projects

Five percent initiative projects provide an opportunity to fund mitigation actions that are consistent with the goals and objectives of the State and local mitigation plans and that meet all

HMGP program requirements, but for which it may be difficult to conduct a standard BCA to prove cost effectiveness.

1.5.4.C. Hazard Mitigation Planning

Mitigation plans are the foundation for effective hazard mitigation. A mitigation plan is a demonstration of the commitment to reduce risks from natural hazards and serves as a strategic guide for decision makers as they commit resources.

1.6 PRESIDENTIAL DISASTER DECLARATIONS

Since 1953, there have been seven Presidential Disaster Declarations and one Emergency Declaration that have included Waseca County. These declarations are displayed in Figures 1-4 and 1-5 below. By comparison, there have been 48 Presidential Disaster Declarations and five Emergency Declarations in the State of Minnesota during the same time period, including those in Waseca County.

Figure 1-4: Waseca Co. Major Disaster Declarations (1953-2011) [12]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-1941	9/22/2010 - 10/14/2010	10/13/2010	Severe Storms / Flooding	Obama	Public
DR-1158	1/3/1997 - 2/3/1997	1/16/1997	Severe Winter Storms / Blizzards	Clinton	Public
DR-1151	11/14/1996 - 11/30/1996	1/7/1997	Severe Storms / Heavy Snow	Clinton	Public
DR-1116	3/14/1996 - 6/17/1996	6/1/1996	Flooding	Clinton	Public
DR-993	5/6/1993 - 8/22/1993	6/11/1993	Flooding / Severe Storms / Tornadoes	Clinton	Individual & Public
DR-929	10/31/1991 - 11/29/1991	12/26/1991	Ice Storm	GHW Bush	Public
DR-188	4/11/1965 - 4/11/1965	4/11/1965	Flooding	Johnson	Individual & Public

Figure 1-5: Waseca Co. Emergency Declarations (1953-2011)

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
EM-3242	8/29/2005 - 10/1/2005	9/13/2005	Hurricane Katrina Evacuation	GW Bush	Public

2.0 PREREQUISITES

This updated plan has been prepared in accordance with the requirements of the Disaster Mitigation Act of 2000 with the intention that it be adopted by the county and each incorporated jurisdiction subsequent to State and Federal approval. The adopting resolutions and the dates of adoption are included in Appendix 9.1.

2.1 MULTI-JURISDICTIONAL PLAN ADOPTION

After HSEM and FEMA review the plan and approve it "pending local adoption" the Waseca County hazard mitigation planning team will present the plan to the county and city officials of each jurisdiction for adoption. Resolution adoptions and adoption dates are included in Appendix 9.1 of this plan.

2.2 JURISDICTIONAL PARTICIPATION

All incorporated jurisdictions participated in the review and update of the *Waseca County All-Hazard Mitigation Plan*. All cities that participated in the initial 2008 plan participated in the 2013 update, see Figure 2-1 below. Townships participated as part of Waseca County.

Figure 2-1: Jurisdiction Participation

Jurisdiction Name	Hazard Identification	Risk Assessment	Mitigation Strategies	Public Participation
Waseca County	✓	✓	✓	✓
City of Janesville	✓	✓	✓	✓
City of New Richland	✓	✓	✓	✓
City of Waldorf	✓	✓	✓	✓
City of Waseca	✓	✓	✓	✓

3.0 PLANNING PROCESS

Waseca County Emergency Management and Region Nine Development Commission joined efforts for the five year review of this mitigation plan. Waseca County realizes that the recognition of and the protection from hazards impacting the county and its residents contribute to future community and economic development.

The planning process was organized by the planning team and consisted of the following tasks:

Task 1: Organize Resources

The County Emergency Manager, with support from Region Nine Development Commission, created a planning team to attend meetings, gather data and historical information, review drafts, and participate in mitigation brainstorming sessions.

Task 2: Risk Assessment

The planning team reviewed the natural and technological hazards in the existing plan and identified which hazards to include in the update. The planning team developed hazard profiles. Each profile included a hazard definition, history of previous occurrences, and a summary of the hazard's extent, location, and potential impact. The planning team then used local, state, and national resources to inventory the county's assets and estimate potential losses for each hazard.

Task 3: Develop Mitigation Strategies

The planning team met with representatives of each community to develop and prioritize mitigation strategies and action items that would reduce the costs of disaster response and recovery, protect people and infrastructure, and minimize overall disruption to the county in the event of a disaster.

Task 4: Public Involvement

The public was invited to attend a series of community meetings to review the draft mitigation strategies and actions. These were held at both the county level and in each of the individual communities covered by the plan. Public notice was given for all meetings.

3.1 STEERING COMMITTEE

A Steering Committee was created to oversee and guide the update planning process. The Committee consists of representatives from the County and Region Nine Development Commission, as the project consultant. Steering Committee members are listed in Figure 3-1 below.

Figure 3-1: Steering Committee Members

Name	Position	Representing
Dennis Dinneen	Emergency Management Director	Waseca County
Laura Elvebak	Administrator	Waseca County
Brad Milbrath	Sheriff	Waseca County
Nathan Richman	Engineer	Waseca County
Cheryl Lewer	Public Health Director	Waseca County
Jon Hammel	Staff,	Region Nine Development Commission
John Considine	Staff	Region Nine Development Commission
Isaac Kerry	Staff	Region Nine Development Commission

3.2 STAKEHOLDER TASKFORCE

A stakeholder taskforce was assembled to provide wider representation from the county and cities within Waseca County. The responsibility of the stakeholder taskforce was to provide input and information throughout the planning process.

Figure 3-2: Planning Team Members

Representing	Name	Position	Role
Waseca County	Dennis Dinneen	Emergency Management Director	Emergency Management
	Laura Elvebak	County Administrator	County Leadership
	Brad Milbrath	Sheriff	Law Enforcement
	Nathan Richman	County Engineer	Infrastructure
	Cheryl Lewer	Public Health Director	Public Health
	Mark Leiferman	Planning & Zoning Director	Development
	Judy Hiller	IT Director	Development
	Mike Pentico	Deputy Emergency Management Dir.	Emergency Management
	Lenny Hurlburt	Planning & Zoning Technician	Development
	Mike Hintz	County Commissioner	County Leadership
City of Waseca	Penny Vought	Police Chief	Law Enforcement
	Clark Fell	Public Works Director	Infrastructure
	Gary Conrath	Fire Chief	Fire / Rescue
	J. Crystal Prentice	City Manager	City Leadership
	Kim Johnson	Planning Director	Development
	Nathan Reinhardt	Finance Director	Administration
	Russ Stammer	City Engineer	Infrastructure
City of Janesville	Clinton Rogers	Administrator	City Leadership
	Mark Novak	Mayor	City Leadership
	Dave Wheelock	Public Works Director	Infrastructure
	David Ulmen	Police Chief	Law Enforcement

	Frank Zimprich	General Manager, Public Utilities	Infrastructure
	Mike Santo	City Councilor	City Leadership
	Nate Zimmerman	Line Foreman, Public Utilities	Infrastructure
	Randy Cummins	Fire Chief	Fire / Rescue
City of New Richland	Wayne Billing	City Clerk	Administration
	Jeremy Parpart	Fire Chief	Fire / Rescue
	Scott Eads	Police Chief	Law Enforcement
	Jennie Johnson	Ambulance Chief	Medical / Rescue
	Brian Svoboda	Fire Captain	Fire / Rescue
City of Waldorf	Judy Kohout	City Clerk	Administration
	Adam Groskreutz	Fire Chief	Fire / Rescue
	Bob Vogelsang	Mayor	City Leadership
Community Partners	Vicki Neidt	Mayo Clinic Health Systems, Waseca	Public Health
	Angela Storch	American Red Cross Executive Dir. – Rice Le Sueur, and Waseca Chapter	Emergency Management
Neighboring Counties	Blue Earth County	Emergency Management Director	Emergency Management
	Nicollet County	Emergency Management Director	Emergency Management
Region Nine Development Commission	Jon Hammel	Staff, Primary	Consultant
	John Considine	Staff, Secondary	Consultant
	Isaac Kerry	Staff	Consultant
	Daniel Bonnell	Staff, GIS Intern	Consultant

3.3 PUBLIC INVOLVEMENT

An effort was made to solicit public input during the planning process with meetings scheduled in 2012 as follows:

- Waseca County East Annex – July 18
- Waldorf City Hall – July 30
- Waseca City Hall – August 15
- New Richland City Hall – August 15
- Janesville City Hall – August 30

The county's risk assessment and mitigation actions were reviewed at each meeting. Comments were reviewed after the meeting for incorporation into the plan by staff attending the meeting. Appendix 9.2 contains the minutes from public meetings. Appendix 9.4 contains the advertisements of the meetings in local newspapers and other media.

3.4 COMMUNITY INVOLVEMENT

Participation by the community in the mitigation planning process has many benefits, such as:

- Expert advice on technical and program issues;

- Educate the public about hazards in the community;
- Input from the public on potential risks;
- Identify sources of funding for potential projects; and
- Develop meaningful mitigation actions supported by the community.

The planning team sought participation from various representatives of county government, local city governments, and community groups to participate. The team also sought input from neighboring counties. Participating neighboring counties and community partners are included in Figure 3-2 above.

3.5 REVIEW OF EXISTING PLANS, STUDIES, REPORTS & TECHNICAL INFORMATION

Information used in the preparation of this update was drawn from a variety of local, state, federal, and private resources, including: comprehensive plans, land use plans, emergency operations plans, etc. The existing resources used in the update process are listed in Figure 3-3 below.

Figure 3-3: Planning Documents Used in Planning Process

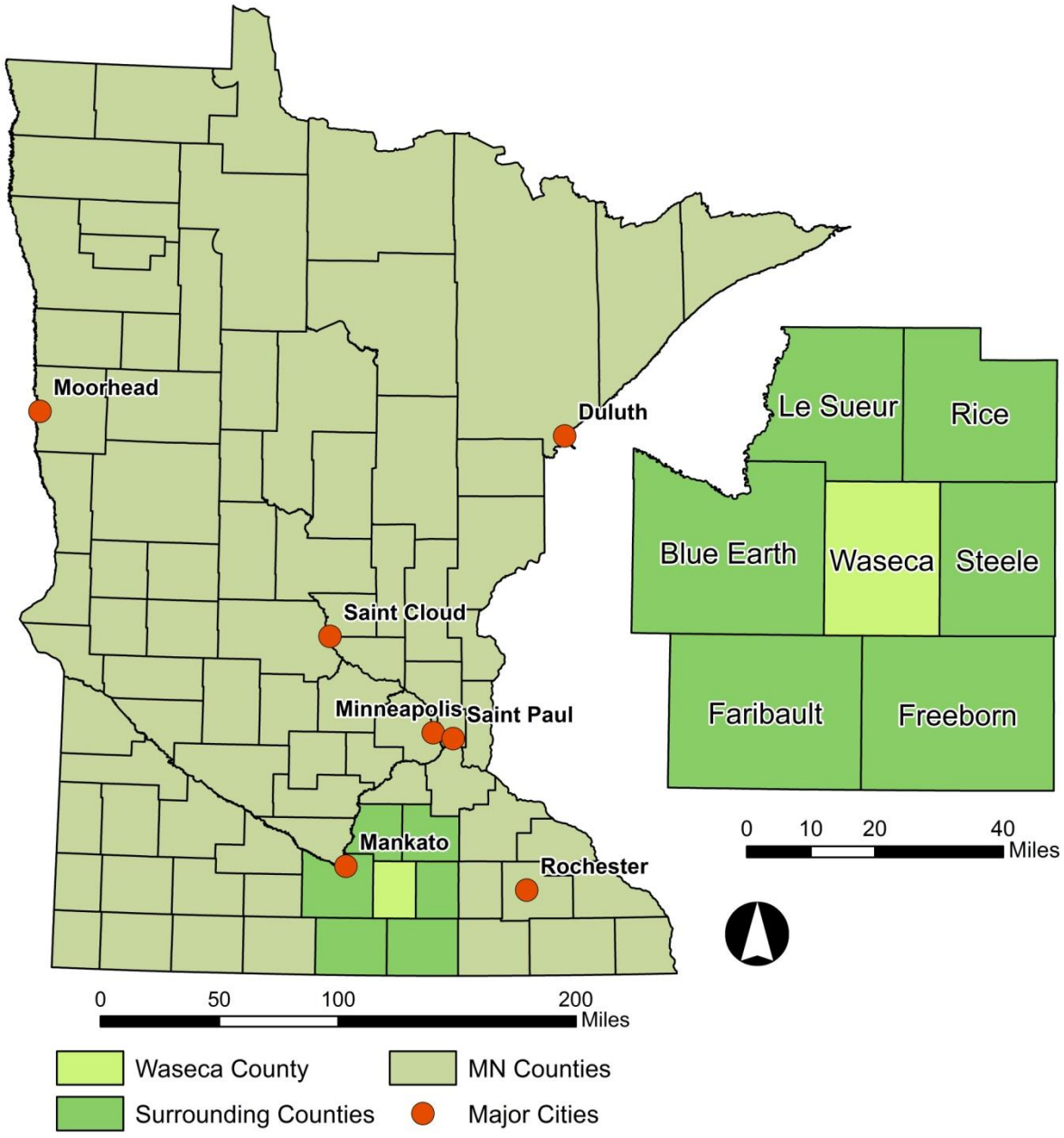
Author(s)	Year	Title	Description	Used For
City of New Richland	1999	City of New Richland Zoning Map	Provides land use information	County profile
Waseca County, Region Nine Development Commission	2005	Waseca County Comprehensive Plan	Provides community profile and land use information	County profile, hazard identification
Region Nine Development Commission	2006	City of Waldorf Land Use Plan	Provides land use information	County profile
Minnesota Division of Homeland Security and Emergency Management	2008	Minnesota State All-Hazard Mitigation Plan	Provides profile, natural resource, and hazard identification information	County profile, hazard identification, risk assessment, mitigation strategies/actions
Minnesota Division of Homeland Security and Emergency Management	2011	Minnesota State All-Hazard Mitigation Plan Update	Provides profile, natural resource, and hazard identification information	County profile, hazard identification, risk assessment, mitigation strategies/actions
Waseca County, Midwest Community Planning LLC	2008	Waseca County Comprehensive Water Plan 2009-2018	Provides natural resource and development information	County profile, hazard identification
City of Janesville	2009	City of Janesville Emergency Operations Plan	Provides hazard response and recovery information	Hazard identification, risk assessment, community capability assessment
Waseca County	2010	Waseca County Emergency Operations Plan	Provides hazard response and recovery information	Outreach; hazard identification, risk assessment, community capability assessment

4.0 COUNTY PROFILE

4.1 LOCATION

Waseca County covers a total of 432.81 square miles of territory located in south central Minnesota.[13] The county lies approximately 40 miles south of the Twin Cities metropolitan area. It is bordered to the north by the counties of Le Sueur and Rice, to the east by Steele County, to the south by the counties of Freeborn and Faribault, and to the west by Blue Earth County.

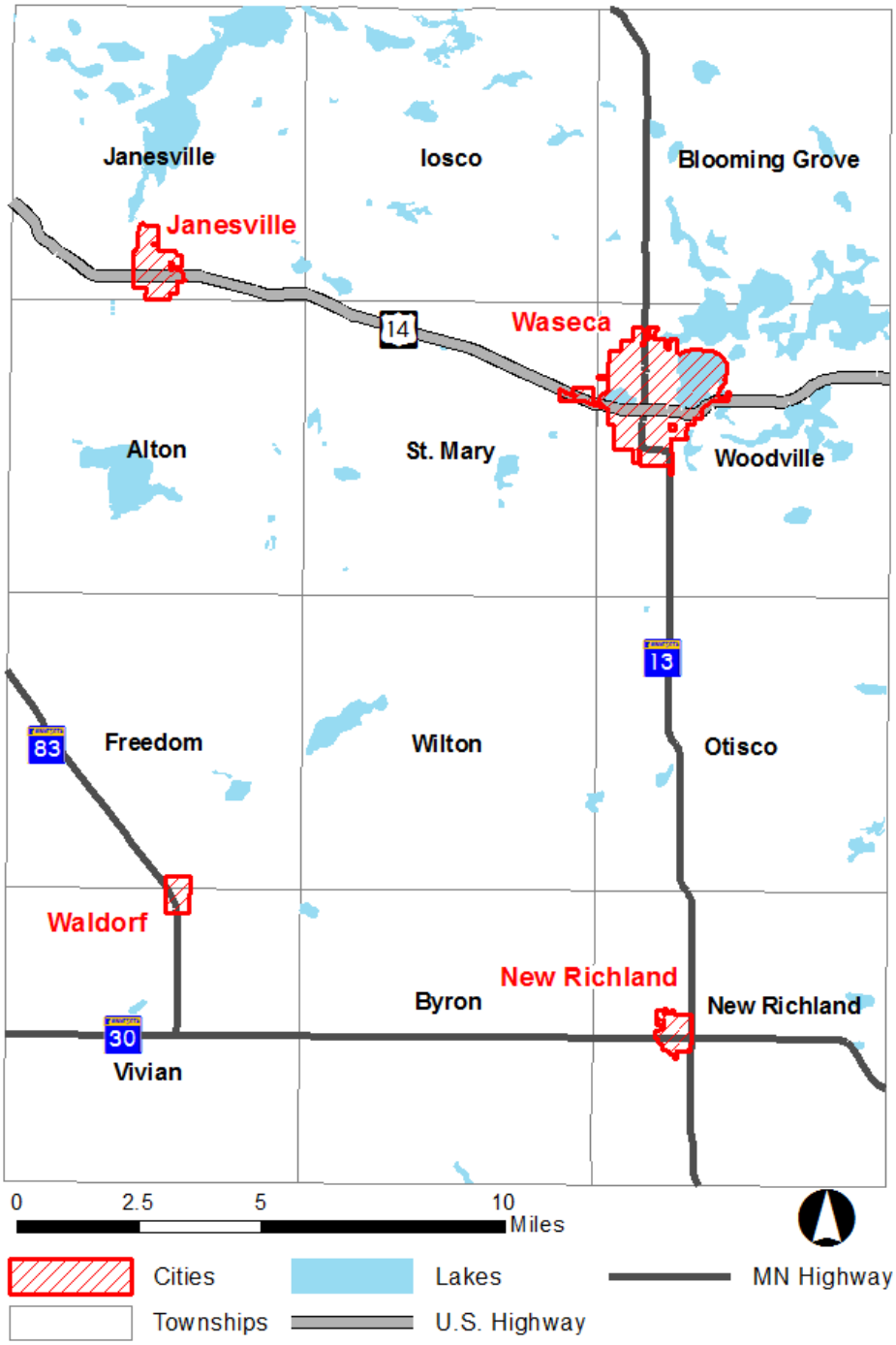
Figure 4-1: General Location Map



4.2 CITIES & TOWNSHIPS

Waseca County consists of four incorporated cities and 12 townships. The cities include: Janesville, New Richland, Waldorf, and Waseca. The City of Waseca is the largest city in Waseca County and is also the county seat. The townships include: Alton, Blooming Grove, Byron, Freedom, Iosco, Janesville, New Richland, Otisco, St. Mary, Vivian, Wilton, and Woodville.

Figure 4-2: Local Units of Government



SOURCE: MNDOT, MNDNR

4.3 LANDSCAPE

The physiographic features of Waseca County's landscape are predominantly the result of the last major advance of the North American Laurentide Ice Sheet during the Wisconsin glaciation (100,000-10,000 years ago). Approximately 14,000 years ago, the last glacier to cross the state, the Des Moines lobe, pushed south-east from the Dakotas across south-central Minnesota and into north-central Iowa. As the glacier moved south it collected sediment, which was eventually deposited across southern Minnesota. The bedrock underlying the county is covered in 70 to 350 feet of this glacial sediment.[14]

The Bemis moraine marks the terminal margin of the Des Moines lobe. While the Bemis moraine is distinct along the western and southern extent of the glacier, the eastern section is comprised of a less distinct series of recessional moraines.[15] This series of moraines is collectively known as the Owatonna moraine complex and runs southward from Jordan to Albert Lea and into Iowa.[16] The Owatonna moraine roughly parallels State Highway 13 along the eastern border of the county and varies between three and eight miles in width.[17]

Approximately 12,000 years ago, the Des Moines lobe retreated northward, leaving behind a mix of unsorted rock debris known as glacial till. The central and western areas of the county lie within the eastern portion of the Blue Earth till plain.[18] In the southwest and west-central portions of the county a thin, patchy layer of residual sediment from Glacial Lake Minnesota covers the till plain.[19] This lake formed due to the accumulation of melt water from the retreating glacier and once covered a significant area within Blue Earth, Watonwan and Faribault counties.

The topography of the county gently slopes to the south and west. The northern and eastern portions of the county are characterized flat-topped hills. The hills were formed through topographic inversion, a process where sediment on top of the glacier filled in holes in the ice. As the ice receded the debris piles remained, becoming hills. The abundant depressions and channels between the hills are occupied by bogs and marshlands.[20] Towards the center of the county the hills grade into irregular, rounded hummocks which were formed as water flowing along the ice margin undermined the ice and caused collapse and the redistribution of glacial sediment.[21] In the south-western portion of the county the hummocks give way to gentle, undulating terrain and finally flatten out into the expanse of the till plain.

The landscape is dotted with numerous lakes. Many lakes formed in irregular till depressions (lakes Buffalo, Silver, and Wheeler), while others formed in ice-block basins in the till (lakes Goose, Reed, Rice, and Elysian).[22] Ice-block basins are also known as kettle lakes, which form when massive blocks of ice break off from a retreating glacier, are surrounded by till, and melt to form a standing body of water.

4.4 HYDROLOGY[23]

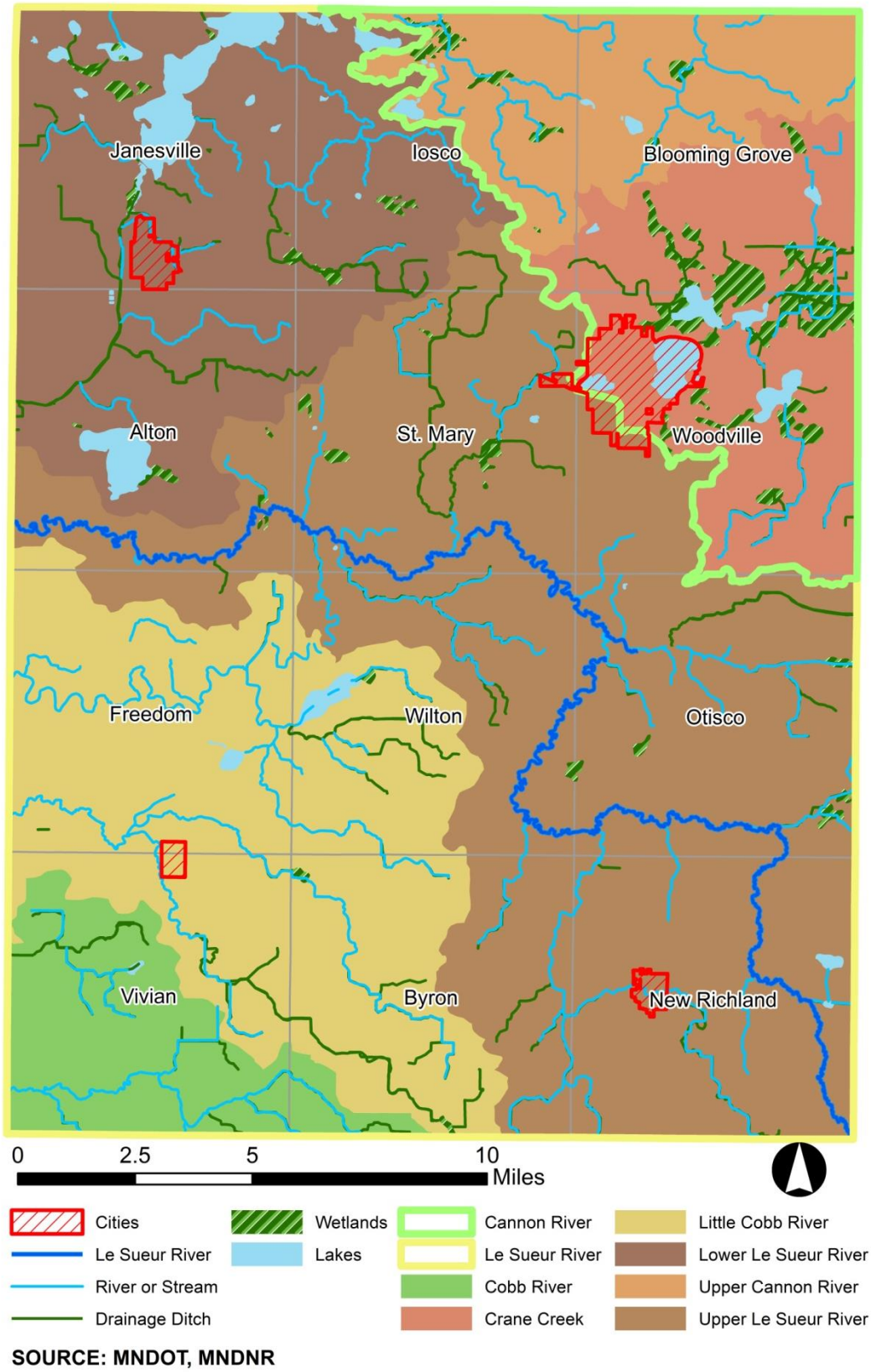
The county is part of two major watersheds. The Cannon River Watershed occupies 79 square miles in the northeastern corner of the county. The remaining 353.8 square miles fall within the Le Sueur River Watershed. The county is part of 54 minor watersheds. Within the county, the Le Sueur River Watershed is comprised of 42 minor watersheds and the Cannon River Watershed is comprised of 13 minor watersheds.

The Le Sueur River runs from the south-east area of the county to the west-central. Other rivers include the Cobb River, Little Cobb River, and Little Le Sueur River. There are also several creeks, including White Water Creek, Waterville Creek, Mackenzie Creek, Crane Creek, and Boot Creek.

The county contains 46 lakes and ponds. The majority of the lakes are located in the northern half of the county. Three of the county's lakes are over a square mile in size, including Lake Elysian (3.5 square miles), Lake Buffalo (1.3 square miles), and Clear Lake (1 square mile).

The county contains 101 wetlands, marshes, swamps and bogs. The majority of the wetlands are located in the northern half of the county, with the densest cluster located to the north and east of the City of Waseca. The county's largest wetland, Moonan Marsh, covers approximately 2.1 square miles of territory.

Figure 4-3: Hydrologic Features



SOURCE: MNDOT, MNDNR

4.5 CLIMATE[24]

Waseca's daily climatic observations occur via the Waseca Experiment Station, No. 218692, and date back to 1914. The University of Minnesota's Southern Research and Outreach Center has maintained the record since 1960. In its nearly 100 years of operation, the station has amassed one of the state's best long-term, detailed climate records.[25] This record includes data on soil temperature and drainage, solar radiation and air temperature, precipitation and evaporation, and wind. The experiment station, by means of a variety of sources, provides the bulk of the data presented in the climate overview below.

Waseca County, like the rest of Minnesota, has an extreme continental climate. The county sits in the heart of the North American land mass and lies within an area where cold, dry air from Canada battles for control of the atmosphere with warm, moist air from the Gulf of Mexico.[26] The result is a variety of extreme temperature possibilities, ranging from 106°F in May 1934 and July 1936, to -37°F in January 1924.[27] In July, daily temperatures range from the low eighties to the low sixties with an average of approximately 71°F. Daily temperatures in January range from the low twenties to the low single digits, with an average of approximately 12°F. The annual average temperature is 44°F. The typical heating season lasts from October to May and has an average of 7,987 heating degree days; annual heating degree days average 8,286.[28] Heating degree days is a measure of energy consumption associated with heating.

The growing season (with a base temperature of 32°F) lasts roughly 150 days. The last spring frost usually occurs in the first week of May and the first fall frost usually occurs in the last week of September. On average, the daily soil temperature typically reaches 50°F between April 15th and April 20th – this threshold is important because corn and soybeans cannot be planted until the soil temperature reaches 50°F and 55°F, respectively.[29] Growing degree days, the measure of temperature accumulation commonly used to assess plant development, range between 2,400 and 2,500 for a typical May-September growing season and average 2,862 annually.[30]

The county receives an average of 31 inches of precipitation annually.[31] December through February is the driest time of year; June through August is the wettest time of year. Sixty-two percent of annual average precipitation (20 inches) typically falls within the growing season (May to September).[32] The wettest year on record is 1991, with a total of 50 inches and the driest year on record is 1976, with a total of 17 inches. The record for 1-day maximum precipitation is 5.63 inches, which fell on September 23, 2010.[33] Overall, the county has seen a 26% increase in average annual precipitation since 1950, one of the largest such changes in Minnesota.[34]

The average annual snowfall for the county is 47 inches.[35] With an average of 11 inches, February is the snowiest month, followed by March (10.3 inches) and January (9.5 inches).[36] The snowiest season on record is the winter of 1983-1984 when a total 106 inches fell. The record for maximum snowfall is 15 inches, which fell on March 24, 1966.

The angle of the sun is high in the summer (shining 70% of the day), and low in the winter (shining only 51% of the day).[37] From spring to fall the prevailing wind is from the south. During the winter the prevailing wind is from the northwest. Averaging approximately 14 miles per hour, the wind speed is highest from December to April.[38]

4.6 DEMOGRAPHY[39]

According to the 2010 Census, the county had a total population of 19,136. Sixty-eight percent of the population lives in an incorporated area, or city. The remaining 32% lives in an unincorporated area, or township. During the first decade of the 21st Century, 6% of the county's population shifted from an unincorporated area to an incorporated area. This pattern is reflective of the larger national trend of generalized urbanization and rural outmigration.

Between 2000 and 2010, the county's total population decreased by 2% (390 people). The cities of Waseca, Janesville, and New Richland and Blooming Grove Township were the only local jurisdictions to witness a population increase. One local jurisdiction's population remained unchanged and the rest declined. The rate of decline varied greatly, from -1.3% in Janesville Township to -41.4% in Woodville Township.

Figure 4-4: Urban Population Change

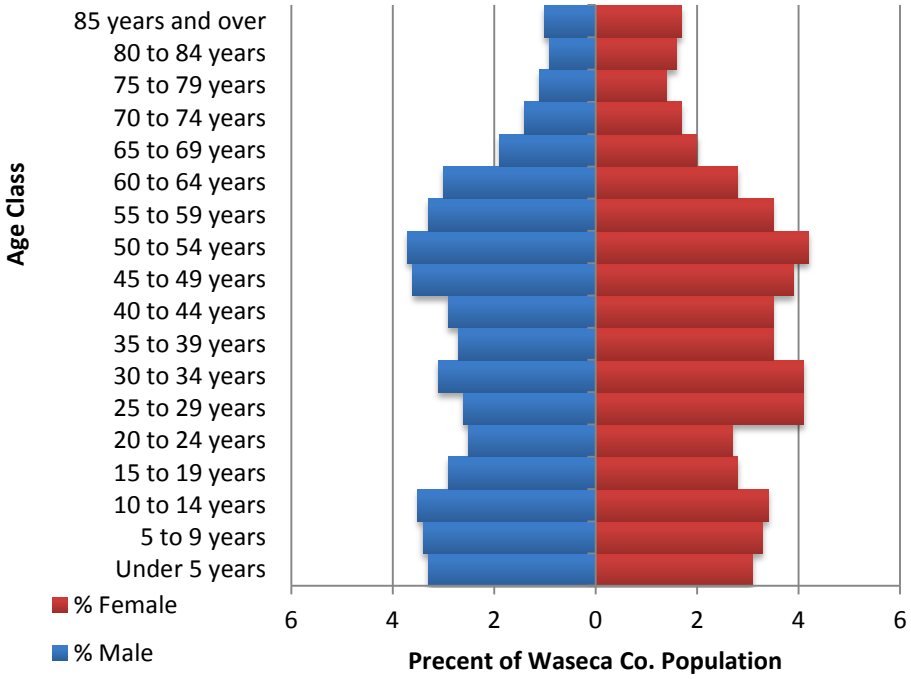
Name of Local Jurisdiction	Type of Local Jurisdiction	Population 2000	Population 2010	Population Change	% Population Change
Waseca	City	8,493	9,410	917	10.8%
Janesville	City	2,109	2,256	147	7.0%
New Richland	City	1,197	1,203	6	0.5%
Waldorf	City	242	229	-13	-5.4%
Total	***City***	***12,041***	***13,098***	***1,057***	***8.8%***

Figure 4-5: Rural Population Change

Name of Local Jurisdiction	Type of Local Jurisdiction	Population 2000	Population 2010	Population Change	% Population Change
Blooming Grove	Township	523	525	2	0.4%
Vivian	Township	259	259	0	0.0%
Janesville	Township	520	513	-7	-1.3%
Otisco	Township	629	599	-30	-4.8%
Wilton	Township	392	365	-27	-6.9%
Byron	Township	248	230	-18	-7.3%
Iosco	Township	598	550	-48	-8.0%
St. Mary	Township	504	460	-44	-8.7%
New Richland	Township	497	443	-54	-10.9%
Freedom	Township	397	326	-71	-17.9%
Alton	Township	645	434	-211	-32.7%
Woodville	Township	2,273	1,332	-941	-41.4%
Total	***Township***	***7,485***	***6,036***	***-1,449***	***-19.4%***

Overall, the county is 46.9% male and 53.1% female. The county's population pyramid, depicted below, indicates a relatively stable population. The Baby Boomer generation is present between the ages of 45 and 64. The pyramid also shows two strong demographic cohorts, one aged 25 to 34 (especially female) and the other aged 14 and under.

Figure 4-6: Population Pyramid



Ethnically, the county is predominantly White (non-Hispanic). The second largest ethnicity is Hispanic (5.1%). The county is less ethnically diverse than the state (88.6% White vs. 80.6% White) and considerably less diverse than the nation (88.6% White vs. 56.1% White).

Figure 4-7: Ethnicity

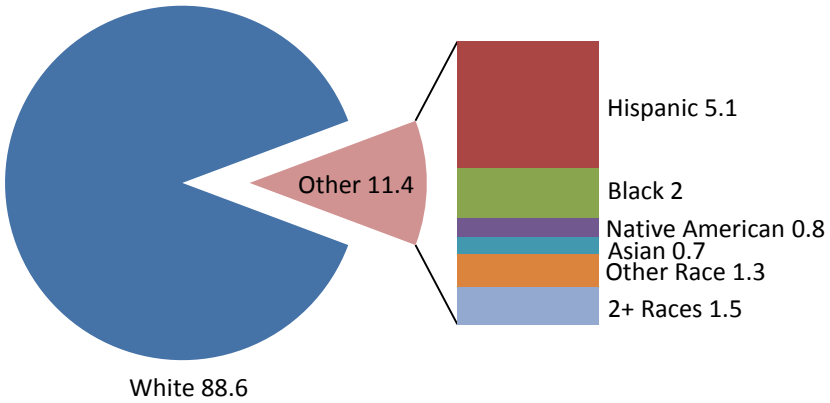
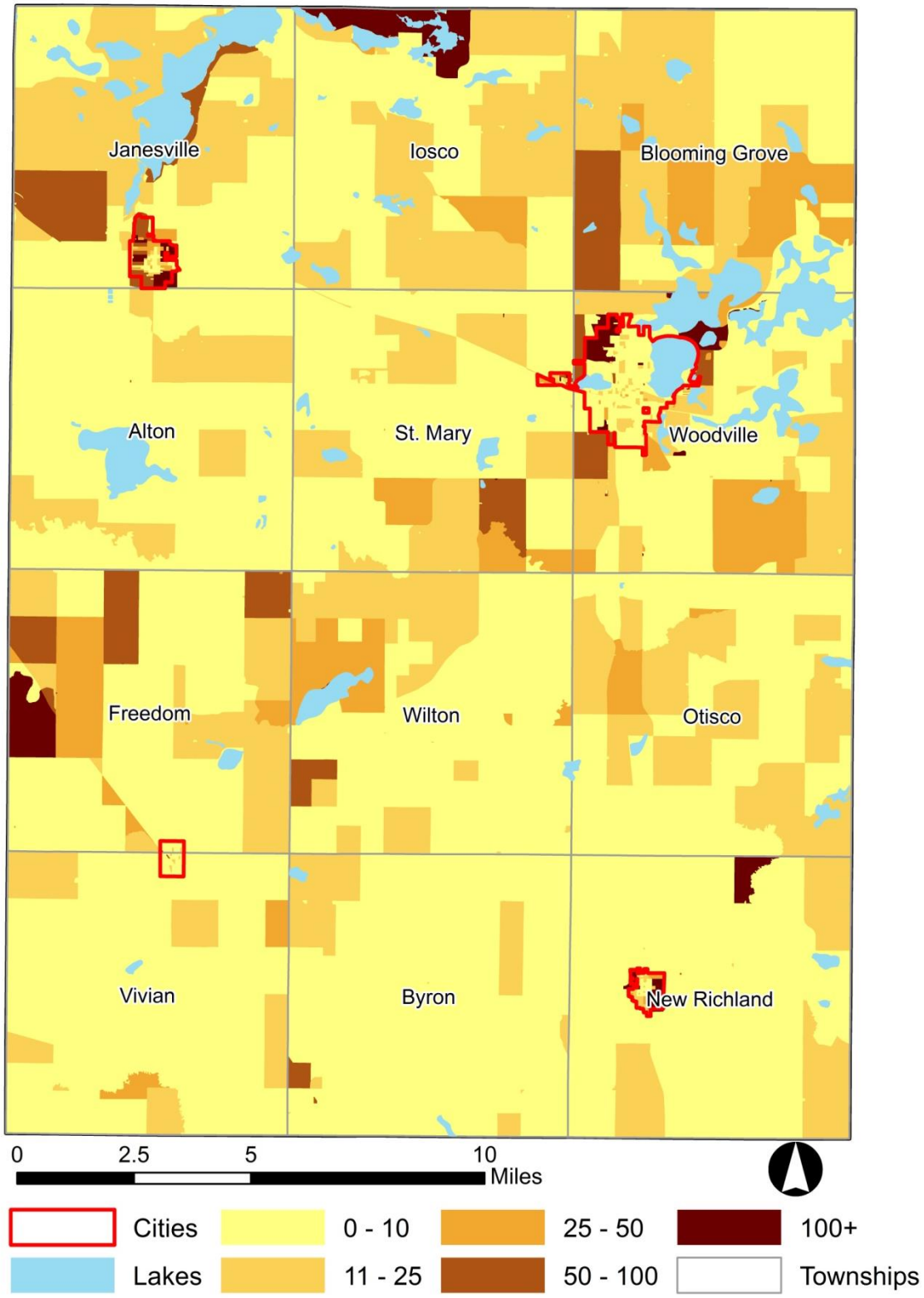
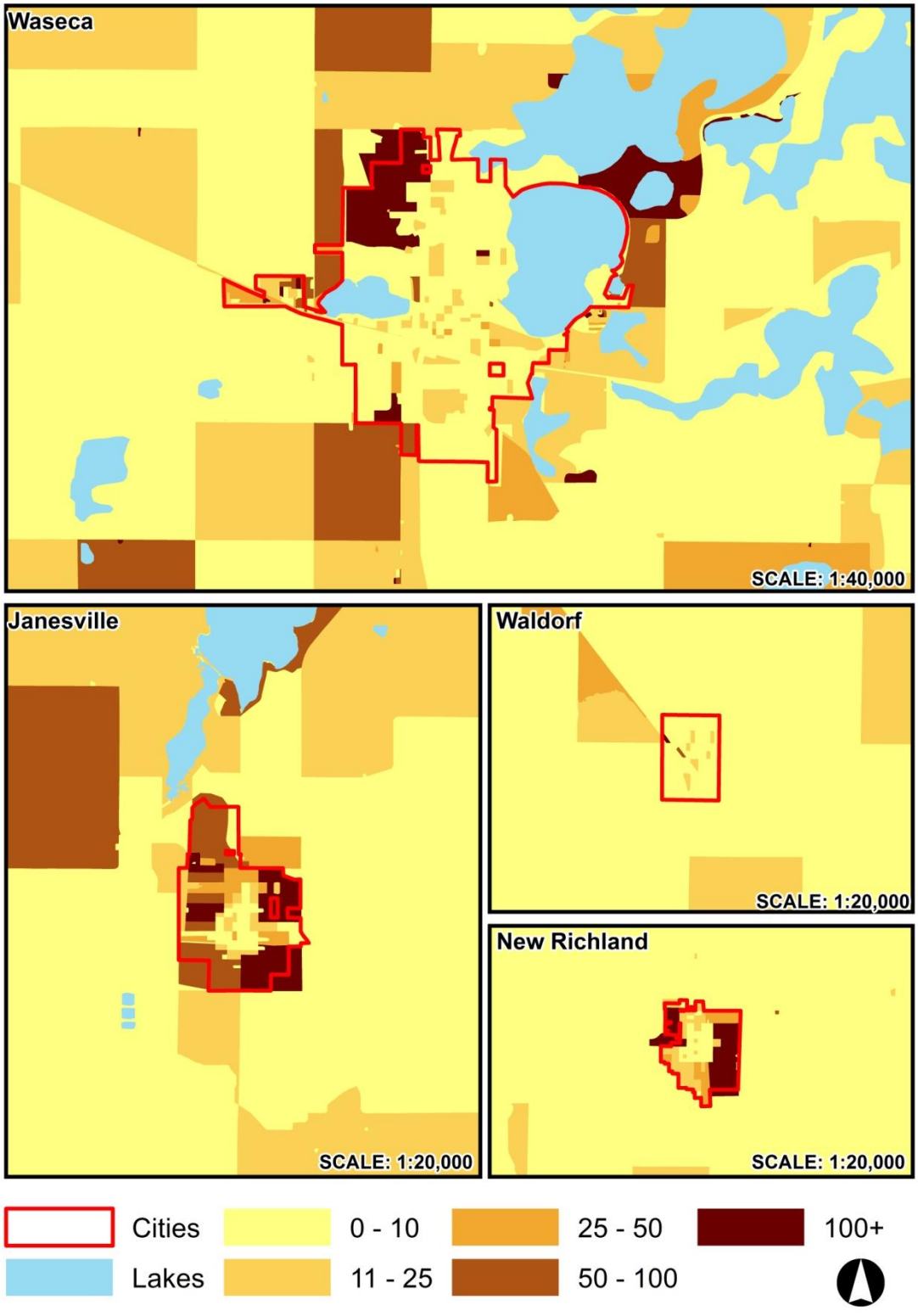


Figure 4-8: County Population Density



SOURCE: U.S. Census Bureau

Figure 4-9: Urban Population Density



SOURCE: U.S. Census Bureau
NOTES: Scale for Waseca is 1:40,000. Scale for Janesville, New Richland, and Waldorf is 1:20,000.

4.7 ECONOMY

According to the latest Economic and Agricultural Censuses, the county witnesses approximately $1.2 billion in economic activity annually.[40] The most profitable segment of the economy is manufacturing, which is responsible for over half of the county's economic activity. The next most profitable segment is agriculture, followed by retail and wholesale trade. See Figure 4-10 below.

Figure 4-10: Economic Activity

Economic Segment	Economic Activity	% of County Activity
Accommodation and food services	$14,081,000	1.2%
Administrative, support, waste management & remediation services	$10,873,000	0.9%
Agriculture	$201,810,000	16.6%
Arts, entertainment, and recreation	$2,657,000	0.2%
Educational services	$275,000	0.02%
Health care and social assistance	$53,573,000	4.4%
Information	$364,000	0.03%
Manufacturing	$634,863,000	52.2%
Other services (except public administration)	$5,969,000	0.5%
Professional, scientific, and technical services	$10,755,000	0.9%
Real estate and rental and leasing	$7,000,000	0.6%
Retail trade	$167,694,000	13.8%
Wholesale trade	$105,217,000	8.7%
Total, All Segments	**$1,215,131,000**	**100.0%**

According to the Department of Employment and Economic Development, the county had an average employment of 8,806 persons in 2010.[41] The services industry attributed the most jobs, with 2,984. The next largest industries by employment were manufacturing (1,932 jobs) and retail trade (1,154 jobs). See Figure 4-11.

Figure 4-11: Employment by Industry

Industry	Employment	% of County Workforce
Agricultural, Forestry, Fishing (SIC Range 01-09)	233	2.6%
Mining (SIC 10-14)	0	0.0%
Construction (SIC 15-17)	329	3.7%
Manufacturing (SIC 20-39)	1,932	21.9%
Transportation and Communications (SIC 40-49)	496	5.6%
Wholesale Trade (SIC 50-51)	633	7.2%
Retail Trade (SIC 52-59)	1,154	13.1%
Finance, Insurance And Real Estate (SIC 60-69)	242	2.7%
Services (SIC 70-89)	2,984	33.9%
Public Administration (SIC 90-98)	775	8.8%
Unclassified (SIC 99)	28	0.3%
Total, All Industries	**8,806**	**100.0%**

According to the Census Bureau's most recent American Community Survey, the county has a per capita income of $22,957 and a median household income of $49,971 – compared to the state's per capita income of $29,431 and median household income of $57,007.[42]

The county's unemployment rate for 2010 was 6.3% and its job growth rate was -5.1%.[43] The county poverty rate was 4.1% for families and 7.4% for individuals.[44] By comparison the state poverty rate was 6.4% for families and 10% for individuals.

4.8 LAND COVER & LAND USE

Land cover and land use are often used interchangeably. However, for the purposes of this plan land cover will be defined as the vegetation, structures, or other materials that cover the surface of the Earth. Land use will be defined as the economic/societal use of the land.

The dominant land cover for the county is cropland (80.15%). The remaining land is covered by a mixture of developed land, wetlands, pasture, grassland, water, and forest. Please see Figure 4-12.

Figure 4-12: Land Cover[45]

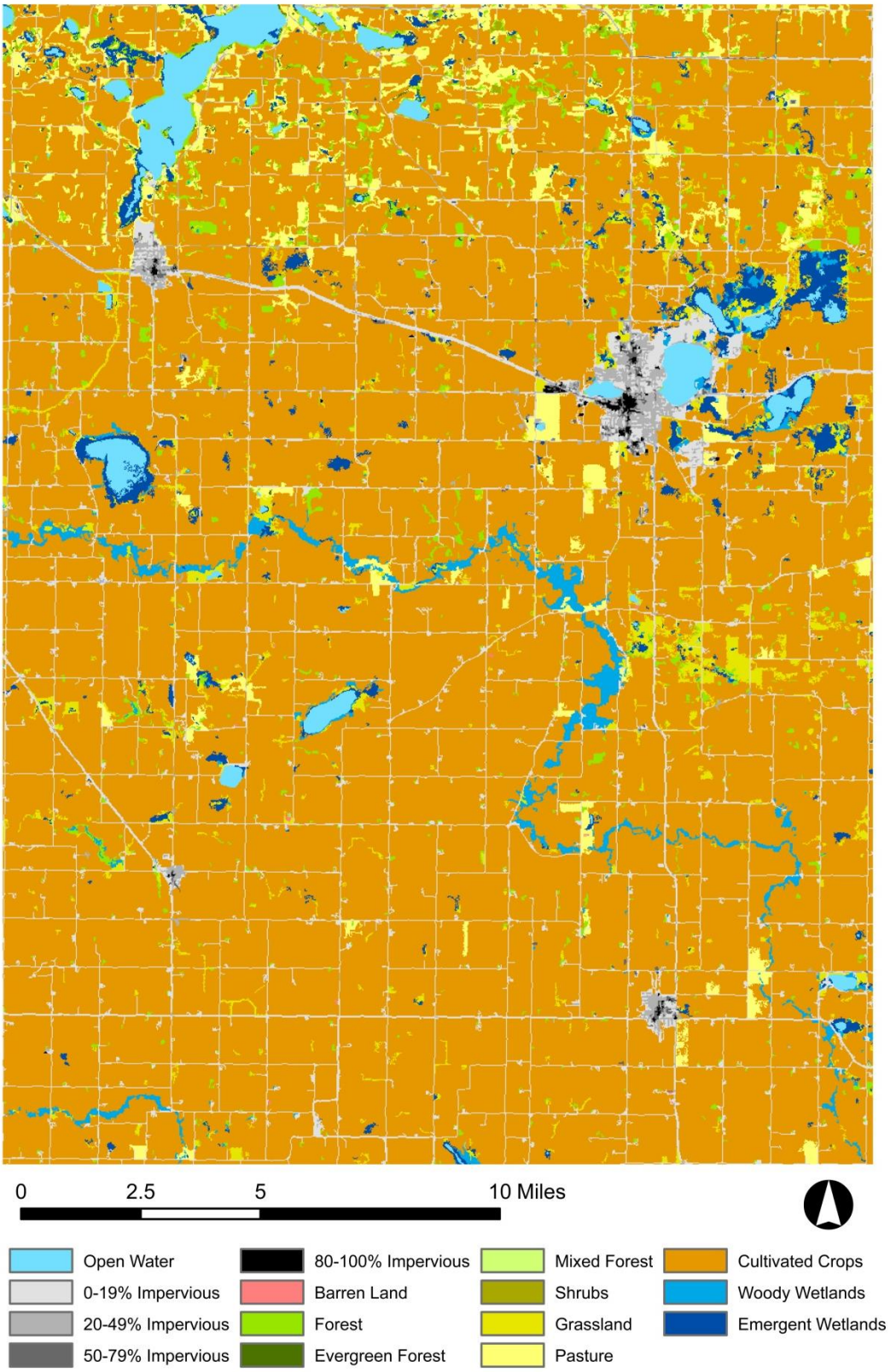
Land Cover Classification	Percent	Square Miles	Definition
Cropland	80.15%	346.9	Areas used for the production of annual crops and perennial woody crops, land being actively tilled.
Developed (Impervious)	7.06%	30.6	Areas characterized by a high percentage of constructed materials (e.g. asphalt, concrete, buildings, etc.).
Wetlands	3.33%	14.4	Areas where the soil or substrate is periodically saturated with or covered with water.
Pasture	3.16%	13.7	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle.
Grassland	2.36%	10.2	Areas characterized by natural or semi-natural herbaceous vegetation, accounting for 75% to 100% of cover, not subject to intensive management.
Water	2.02%	8.7	Areas of open water.
Forest (Deciduous, Evergreen, Mixed)	1.72%	7.5	Areas characterized by tree cover, greater than 6 meters tall, with canopy accounting for 25% to 100% of cover.
Shrubland	0.18%	0.8	Areas characterized by natural or semi-woody vegetation, generally less than 6 meters tall, with individuals or clumps not touching to interlocking.
Barren	0.02%	0.1	Areas characterized by bare rock, gravel, sand, silt, clay or other earthen material, with little or no green vegetation present.

The majority of land in the county is used for agricultural purposes (90.82%). The remaining 9.18% of county land is used for a variety of purposes, including residential, public, institutional, industrial and commercial. See Figure 4-13, below.

Figure 4-13: Existing Land Use[46]

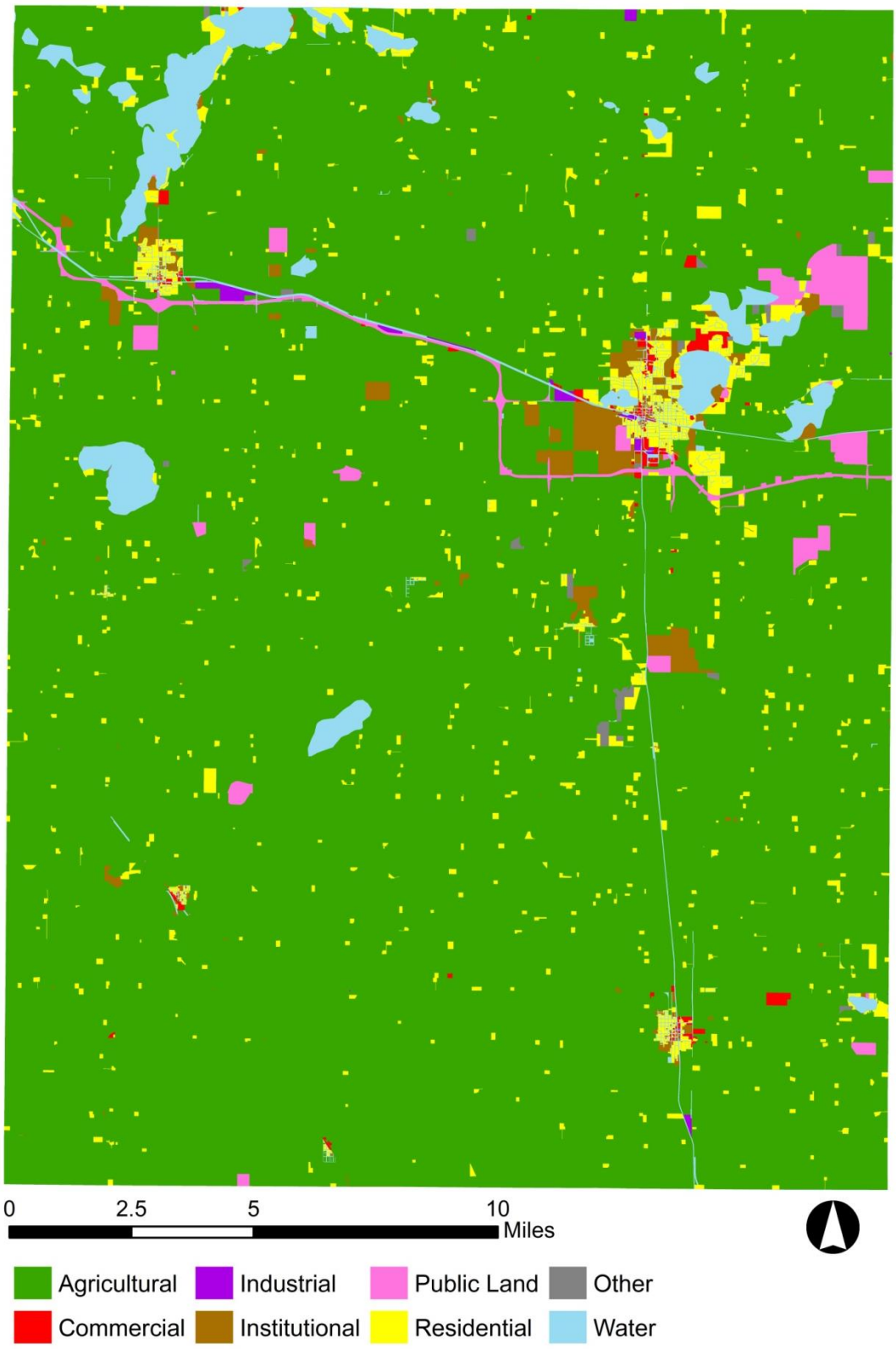
Land Use Classification	Percent	Square Miles	Definition
Agricultural	90.82%	392.4	All land zoned for agricultural use.
Residential	2.95%	12.7	All land zoned for residential use.
Open Water	1.82%	7.8	Includes all streams, rivers, and lakes not included within other established parcels.
Public	1.43%	6.2	All county, state, and federal land.
Institutional	1.26%	5.4	Includes land used for religious, nonprofit, educational, and medical purposes.
Industrial	1.26%	5.4	All land zoned for industrial use.
Commercial	0.27%	1.2	All land zoned for commercial use, including resorts and golf courses.
Other	0.20%	0.9	Includes vacant, tax forfeit, and unclassified land.

Figure 4-14: Land Cover



SOURCE: MN DNR National Land Cover Database, 2001

Figure 4-15: Existing Land Use



SOURCE: Waseca County Assessor, 2012

4.9 DEVELOPMENT TRENDS

The most recent projections released by the State Demographer indicate that the county's total population will increase over the next quarter century by approximately 1,150 people, or 5.5% - see Figure 4-16. However, this growth is projected to occur entirely within the cities of Waseca (10.8% growth) and Janesville (6.8%), and in Wilton and Woodville townships (3.8% and 9.6% respectively). The remaining portions of the county are expected to decline in population, ranging from -0.9% in Blooming Grove Township to -26.1% in Freedom Township.

Figure 4-16: Population Change 2010-2020 and 2010-2035[47]

Name of Local Jurisdiction	Type of Local Jurisdiction	Change 2010 -2020	Change 2010 -2035
Waseca	City	6.0%	10.8%
Janesville	City	4.1%	6.8%
Waldorf	City	-2.7%	-7.6%
New Richland	City	-2.7%	-8.0%
Woodville	Township	5.4%	9.6%
Wilton	Township	2.5%	3.8%
Blooming Grove	Township	0.2%	-0.9%
New Richland	Township	0.2%	-1.0%
Iosco	Township	0.0%	-1.5%
Alton	Township	-1.0%	-3.8%
St. Mary	Township	-1.0%	-3.9%
Janesville	Township	-3.1%	-9.3%
Vivian	Township	-3.4%	-10.1%
Otisco	Township	-3.3%	-10.4%
Byron	Township	-5.8%	-18.9%
Freedom	Township	-9.1%	-26.1%
TOTAL	**COUNTY**	3.4%	5.5%

The majority of land in the county is expected to remain agricultural in character. New urban development is expected to occur along the recently constructed Highway 14 bypasses of Janesville and the City of Waseca, and along the old Highway 14 corridor.[48] Commercial, industrial, and residential development is expected to the west of Janesville; primarily industrial development is expected to the east of Janesville. A mix of industrial and commercial development is expected to the west of the City of Waseca and new residential development is expected to the southeast of the city. Infill/redevelopment is expected to continue within the downtowns of both cities.

5.0 RISK ASSESSMENT

5.1 IDENTIFYING HAZARDS

5.1.1 Hazard Identification

Hazard identification is a critical component of the mitigation planning process. The 2008 county plan identified 12 hazards. In the 2013 update the original hazards were reconsidered and reorganized. The reorganization was undertaken to simplify the categorization of hazards. The changes are depicted left-to-right in Figure 5-1 below. The reorganization of the hazards for the update took into consideration several documents, including FEMA's Multi-Hazard Identification and Risk Assessment, Minnesota State 2008 All-Hazard Mitigation Plan, Minnesota State 2011 All-Hazard Mitigation Plan Update, and HSEM's River County Template. A number of other county hazard mitigation plans were reviewed as well.

Figure 5-1: Hazards 2008 Plan vs. 2013 Update

Hazards in 2008 Plan	Hazards in 2013 Update
Dam Failure	Drought
Drought	Earthquake
Extreme Temperatures	Fire (Structural & Wildfire)
Flooding	Flooding
Hazardous Materials	Hazardous Materials Release
Infectious Disease	Infectious Disease
Structural Fire	Infrastructure Failure
Summer Storms	Severe Summer Weather
Terrorism	Severe Winter Weather
Wastewater Treatment Failure / Water Supply Contamination	Tornadoes
Wildfire	Water Supply Contamination
Winter Storms	Windstorms

Changes from the 2008 plan include:

- The addition of an earthquake hazard.
- The combination of structural fire and wildfire into a single fire hazard.
- The creation of an infrastructure failure hazard category to include dam failure and wastewater treatment failure – as well as other communications, transportation, and utility failures.
- The creation of individual categories for water supply contamination, windstorms, and tornadoes.
- The elimination of the individual extreme temperature and terrorism hazard categories.

5.1.2 National Climatic Data Center Records[49]

The National Climatic Data Center provided the storm event data used in this update. It should be noted that NCDC records are estimates of damage complied by the National Weather Service from local, state, and national sources. These estimates are often preliminary in nature. The estimates may not match the final assessment of the damage related to a specific weather event.

The NCDC lists 307 reported weather events having occurred in Waseca County. The full NCDC listing is included as Appendix 9.3. The profile section of the update includes summaries of the following hazards from the NCDC listing: blizzards, extreme cold/wind chill, excessive heat, flash flood/flood, funnel cloud, hail, excessive heat, heavy rain, heavy snow, high wind, ice storm, lightning, thunderstorm, tornado, and winter storm.

5.1.3 Vulnerability Assessment Using HAZUS-MH & GIS

Hazards-United States (HAZUS) is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes.[50] For this planning process HAZUS was not utilized for earthquakes (due to the very low probability of occurrence) or for hurricanes (due to geographic location). The vulnerability analysis for flooding relied on a 2011 study done by the University of Minnesota Duluth. This study did utilize HAZUS for the flood analysis.

A geographic information system (GIS) analysis was utilized for those hazards that affected a specific geography within the county; hazards that affected the county as a whole were not analyzed using GIS. The hazards that were analyzed include: fire, flooding, hazardous material release, infrastructure failure, and water supply contamination. The analysis compared the location of critical facilities and structures to the defined hazard geographies. This allowed for the planning team to estimate the number, type and value of facilities and structures impacted by each hazard. The hazard profiles contain maps and tables depicting analysis results.

5.2 VULNERABILITY ASSESSMENT[51]

The vulnerability assessment includes an inventory of critical facilities within the county, and areas of special consideration. Critical facilities are broken into five categories: essential facilities, transportation systems, lifeline utilities, high potential loss facilities, and hazardous material facilities. Special considerations include: economic elements; historic, cultural, and natural resource areas; vulnerable populations; and special considerations. The inventory includes facility type and location. Where possible an estimated replacement value was also included. Replacement values were determined using a combination of county assessor records and data provided by individual cities.

The vulnerability assessment also includes an estimate of the county's total building exposure (public and private). Building exposure includes the number of buildings/structures in the county, along with an estimate of their estimated improved value.

5.2.1 Critical Facilities

5.2.1.A. Essential Facilities[52] [53]

Essential facilities are vital to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include: medical facilities (hospitals and clinics), police and fire stations, emergency operations centers, and schools. As part of the update process, a total of 21 essential facilities were identified in Waseca County, including: four police stations, four fire stations, three medical facilities, and ten schools. Figures 5-2 through 5-5 list these individual essential facilities, their location, and estimated replacement values, as determined by the County Assessor's Office using the most recent data available.

Figure 5-2: Essential Facilities – Law Enforcement

Facility	Location	Replacement Value
Janesville Police Station	101 N. Mott St. Janesville	$295,200
New Richland Police Station	203 N. Broadway Ave. New Richland	$343,100
Waseca Police Station (Emergency Operations Center)	508 S. State St. Waseca	$1,850,000
Waseca County Sherriff's Department (Emergency Operations Center)	122 3rd Ave. Waseca	$3,226,100

Figure 5-3: Essential Facilities – Emergency Response

Facility	Location	Replacement Value
Janesville Fire Station	219 N. Main St. Janesville	$170,000
New Richland Fire Station	205 N. Broadway Ave. New Richland	$140,900
Waldorf Fire Station	119 S. Main St. Waldorf	$157,200
Waseca Fire Station	177 2nd Ave. SE Waseca	$1,097,800

Figure 5-4: Essential Facilities – Medical Care

Facility	Location	Replacement Value
Mayo Clinic Health System in Janesville	312 N. Main St. Janesville	$63,200
Mayo Clinic Health System in New Richland	318 1st St. SW New Richland	$109,300
Mayo Clinic Health System in Waseca	501 N. State St. Waseca	$6,798,500

Figure 5-5: Essential Facilities – Schools

Facility	Location	Replacement Value
Janesville-Waldorf-Pemberton Elementary School	405 N. Main St. Janesville	$13,201,100
Janesville-Waldorf-Pemberton High School	110 E. 3rd St. Janesville	
Trinity Lutheran School	412 N. Main St. Janesville	$1,080,000
New Richland-Hartland-Ellendale-Geneva High School	306 Ash St. New Richland	$10,137,300
Hartley Elementary School	605 7th St. NE Waseca	$4,000,000
Central Intermediate School	501 Elm Ave. E. Waseca	$12,000,000
Waseca Junior High School	400 19th Ave. NW Waseca	$10,000,000
Waseca Senior High School	1717 2nd St. NW Waseca	$14,000,000
Sacred Heart Elementary	111 4th St. NW Waseca	$2,000,000
Team Academy Charter School	220 17th Ave. NE Waseca	N/A

5.2.1.B. Transportation Systems

Transportation systems are essential to the social and economic needs of our society. These systems also play a critical role in the response to and recovery from hazard events. Essential transportation systems include: airway, highway, railway, and waterway facilities and infrastructure. Figure 5-6 summarizes the transportation systems identified through the update process.

Figure 5-6: Transportation Systems

Type	Description	Replacement Value
Airway	1 Airport (regional, owned by City of Waseca).	$15,000,000
Highway	870 miles of paved roadways; including 32 miles of U.S. Highway, 53 miles of State Highway and 251 miles of County-State Aid Highway.	N/A
Railway	44 miles of railroad.	N/A
Waterway	None.	N/A

Bridges

There are a total of 87 bridges in Waseca County. According to the Federal Highway Administration, nine of these bridges are structurally deficient.[54] The classification "Structurally Deficient" is used to determine eligibility for federal bridge replacement and rehabilitation funding.[55] Bridges that are deemed to be structurally deficient are not necessarily unsafe. A structurally deficient bridge typically needs maintenance, repair, and eventual rehabilitation or replacement to address deficiencies. To remain open to traffic, structurally deficient bridges are often posted with reduced weight limits that restrict the gross weight of vehicles using the bridges. If unsafe conditions are identified during a physical inspection, the structure will be closed.

5.2.1.C. Lifeline Utility Systems

Lifeline utility systems are essential for the provision of basic services, such as heat, power, and potable water. These systems include the facilities and infrastructure related to: electric power, potable water, wastewater/stormwater, natural gas, and oil. Figures 5-7 through 5-11 list the number and type of lifeline utility systems identified through the update process.

Figure 5-7: Lifeline Utility Systems – Electric Power

Owner	Description	Location	Replacement Value
City of Janesville	Power Plant	219 N. Main St. Janesville	$5,200,000
Great River Energy	Substation	Matawan	N/A
	Substation	St. Olaf	N/A
Southern Minnesota Municipal Power Association	Substation	Loon Lake	N/A
	Substation	Waseca	N/A
Xcel	Substation	Meriden	N/A

Figure 5-8: Lifeline Utility Systems – Potable Water

Owner	Description	Location	Replacement Value
City of Janesville	Water Tower	205 E. Front St. Janesville	$708,700
	Well	809 N. Main St. Janesville	N/A
City of New Richland	Water Tower	114 1st St. SE New Richland	$718,181
	Water Treatment Facility and Well No. 1	235 N. Broadway Ave. New Richland	$664,575
	Wells No. 2 and 3	231 N. Broadway Ave. New Richland	$16,105
City of Waldorf	Water Treatment Facility	211 S. Main St. Waldorf	$2,000,000
	Well	211 S. Main St. Waldorf	$150,000
City of Waseca	Well No. 1	507 2nd St. SW Waseca	$1,500,000
	Well No. 2	721 5th Ave. SW Waseca	$1,500,000
	Well No. 3	611 5th Ave. SW Waseca	$1,500,000
	Well No. 5	100 19th Ave. NW Waseca	$1,500,000
	Well No. 6	Maplewood Park	$500,000

Figure 5-9: Lifeline Utility Systems – Wastewater/Stormwater

Owner	Description	Location	Replacement Value
City of Janesville	Lift Station	Intersection of West St. and First St. Janesville	$5,000
	Lift Station	511 ½ Allyn Cir. Janesville	$98,700
	Lift Station	508 Cedar St. Janesville	N/A
	Lift Station	522 ½ Oakwood Dr. Janesville	N/A
	Wastewater Treatment Facility	West of Janesville, along County Road 55.	$199,300
City of New Richland	Lift Station	217 3rd St. NE New Richland	N/A
	Lift Station	716 N. Elm Ave. New Richland	N/A
	Wastewater Treatment Facility	601 W. Division St. New Richland	$1,557,066
City of Waldorf	Wastewater Treatment Facility	North of Blashack St.	$2,000,000
City of Waseca	Lift Pump	8th Ave. NE Waseca (Clear Lake Park)	$30,000
	Lift Station	916 11th Ave. NW Waseca	$1,500,000
	Lift Station	11th Ave. SE Waseca (1200 Block)	$600,000
	Lift Station	125 13th Ave. NE Waseca	$600,000
	Lift Station	2501 6th St. NE Waseca	$400,000
	Lift Station	6th Ave. NE Waseca	$600,000
	Lift Station	7th Ave. NW Waseca	$600,000
	Lift Station	1113 E. Elm Ave. Waseca	$600,000
	Lift Station	801 8th St. NE Waseca (Fairgrounds)	$1,000,000
	Lift Station	1224 E. Elm Ave. Waseca (Hwy. 14 E.)	$60,000
	Lift Station	14360 Hwy. 14 E. Waseca	$400,000
	Lift Station	400 University Ave. Waseca (South City Limits)	$800,000
	Wastewater Treatment Facility	35408 110th St. Waseca	$40,000,000

Figure 5-10: Lifeline Utility Systems – Natural Gas[56]

Owner	Description	Location	Replacement Value
Dome Pipeline Company	Natural Gas Pipeline	Diagonal between S30 T107N R24W and S32T105N R22W	N/A
Northern Natural Gas Company	Natural Gas Pipeline	Diagonal between S31 T108N R24W and S24 T107N R22W	N/A
	Natural Gas Pipeline	Horizontal between S21 T105N R22W and S24 T205N R22W	N/A

Figure 5-11: Lifeline Utility Systems – Oil[57]

Owner	Description	Location	Replacement Value
William Brothers Pipeline Company	Crude Oil Pipeline	Diagonal between S18 T106N R24W and S36 T105N R24W	N/A

5.2.1.D. High Potential Loss Facilities

High potential loss facilities are those facilities that would have a potentially high loss associated with them in the event of a hazard event. Examples of these systems include: dams, military installations, and nuclear power plants.

Figure 5-12 summarizes the dams located in the county. Replacement values for dams were not available.

Figure 5-12: Dams[58]

Dam Name	Owner	Type	Location	Max Storage (Acre Feet)
Buffalo Lake	MN DNR*	Earth, Gravity	S16 T107N R24W	6,200
Clear Lake	MN DNR – Wildlife	Concrete	S09 T107N R22W	N/A
Elysian Lake	MN DNR – Wildlife	Gravity, Earth	S21 T108N R24W	19,020
Goose Lake	MN DNR	N/A	S11 T107N R22W	N/A
Janesville Wildlife	MN DNR	Earth	S28 T108N R24W	2,432
Moonan Marsh	Waseca County	Earth, Gravity	S36 T108N R22W	150
Reeds Lake	MN DNR	N/A	S05 T108N R23W	N/A
Silver Lake	MN DNR	Gravity, Earth	S19 T106N R23W	2,293
St. Olaf Lake	MN DNR	N/A	S13 T105N R22W	1,494
Watkins Lake	MN DNR – Waters	Gravity	S02 T107N R22W	2,000
Willis Lake	MN DNR	N/A	S09 T108N R24W	N/A

* Minnesota Department of Natural Resources

Figure 5-13 lists the other high potential loss facilities identified through the update process, including individual facility type, location, and replacement value.

Figure 5-13: High Potential Loss Facilities

Facilities Name	Facility Type	Location	Replacement Value
Guardian Energy LLC	Ethanol Plant	4745 380th Ave. Janesville	N/A
Waseca Federal Correctional Institution	Prison	320 1st St. NW Waseca	$12,120,000
University of Minnesota Southern Research and Outreach Center	State University Experiment Station	25838 120th St. Waseca	$2,024,200

5.2.1.E. Hazardous Material Facilities

Hazardous material facilities contain substances that are toxic and which pose a threat to human safety and the environment. These hazardous materials include: corrosives, explosives, flammable materials, radioactive materials, and toxins. The Minnesota Pollution Control Agency (MPCA) keeps a database of potentially contaminated sites and sites where pollution control permits have been issued. Figure 5-14 below depicts MPCA data for Waseca County, including active and inactive sites. The MPCA includes a total of 825 sites; 530 that are active and 295 that are inactive.

Figure 5-14: MPCA Contaminated Sites and Environmental Permits[59]

Activity	Description	Active	Inactive
Air Permit	Issued for businesses that create air pollutants typically generated through industrial activities. For example: fine particles, ozone, mercury, etc.	1	1
Construction Stormwater Permit	Issued to construction site owners/operators. Designed to prevent polluted stormwater from reaching lakes, streams and wetlands.	52	51
Construction Stormwater Site Subdivision	Sites where a construction project with an existing stormwater permit has been subdivided into smaller parcels.	2	0
Feedlot	Sites where animals are confined for feeding, breeding, or holding. Ranges from small farms to large-scale commercial livestock operations.	330	55
Hazardous Waste (Small to Minimal Quantity Generator)	Generates less than 2,200 pounds of hazardous waste, or 2.2 pounds of acutely hazardous waste, per calendar month.	47	72
Industrial Stormwater Permit	Issued to industrial site owner/operators. Designed to prevent polluted stormwater from reaching lakes, streams and wetlands. Pollutants may include: toxic metals, oil, grease, de-icing salts, etc.	5	11
Landfill, Permitted By Rule	Landfills that have a small capacity and/or operate for a short period of time that are not required to obtain an individual solid waste permit. For example: yard waste composting facilities, recycling facilities, and energy recovery facilities.	3	0
Leak Site	Locations where a release of petroleum products has occurred from a tank system.	4	37
Multiple Activities	Sites where there are multiple MPCA activities occurring.	58	29
Tank Site	Sites with a storage tank on the premises. For example: gas stations, bus & trucking companies, factories that process sugar beets, ethanol, pulp, paper, or chemicals, etc.	25	28
Unpermitted Dump Site	Landfills that never held a valid MPCA permit. Generally these dumps existed prior to permitting requirements (pre-1967) and were old farm/municipal disposal sites.	0	6
Voluntary Investigation & Cleanup (VIC) Site	Non-petroleum brownfield sites that are part of the VIC technical assistance program.	0	3
Wastewater Discharger	Facilities that generates or treats wastewater for discharge onto land or into water. Includes: sewage treatment plants and some manufacturers.	3	2

5.2.2 Special Considerations

5.2.2.A. Economic Elements

Economic elements are the facilities that impact the welfare and stability of the local and/or regional economy. These elements include major employers and financial institutions. Figures 5-15 and 5-16 list the number and type of economic elements identified through the update process.

Figure 5-15: Financial Institutions[60]

Name	Location
Diversified Credit Union	299 Johnson Ave. SW Waseca
Janesville State Bank	201 N. Main St. Janesville
Roundbank	200 2nd St. NE Waseca
Roundbank	102 S. Main St. Waldorf
State Bank of New Richland	103 N. Broadway Ave. New Richland
First National Bank of Waseca	101 N. State St. Waseca
United Prairie Bank	1509 N. State St. Waseca
Wells Fargo	220 Elm Ave. E. Waseca

Figure 5-16: Major Employers[61]

Name	Location	Employee Estimate
Brown Printing	2300 Brown Ave. Waseca	> 1,000
Emerson Network Power	299 Johnson Ave. SW Waseca	500-999
Bird's Eye	400 4th St. SW Waseca	250-499
Delta-Waseca	1400 2nd St. SE Waseca	250-499
Bird's Eye Foods-Farm Shop	11393 350th Ave. Waseca	100-249
Hy-Vee	1230 State St. N. Waseca	100-249
Lake Shore Inn Nursing Home	108 8th St. NW Waseca	100-249
U.S. Federal Correctional Institute	1000 University Dr. SW Waseca	100-249
Wal-Mart Supercenter	2103 State St. N. Waseca	100-249
Waseca Central Intermediate School	501 Elm Ave. E. Waseca	100-249
Waseca Medical Center, Clinic	501 State St. N. Waseca	100-249
Waseca Medical Center, Hospital	501 State St. N. Waseca	100-249
Winegar	1209 State St. S. Waseca	100-249
New Richland Care Center	312 1st St. NE New Richland	100-249

5.2.2.B. Historical, Cultural & Natural Resource Areas

Community elements in this category are important for their historical and/or cultural significance and natural resources. There are a variety of parks within the county. These facilities are summarized in Figure 5-17.

Figure 5-17: Historical, Cultural & Natural Resource Areas

Owner	Park Name	Location	Replacement Value
Waseca County	Blowers	Section 2, Woodville Township	$53,900
	Courthouse	Section 36, St. Mary's Township; Section 1, Wilton Township	$163,300
	Eustice	Section 33, Freedom Township	$15,000
	Okaman	Section 1, Janesville Township	$5,100
City of Janesville	Lakeview	403th Ave. Janesville	$219,100
	North Street	W. North St. Janesville (500 Block)	$56,400
	Veterans Memorial	W. 1st St. Janesville (200 Block)	$139,000
City of New Richland	Central Park	201 S. Broadway New Richland	N/A
	Legion Field	324 3rd St. NE New Richland	N/A
City of Waldorf	Waldorf City Park	229 E. 1st St. Waldorf	$75,000
City of Waseca	Clear Lake	1000 8th Ave. NE Waseca	$1,500,000
	Community Field	Adjacent to Hartley Elementary School (605 7th St. NE Waseca)	$500,000
	Emerson	905 E. Elm Ave. Waseca	$50,000
	Loon Lake	815 7th Ave. NW Waseca	$300,000
	Loon Lake Access	W. Elm Ave. Waseca (1100 Block)	$80,000
	Maplewood	36047 Clear Lake Dr. Waseca	$1,200,000
	Memorial	1400 E. Elm Ave. Waseca	$500,000
	Nature Area	Adjacent to Northwest Park (1217 4th St. NW Waseca)	$100,000
	Northeast	201 22nd Ave. NE Waseca	$1,000,000
	Northwest	1217 4th St. NW Waseca	$200,000
	Oak Park	527 6th Ave. SE Waseca	$400,000
	Southview	1206 7th St. SE Waseca	$200,000
	Sportsman	37401 Clear Lake Dr. Waseca	$100,000
	Tink Larson	618 4th St. NE Waseca	$1,000,000
	Trowbridge	409 2nd St. NE Waseca	$800,000
	University	921 5th St. SW Waseca	$500,000
	Veterans	601 3rd St. SW Waseca	$50,000
	Waseca Water Park	200 26th Ave. NE Waseca	$3,000,000

There are ten structures within the county that are listed on the National Register of Historic Places. These structures and their addresses are listed in Figure 5-18.

Figure 5-18: Historic Structures[62]

Name	Address
Armstrong, W. J., Company Wholesale Grocers	202 2nd St. SW Waseca
Aughenbaugh, John W., House	831 3rd Ave. NE Waseca
Bailey, Philo C., House	401 2nd Ave. NE Waseca
Janesville Free Public Library	102 W. 2nd St. Janesville
Seha Sorghum Mill	Co. Hwy. 5 Janesville
Strangers Refuge Lodge Number 74, IOOF	119 S. Broadway Ave. New Richland
Vista Lutheran Church	MN 13 New Richland
Ward, Roscoe P., House	804 E. Elm Ave. Waseca
Waseca County Courthouse	307 N. State St. Waseca
Wolf, William R., House	522 2nd Ave. NE Waseca

5.2.2.C. Vulnerable Populations

Vulnerable populations are those citizens and residents that may require special assistance after a hazard event. These populations include children, the elderly, hospitalized persons, and non-English speaking persons. Figure 5-19 lists the number and type of vulnerable populations identified through the update process.

Figure 5-19: Vulnerable Populations[63]

Population Type	Population Number	Percent of Total Population
Children	4,905	25.7%
Elderly	2,819	14.7%
Hospitalized*[64]	Up to 35	N/A
Non-English Speaking**[65]	423	2.3%

* Total number of beds available at Mayo Clinic Health System in Waseca.
** Refers to those categorized by the U.S. Census Bureau as able to speak English "less than well".

There are currently three nursing homes and three assisted living facilities in the county. These facilities are listed in Figures 5-20 and 5-21 below.

Figure 5-20: Nursing Homes[66]

Facility Name	Number of Beds	Location	Replacement Value
Janesville Nursing Home	45	102 E. North St. Janesville	$766,700
Lake Shore Inn	65	108 8th St. NW Waseca	N/A
New Richland Care Center	50	312 1st St. NE New Richland	$898,500

Figure 5-21: Assisted Living Facilities[67]

Facility Name	Location	Replacement Value
Colony Court	200 22nd Ave. NE Waseca	N/A
Country Neighbors	113 1st St. SW New Richland	N/A
Latham Place	105 NW 8th St. Waseca	N/A

5.2.3 Replacement Costs

Data from the Waseca County Assessor's Office indicates that there are 11,447 property parcels in the county. Of this total, 7,693 parcels are improved. The estimated market value of all land, improved and unimproved, is slightly greater than $2.4 billion. A breakdown of the property parcels and their estimated market values is provided in Figure 5-22 below.

Figure 5-22: Parcel Data

Total Parcels	11,447
Parcels with Improvements	7,693
Parcels without Improvements	3,754
Total EMV of Parcels	$2,445,579,700
EMV* of Land Only	$1,433,081,900
EMV of Buildings Only	$1,006,079,900
EMV of Machine Only**	$6,417,900

*Estimated Market Value

** Machine values are improvements associated with utilities

The Assessor's Office had no readily available data depicting the number of buildings within the county. An estimate of building exposure by general occupancy was calculated using a combination of LiDAR data from the State of Minnesota, GIS parcel data from the Waseca County Planning and Zoning Department, and parcel data from the Assessor's Office. The total building exposure in Figure 5-23 is different than in Figure 5-22 because not all structures were successfully identified in the LiDAR data.

Figure 5-23: Building Exposure

General Occupancy	Estimated Buildings	Estimated Building Exposure
Agricultural	5,309	$140,724,000
Commercial	446	$48,189,300
Industrial	94	$46,543,700
Institutional	298	$142,936,100
Public Land	44	$13,758,700
Residential	7,855	$559,752,200
Other	6	$708,700
Total	**14,052**	**$952,612,700**

5.2.4 Future Assets & Infrastructure

Waseca County and the participating cities will continue to utilize their respective governing policy and planning documents in order to mitigate the impact of hazards on future assets and infrastructure. State governing agencies, such as the Minnesota Department of Health, Minnesota Department of Transportation, and the Minnesota Department of Natural Resources will be contacted when appropriate.

As part of the development review process, future assets and infrastructure will be evaluated for the hazards identified in this plan in the context of the hazard's geographic location. Hazards which have no specific geographic location, as identified in the hazard profile sections of this document will not be considered. All future assets and infrastructure will be evaluated for flooding concerns as appropriate on a case by case basis.

5.2.5 Land Uses & Development Trends

The geographic location of hazards, as identified in the hazard profile sections, will be considered for future land use and development trends. Content from the Waseca County Hazard Mitigation Plan will be incorporated into local governing policy and planning documents as appropriate. If the local governing policy and planning documents incorporate content from this plan, the impact of hazards on land use and development should be mitigated.

5.3 HAZARD PROFILES

5.3.1 Drought

5.3.1.A. Definition & Background

A drought is a complex natural hazard typically defined as a prolonged period of uncharacteristically dry weather that is severe enough to cause a serious hydrologic imbalance.[68] Droughts can be problematic to define precisely because what constitutes a deficiency in precipitation varies from region to region – drought conditions in Minnesota are very different from drought conditions in Texas. Long term regional norms in precipitation, temperature, soil moisture, streamflow and lake levels, and water consumption are compared to recent measurements in an attempt to identify and predict droughts. Additionally, the onset and termination of drought conditions can be difficult to pinpoint. Weather events like tornadoes and blizzards occur over a period of hours or days. However, a drought can last from several weeks to several decades.[69]

The severity of a drought can differ wildly depending on duration, location, and intensity. Regional water supply demands also heavily influence a drought's overall environmental and economic impact. Unfortunately, droughts are often exacerbated by human activities – i.e. the overuse of water resources through agricultural, industrial, and/or residential consumption. Other weather events, such as heat waves or windstorms, can also increase the severity and impact of a drought immensely. The standard classification system for droughts is given in Figure 5-24, below.

Figure 5-24: Drought Classification Scheme[70]

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested.
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed.
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions.
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.

Droughts can have a variety of impacts. Some are felt in a relatively short period of time, while others may take much longer to become noticeable. For example, after a few weeks without rain vegetation may begin to show signs of stress. However, it may take months for a drought's affects on groundwater to become fully evident. Conversely, vegetation may return to health shortly after a substantial rainfall, while it takes much longer for groundwater to be replenished. Short term droughts last less than six months and can have direct impacts on agriculture and other human activities (i.e. recreation & industry). Long term droughts last

longer than six months, reflect a serious hydrological imbalance, and can have severe ecological, economic, and social consequences.[71]

The economic impacts of droughts can be enormous. Between 1980 and 2011 there were 16 droughts in the United States that caused over $1 billion dollars in damage.[72] Cumulatively these 16 events cost an estimated $200.45 billion. Most of the damage was associated with crop and livestock losses. However, droughts also significantly impact the productivity of certain water dependant industries, such as mining and chemical manufacturing. Other industries are dependent on water to transport goods and materials (e.g. the shipping of commodities via river barges). While crop insurance helps to mitigate the impacts of droughts on the economy, the economic repercussions can last for years.

Droughts can also have considerable social impacts. In the 1930's a series of severe droughts known as the Dust Bowl decimated much of the central Great Plains. The Dust Bowl resulted in the largest migration in United States history.[73] By 1940, approximately 2.5 million refugees (25% of the regional population) had left the plains to seek work elsewhere. Most had either abandoned their farms or were evicted. The social upheaval that resulted from the Dust Bowl is a potent example of how droughts can impact the fabric of American society.

Relationship to other Hazards

Droughts can increase an area's susceptibility to wildfire by increasing the amount of dry vegetative fuel. Vegetation weakened by a lack of sufficient moisture may also be more susceptible to attack by diseases and invasive species. Prolonged drought can result in the loss of vegetation, thereby increasing the risk of erosion during heavy rainfall and flood events.

5.3.1.B. Previous Occurrences

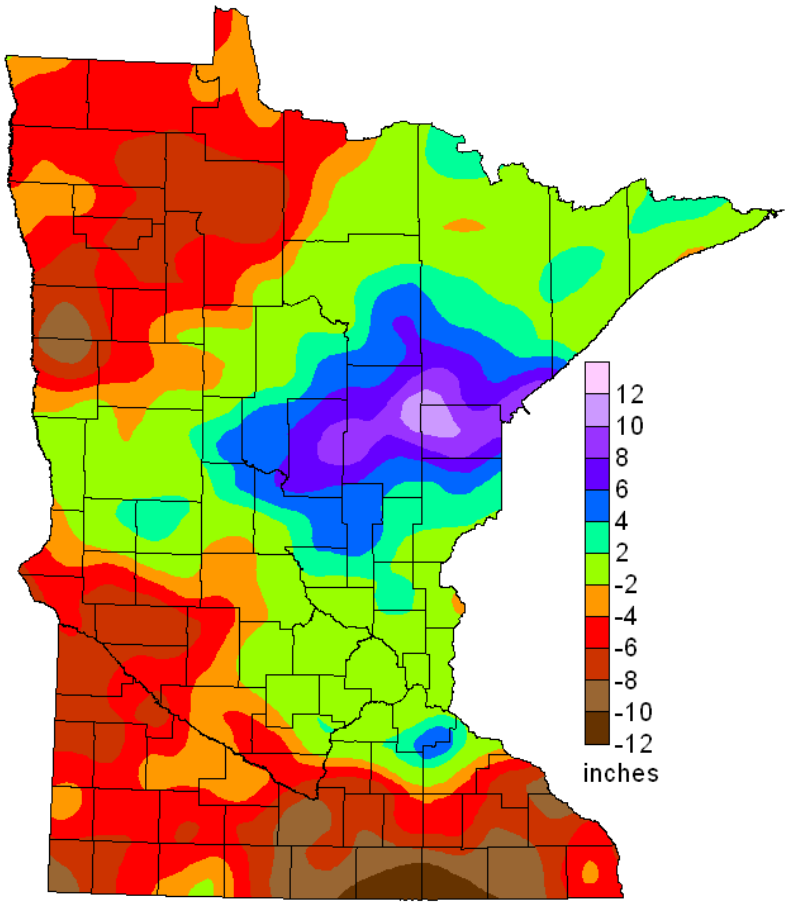
The 2011 Minnesota All-Hazard Mitigation Plan Update and the Minnesota Climatology Working Group identifies the following droughts as having impacted Waseca County.

Figure 5-25: Droughts Impacting Waseca County[74]

Date	Location	Description
1911-1914	Statewide	Intensity and duration differed locally.
1931-1942	Statewide	Intensity and duration differed locally.
1976-1977	Statewide	Began in 1974 in parts of south-central and western MN. Most severely affected areas were the Otter Tail and Lac Qui Parle River basins. Dry conditions caused lower water levels in wells and caused record low stream flows throughout the state. Late summer forest fires broke out and conflicts arose between domestic well owners and neighboring high capacity well owners.
1987-1989	Statewide	Established new "average low precipitation" and "average high temperature" records. Farmers lost most, if not all, of the year's crop. Drought also affected power production, the forest products industry, public water supplies and fish and wildlife dependent on adequate surface water. Mississippi River flow levels threatened to drop below the Minneapolis Water Works intake pipes.
July 2003 – October 2003	Multiple, south central, southeastern and west-central Minnesota	A persistent weather pattern resulted in extremely dry weather across Minnesota. Few widespread rain events moved through the state during the interval, and precipitation totals were less than six inches across much of Minnesota. During this three month period, rainfall totals rank among the lowest on record for many areas of south central and southeastern Minnesota, and a small portion of west central Minnesota.
September 2011 – Present [75]	Statewide	Beginning in August of 2011, Waseca County has witnessed a nearly continuous departure from normal precipitation. This period is actually comprised of two drought events; dry conditions ceased briefly during the spring of 2012. From October 2011 to May 2012 the majority of the county was considered to be in a severe drought. As of August 2012, the south-western half of the county is considered to be abnormally dry.

The DNR's Division of Ecological and Water Resources notes that between August 2011 and August of 2012, Waseca County had an average departure from normal precipitation of 10.75 inches – see Figure 5-26 below.[76]

Figure 5-26: Total Departure from Normal Precipitation
August 2011 – August 2012[77]



5.3.1.C. FEMA Declared Disasters

There have been no federally declared disasters specific to drought.

5.3.1.D. Geographic Location

The entire county is at risk from drought.

5.3.1.E. Hazard Extent

The extent of the damage that may be caused by drought fluctuates depending on the severity and duration of the event.

5.3.1.F. Vulnerability Analysis

Critical Facilities

Given the nature of the hazard, drought itself does not pose a significant risk to critical facilities in the County. However, as mentioned above, extreme drought can greatly enhance the risk of wildfires. See section 5.3.3.F below for analysis of critical facility vulnerability for this hazard.

5.3.2 Earthquake

5.3.2.A. Definition & Background

Earthquakes result from the buildup and abrupt release of stored energy within the earth's crust, which occur along the edges of tectonic plates – known as fault lines. However, small earthquakes can also result from volcanic eruptions and atomic explosions.

The Earth's outermost shell, the Lithosphere is comprised of multiple tectonic plates. Due to an unequal distribution of heat within the planet, these plates are continually moving, changing their size and shape. Anywhere these plates collide, diverge, or slide past each other earthquakes can occur. Virtually all of the continental United States and approximately the western half of Atlantic Ocean sit atop the North American Plate. This plate originates in the center of the Atlantic and slowly moves westward until it meets the Pacific Plate along the west coast of North America. As such, there are no tectonic boundaries in the Midwest. However, there exist several ancient fault lines that are presently inactive. One such fault, known as the Mid-continental Rift, runs from Kansas up through Nebraska, Iowa, and Minnesota. This fault represents the remnants of a billion year old divergence in the continental crust. [78] The Mid-continental Rift and other ancient faults are essentially weak spots in the North American Plate. These weak spots can be slightly reactivated under the stress of the plate's westward movement. It is believed that the temporary reactivation of ancient fault lines is the source of earthquakes in Minnesota.[79]

Earthquakes are assessed in terms of magnitude and intensity. Magnitude is expressed on the Richter scale and is a measure of the amplitude of the largest seismic waves caused by a particular earthquake. Intensity is expressed on the Modified Mercalli Intensity (MMI) scale and is a subjective measure of the earthquake's effects at a certain location. While an earthquake has only one magnitude, its intensity varies by location.[80] See Figure 5-27 for a comparison of magnitude and intensity.

Figure 5-27: Earthquake Magnitude and Intensity[81]

Magnitude (Richter)	Intensity (MMI)	Description of Potential Effects
1.0 - 3.0	I	**I.** Not felt except by a very few under especially favorable conditions.
3.0 - 3.9	II – III	**II.** Felt only by a few persons at rest, especially on upper floors of buildings. **III.** Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0 - 4.9	IV – V	**IV.** Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rock noticeably. **V.** Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 - 5.9	VI – VII	**VI.** Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII.** Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 - 6.9	VII – IX	**VIII.** Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. **IX.** Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and higher	VIII or higher	**X.** Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI.** Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII.** Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Each year there are nearly 1.5 million earthquakes globally.[82] However, the vast majority (1.3 million) are too small to be noticed by the general public. According to the University of Minnesota, the state is expected to experience a magnitude 4 earthquake every 10 years, a magnitude 4.5 earthquake every 30 years, a magnitude 5 earthquake every 89 years, and a magnitude 5.5 earthquake every 266 years; an earthquake greater than 5.5 is highly unlikely and has a recurrence rate of several hundred to several thousand years.[83]

Earthquakes can cause enormous amounts of destruction. The damage inflicted by an earthquake depends on the depth, location, and magnitude of the event. In general, an earthquake that occurs deep within the crust, with a surface location that is undeveloped and sparely populated, and has a low magnitude is less likely to cause damage than an earthquake with the opposite characteristics. Additionally, the composition of the ground and the design of the built environment heavily influence the amount of damage caused by an earthquake. For example, bedrock tends to shake less during an earthquake than soft sediment. In areas where the soil is saturated with water, earthquakes can cause a phenomenon known as liquefaction.

During liquefaction, the saturated soil momentarily turns from a solid into a liquid. As a result, storage tanks and sewer lines may literally float to the surface, while buildings and other structures sink into the ground.[84]

Relationship to Other Hazards

Earthquakes can cause, or contribute to, a wide variety of other hazards. Some of these secondary hazards are common regardless of an earthquake's location, such as fires, infrastructure failure, hazardous material release, and a major disruption of essential services and systems. Other secondary hazards are specific to certain geographic areas. These hazards include flash floods, landslides, avalanches, and tsunamis.

5.3.2.B. Previous Occurrences[85]

There have been no previous occurrences of earthquakes with an epicenter in Waseca County. Since 1860, there have been 20 earthquakes in Minnesota. The two closest reported events occurred near New Prague (December 16, 1860; magnitude 4.7) and New Ulm (February 5-12, 1881; magnitude 3.5).

5.3.2.C. FEMA Declared Disasters

There have been no federally declared disasters specific to earthquakes.

5.3.2.D. Geographic Location

The entire county is at risk from earthquakes. Were an earthquake to occur the greatest damage would likely take place within the built up portions of the county (i.e. urbanized areas). Large portions of the county, including the natural and agricultural areas, are at a much lower risk of suffering damage from a potential earthquake.

5.3.2.E. Hazard Extent

The extent of the damage that may be caused by an earthquake depends on the depth, location, and magnitude of the event.

5.3.2.F. Vulnerability Analysis

Critical Facilities

All critical facilities in the county would be vulnerable to damage if an earthquake occurred. This includes both structural damage to the facility itself and any secondary damage that might occur with the earthquake's relationship to other hazards. Especially concerning would be an earthquake triggering a hazardous material release. Given the disruption that would occur to essential services and transportation infrastructure if the earthquake was of sufficient size, it is likely that a hazardous material release of this nature would take significantly longer to mobilize against and evacuation might not be an option. See section 5.3.5.F for an analysis of critical facilities in relation to hazardous material sites.

5.3.3 Fire

5.3.3.A. Definition & Background

The fire hazard includes structure fires, vehicle fires, and wildfires.

Structure Fires[86]

A structure fire is a fire that primarily consumes elements of the built environment, such as homes, stores, or warehouses. In 2010, there were 14,561 reported fires of all kind in Minnesota, or 29 fires for every ten thousand people – see Figure 5-28. Structure fires accounted for 43.5% (6,332) of these fires. Residential fires are by far the most common, costly, and deadly type of structural fire. Seventy-six percent of all structure fires occurred on residential property. In 2010, there was a total of $152.1 million in property losses in Minnesota. Of this total, $96.9 million were due to residential fires. Residential fires also accounted for 87% of total fire fatalities and 88% of all fire related injuries.

The top three causes of structure fires in Minnesota are cooking (49%), open flame[87] (10%), and heating (9%). While careless smoking accounted for only 4% of structure fires, it caused 18% of all fire fatalities. Additionally, 36% of residential casualties were caused by improperly maintained or missing smoke alarms. Alcohol and/or drug use was an impairing factor in 36% of all fire deaths. The most deadly fires occurred between midnight and 6 a.m. (representing 49% of fire deaths) and the most deadly time of year was January through April (representing 54% of fire deaths). Residential fires are twice as likely in winter than in summer.[88]

Anticipated Number of Fires & Fire Fatalities

Fire casualties and fatalities are closely correlated to population density. In Minnesota there were a total of 39 fire fatalities in 2010 – vehicle and wildfire account for the five non-residential fire deaths. This calculates to approximately 8.6 fire deaths per million people. This number is 45% below the Midwestern rate of 15.4 deaths per million and is 27% below the U.S. average of 11.8 deaths per million. Figure 5-28 depicts the estimated number of fires and the number of fire fatalities based on population. Using this method of estimation, Waseca County may expect to witness approximately 58 fires per year and one fire related fatality every six years.

Figure 5-28: Anticipated Number of Fires and Fire Fatalities based on Population

Population	Anticipated No. of Fires	Anticipated No. of Fire Fatalities
10,000	29 per year	1 every 12 years
20,000	58 per year	1 every 6 years
40,000	116 per year	1 every 6 years
60,000	174 per year	1 every 2 years
100,000	290 per year	1 every 13-14 months
300,000	870 per year	2.5 per year
350,000	1,050 per year	3 per year

Vehicle Fires[89]

A vehicle fire is a fire that primarily consumes mobile property, such as automobiles, trucks, trains, buses, or boats. According to the State Fire Marshall, vehicle fires accounted for 19.8% (2,884) of all Minnesota fires in 2010 – 2.8% higher than the U.S. average. Nationally, vehicle fires caused 12% of all fire deaths, 8% of civilian fire injuries, and 9% of the direct property damage from reported fires. Nine out of ten vehicle fires involved highway vehicles. Three-quarters of highway vehicle fires resulted from mechanical or electrical failures or malfunctions. Although collision was the cause of only 3% of vehicle fires it accounts for 58% of vehicle fire deaths.

Wildfire[90]

A wildfire is a fire that primarily consumes elements of the natural environment, such as grasses, shrubs, or trees. In the State Fire Marshal's *Fire in Minnesota: 2010 Annual Report*, wildfires are combined with dumpster/trash fires into an "other fires" category. These other fires accounted for 36.7% (5,345) of all Minnesota fires in 2010. Wildfires can occur almost anywhere in the state and during any month of the year. In Minnesota, the majority of wildfires occur during spring while vegetation is still dormant.

The causes of wildfires are numerous. Many wildfires occur naturally as part of an ecological cycle which provides ecosystems with a means of reducing dead vegetation, stimulating new growth, and improving habitat for wildlife.[91] However, 85% of all wildfires in Minnesota occur as a result of human activity. The largest causes are the burning of debris (38%) and arson (28%). Only two percent of wildfires in Minnesota are the result of lightning strikes – the primary natural cause of wildfires. Nationally, 16% of wildfires are caused by lightning.

The magnitude and behavior of wildfires are highly variable and are determined according to three main factors, the first of which is fuel. For example, wildfires in Minnesota tend to be more prevalent in the northern portion of the state than in the southern portion (both in number and destructive potential) because the dense forest vegetation in northern Minnesota provides abundant fuel for large wildfires. In the south, the landscape is dominated by grassland and industrial cropland. Such vegetation ignites more easily and burns more quickly than dense forest, but releases comparatively little energy. As a result, wildfires that consume grasses and crops typically pose less risk to life and property than large forest fires because they are more easily controlled. The moisture content of the fuel is also of great influence – low fuel moisture corresponds to an increased risk from fire.

Topography is the second determining factor, in which slope, aspect, and terrain all play an important role.[92] The steepness of the slope affects both the rate and direction that a fire will spread. Fires tend to move faster uphill than downhill and the steeper the slope, the faster the fire will move. Aspect refers to the direction in which the slope is oriented and can influence a wildfire in several ways. For example, south-facing slopes will normally have higher temperatures, stronger winds, a lower humidity, and lower fuel moistures – all of which increase wildfire risk. Lastly, features in the terrain impact wildfires by influencing the speed and direction of the wind. For instance, gulches effectively funnel air thereby increasing both

wind speed and the rate of fire spread. Conversely, irregularities in the terrain – such as large boulders – create friction thereby producing the opposite effect.

The third and final determining factor is weather, which includes wind, temperature, and humidity.[93] The role wind plays in wildfires cannot be understated: the stronger the wind, the faster the spread of the fire. Wind essentially feeds the fire by supplying additional oxygen without which the fires could not easily spread. Wind also flattens the flames, pre-heating the fuel ahead and causing spot fires by blowing sparks and embers ahead of the main fire. In addition to wind, high temperatures help to preheat wildfire fuel as well. The temperature of the air also impacts the movement of air currents and the amount of humidity in the air. Warm air absorbs moisture and produces a lower humidity. This decreases the moisture content of fuel and increases the risk from wildfires. Precipitation too plays an important role in wildfires; drought seriously increases the possibility of wildfire.

Wildfires are normally thought of occurring in rural settings. However, wildfire has the potential to impact suburban and even urban areas. The potential for property damage from wildfire has increased significantly in the last half century as exurban development has become more common. Wildfires also have the potential to severely impact regional economies, such as tourism, logging, and agriculture.

Relationship to other Hazards

In many situations, fires can occur as the result of other hazards – such as earthquakes, tornadoes, floods, or windstorms. For example, an earthquake may ignite fires by rupturing natural gas distribution systems or downing power lines. However, lightning is by far the most common natural cause of both structural fires and wildfires.

Fires can also contribute to the probability of another hazard occurring. For example, wildfires can strip away vegetation from hillsides, increasing the risk of severe soil erosion, landslides, and flooding. Areas recently cleared by wildfire may also be at increased risk of invasive species. Many industries utilize hazardous materials that are also flammable. Industrial structural fires therefore must be handled with great caution to avoid the compound threat of fire with the potential for hazardous material release.

In other situations various hazards can significantly impair a fire department's ability to fight fires. For instance, a flood may restrict the movement of emergency vehicles by damaging roads and leaving debris on streets, or it may inundate an emergency facility and impair departmental operations.

5.3.3.B. Previous Occurrences

According to the State Fire Marshal, between 1998 and 2010 there local fire departments responded to 1,030 fires in Waseca County. This number includes structural, vehicle, and wildfires. These fires resulted in $11.2 million in damaged property and six deaths. The 12 year average calculates to approximately 80 fires, $860,000 in damages, and 0.5 deaths per year. On average there is one fire per 336 people in the county. Figure 5-29 depicts data on fires for the county; Figure 5-30 depicts city fire data.

Figure 5-29: County Fire Data[94]

Year	WASECA - COUNTY				
	Total Fire Runs	Total Other Runs	Total Dollar Loss	Fire Rate (one fire per number of persons indicated)	Fire Deaths
1998	59	173	$274,400	341	1
1999	66	209	$596,005	312	0
2000	100	242	$518,100	199	1
2001	77	237	$387,500	349	0
2002	66	8946	$241,800	424	0
2003	93	231	$449,500	247	0
2004	71	275	$249,200	306	0
2005	76	299	$385,080	316	0
2006	90	222	$2,087,800	438	0
2007	78	253	$348,550	393	0
2008	110	303	$3,549,855	311	1
2009	89	330	$1,804,700	283	2
2010	55	387	$345,400	438	1
Total	***1030***	***12107***	***$11,237,890***	***4357***	***6***
Average	***80***	***932***	***$864,453***	***336***	***0.5***

Figure 5-30: City Fire Data[95]

Year	JANESVILLE		
	Total Fire Runs	Total Other Runs	Total Dollar Loss
1998	12	81	$207,700
1999	19	101	$133,000
2000	16	119	$242,600
2001	12	127	$0
2002	14	180	$38,000
2003	15	122	$2,000
2004	12	122	$0
2005	16	123	$0
2006	31	109	$0
2007	17	137	$0
2008	23	121	$0
2009	12	121	$0
2010	21	165	$41,000
Total	***220***	***1628***	***$664,300***
Average	***17***	***126***	***$51,100***

Year	NEW RICHLAND		
	Total Fire Runs	Total Other Runs	Total Dollar Loss
1998	2	1	$3,700
1999	4	0	$12,000
2000	17	19	$77,000
2001	15	23	$243,500
2002	14	23	$19,300
2003	13	23	$29,000
2004	6	37	$9,200
2005	10	40	$50,400
2006	6	9	$15,000
2007	20	28	$204,050
2008	17	70	$365,155
2009	19	81	$1,505,200
2010	4	73	$40,000
Total	***147***	***427***	***$2,573,505***
Average	***12***	***33***	***$197,962***

Year	WALDORF		
	Total Fire Runs	Total Other Runs	Total Dollar Loss
1998	9	9	$28,000
1999	9	23	$42,000
2000	10	23	$0
2001	4	5	$0
2002	8	11	$110,500
2003	9	20	$23,000
2004	7	23	$0
2005	8	24	$321,680
2006	8	24	$17,000
2007	8	32	$7,200
2008	28	33	$3,001,000
2009	8	22	$116,750
2010	5	29	$31,000
Total	***121***	***278***	***$3,698,130***
Average	***10***	***22***	***$284,472***

Year	WASECA - CITY		
	Total Fire Runs	Total Other Runs	Total Dollar Loss
1998	36	82	$35,000
1999	34	85	$409,005
2000	57	81	$198,500
2001	46	82	$144,000
2002	30	112	$74,000
2003	56	66	$395,500
2004	46	93	$240,000
2005	42	112	$13,000
2006	45	80	$2,055,800
2007	33	56	$137,300
2008	42	79	$183,700
2009	41	106	$182,750
2010	25	120	$233,400
Total	***533***	***1154***	***$4,301,955***
Average	***41***	***89***	***$330,920***

The DNR keeps a database of wildfire events and reports one wildfire between 2002 and 2011.[96] This fire burned approximately 0.4 acres of non-forested land.

5.3.3.C. FEMA Declared Disasters

There have been no federally declared disasters specific to fire.

5.3.3.D. Geographic Location

While the entire county is at risk from fire, the level of risk varies by type of fire and the location of the fire. The risk from structural fire is greater in the urban portions of the county, while the risk from wildfire is greater in the rural and natural areas. For example, farm fields and ditches are particularly susceptible to wildfires. The risk from vehicle fires is greatest in the urban areas and along major transportation routes.

The risk from fires is also influenced by location within the county and the proximity to available emergency responders and adequate water for fire suppression. In this sense, rural areas are at a disadvantage in that it will take firefighters longer to reach the fire and upon arrival they may have to rely on water from tanker trucks to suppress the fire. In this regard, rural areas may have a slightly higher level of risk.

5.3.3.E. Hazard Extent

The extent of the damage that may be caused by fires also depends on the type of fire. The damage that may result from structural fires depends on the design, use, and location of the structure, as well as the behavior of those people who may be living or working in the structure. Similarly, the potential for damage from wildfires depends on fuel availability, weather and terrain. The relative lack of sufficient fuel for large wildfires limits the scope of the damage that is possible. The damage that may result from vehicle fires depends on the location of the fire and the type of vehicle. For example, the extent of damage from a motorcycle fire would be significantly less than that of a semi-trailer or large passenger bus.

5.3.3.F. Vulnerability Analysis

The maps below depict areas of the county that are vulnerable to wildfire and structural fires. Areas are ranked from low to high. The map was produced from data from the National Land Cover Database (NLCD), which categorized land based off what types of features are present.

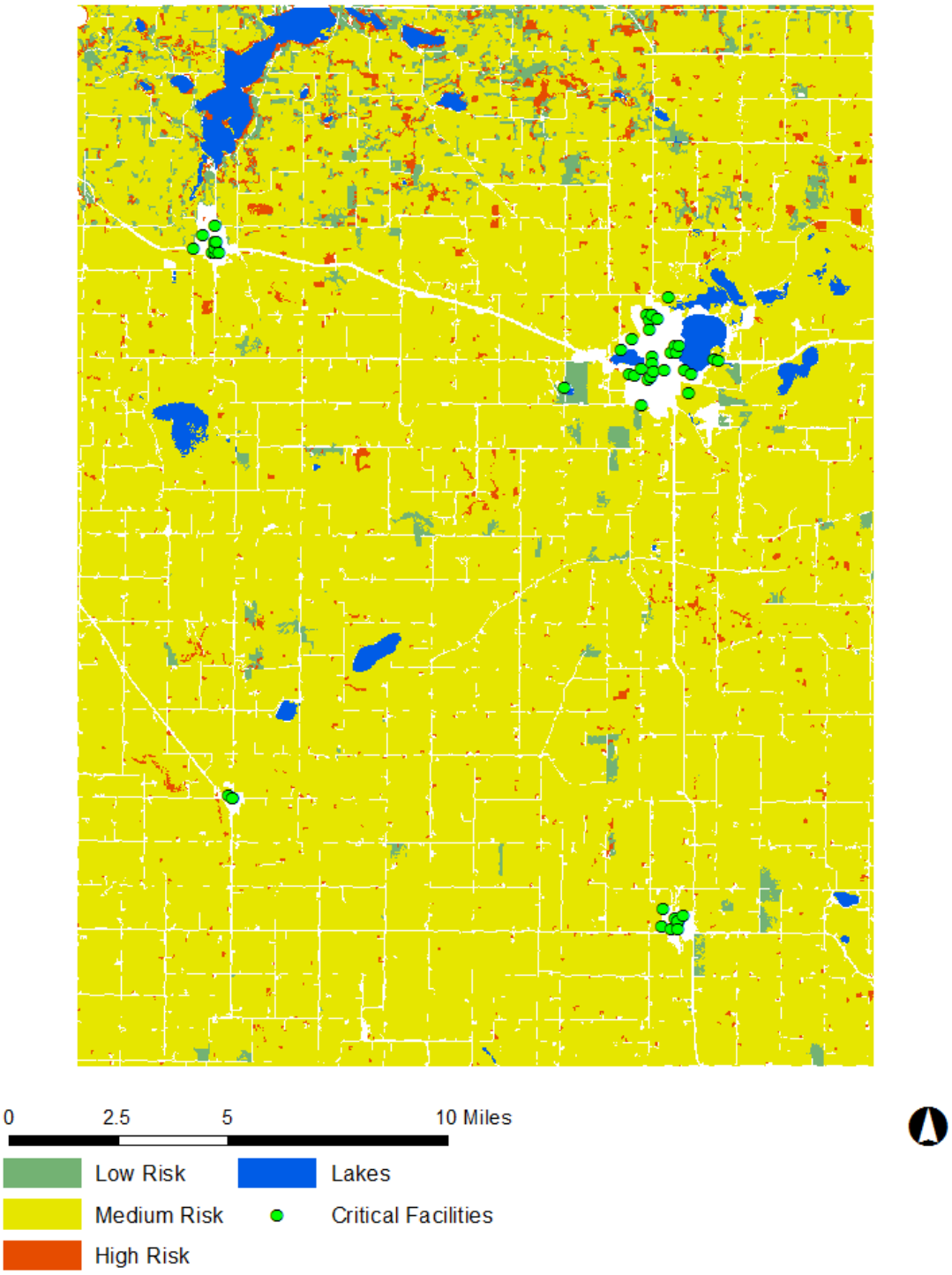
Wildfire

Low risk areas include urbanized areas and open water. Medium risk areas include crop lands and wetlands. High risk areas include shrub lands and forested areas.

Structural Fire

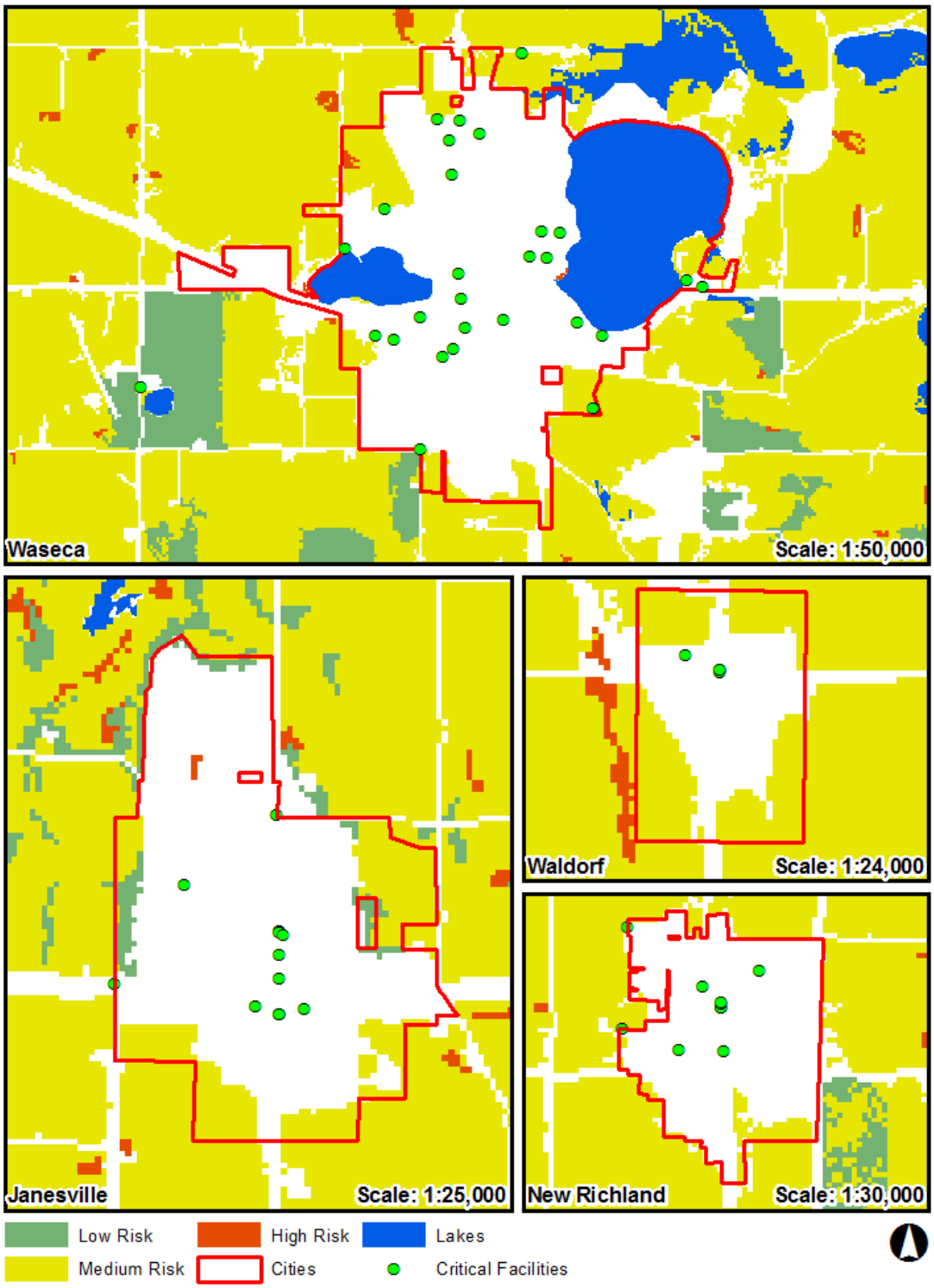
Very low potential areas include croplands, wetlands, shrub lands, forested areas, and open water where structures are not typically found. Low potential areas include low density urban areas where up to 25% of the surface area is impervious. Medium potential areas include more densely settled urban areas where up to 50% of the surface area is impervious. High potential areas include very densely settled land that is covered up to 100% by impervious surfaces. NLCD data does not distinguish between types of structures present. Impervious structures include buildings, bridges, roadways, parking lots, and all other manmade objects.

Figure 5-31: Vulnerability of Waseca County to Wildfire



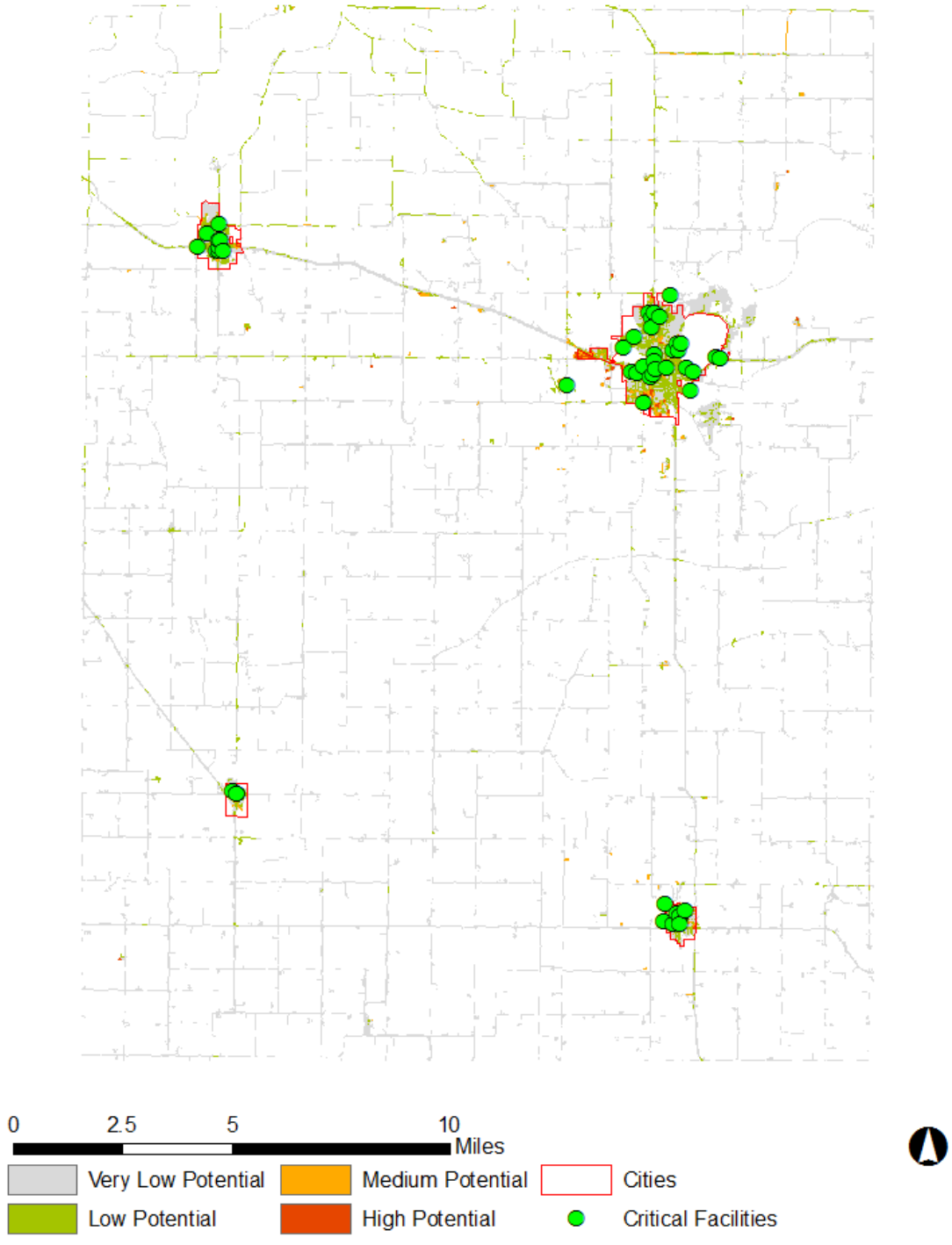
SOURCE: MN DNR National Land Cover Database, 2001

Figure 5-32: Vulnerability of Waseca County Cities to Wildfire



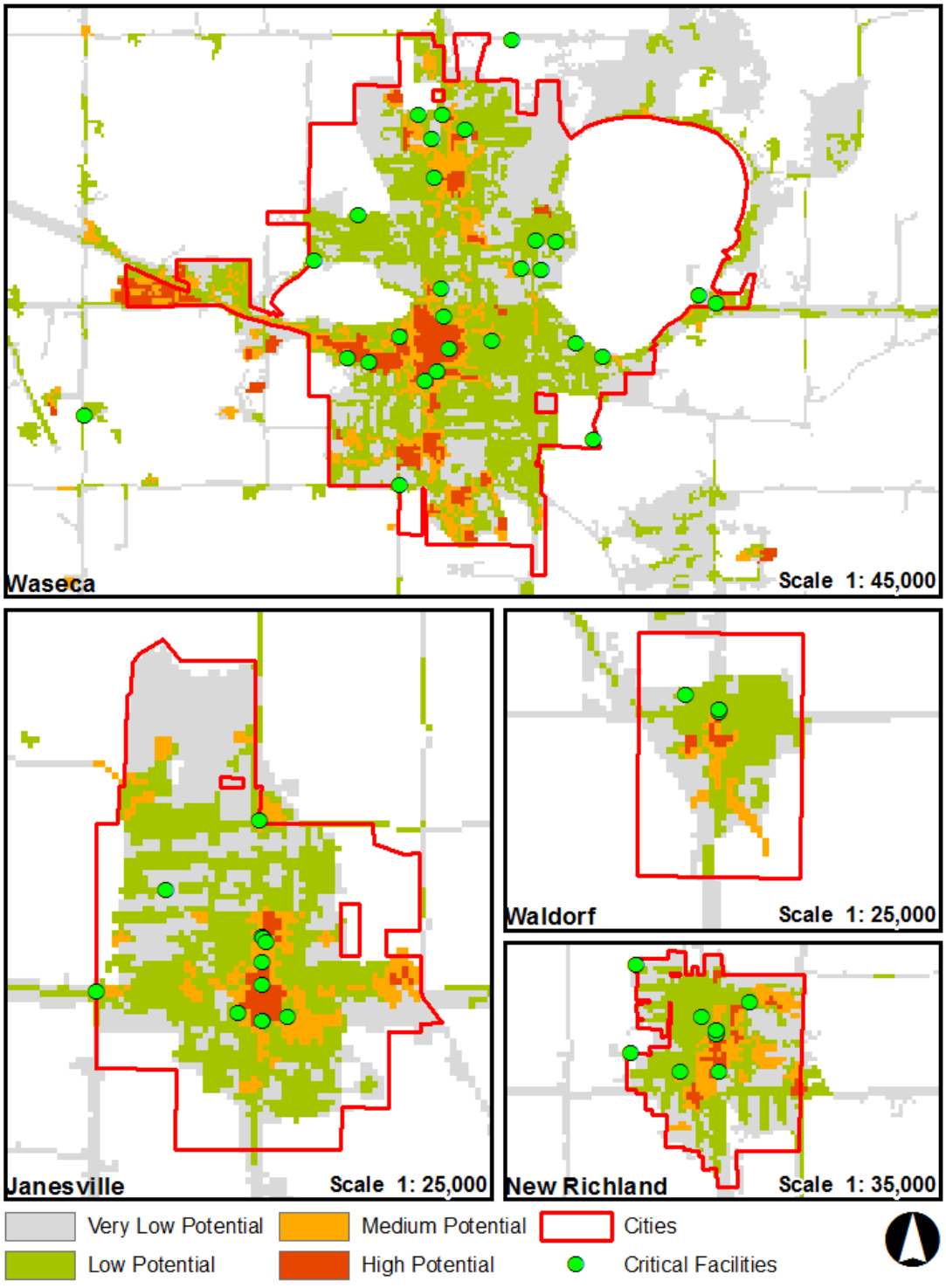
SOURCE: MN DNR National Land Cover Database, 2001

Figure 5-33: Vulnerability of Waseca County to Structural Fires



SOURCE: MN DNR National Land Cover Database, 2001

Figure 5-34: Vulnerability of Waseca County Cities to Structural Fires



SOURCE: MN DNR National Land Cover Database, 2001

Critical Facilities

Figure 5-35: Buildings Exposed to Wildfire

Name	Type	City	Cost	Risk Level
City of New Richland	Wastewater	New Richland	$1,557,066	Medium
City of Waseca	Wastewater	Waseca	$400,000	Medium
City of Waseca	Wastewater	Waseca	$600,000	Medium
TOTAL			**$2,557,066**	

Figure 5-36: Buildings Exposed to Structure Fire

Name	Type	City	Cost	Risk Level
Mayo Clinic Health System in Janesville	Medical Care	Janesville	$0	High
Janesville Fire Station	Emergency Response	Janesville	$170,000	High
Janesville-Waldorf-Pemberton High School	School	Janesville	$0	High
City of Waseca	Potable Water	Waseca	$1,500,000	High
Sacred Heart Elementary	School	Waseca	$2,000,000	High
Waseca Police Station (Emergency Operations Center)	Law Enforcement	Waseca	$1,850,000	High
Waseca County Sherriff's Department (Emergency Operations Center)	Law Enforcement	Waseca	$3,226,100	High
Waseca Fire Station	Emergency Response	Waseca	$1,097,800	High
City of New Richland	Potable Water	New Richland	$718,181	High
City of Janesville	Potable Water	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
Trinity Lutheran School	School	Janesville	$1,080,000	Medium
Janesville-Waldorf-Pemberton Elementary School	School	Janesville	$0	Medium
City of Janesville	Potable Water	Janesville	$0	Medium
Waldorf Fire Station	Emergency Response	Waldorf	$157,200	Medium
City of Waldorf	Potable Water	Waldorf	$2,000,000	Medium
City of Waldorf	Potable Water	Waldorf	$150,000	Medium
Mayo Clinic Health System in Waseca	Medical Care	Waseca	$6,798,500	Medium
City of Waseca	Potable Water	Waseca	$1,500,000	Medium
Team Academy	School	Waseca	$0	Medium

Name	Type	City	Cost	Risk Level
Charter School				
Central Intermediate School	School	Waseca	$12,000,000	Medium
New Richland Police Station	Law Enforcement	New Richland	$343,100	Medium
New Richland Fire Station	Emergency Response	New Richland	$140,900	Medium
City of New Richland	Potable Water	New Richland	$16,105	Medium
City of New Richland	Potable Water	New Richland	$664,575	Medium
City of Waseca	Wastewater	Waseca	$400,000	Medium
City of Janesville	Wastewater	Janesville	$0	Low
Janesville Police Station	Law Enforcement	Janesville	$295,200	Low
City of Waldorf	Wastewater	Waldorf	$2,000,000	Low
City of Waseca	Wastewater	Waseca	$40,000,000	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
City of Waseca	Potable Water	Waseca	$1,500,000	Low
City of Waseca	Wastewater	Waseca	$1,500,000	Low
City of Waseca	Wastewater	Waseca	$800,000	Low
Waseca Junior High School	School	Waseca	$10,000,000	Low
City of Waseca	Potable Water	Waseca	$1,500,000	Low
Waseca Senior High School	School	Waseca	$14,000,000	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
Mayo Clinic Health System in New Richland	Medical Care	New Richland	$0	Low
Hartley Elementary School	School	Waseca	$4,000,000	Low
City of Waseca	Wastewater	Waseca	$1,000,000	Low
New Richland-Hartland-Ellendale-Geneva High School	School	New Richland	$0	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
City of Waseca	Wastewater	Waseca	$30,000	Low
City of New Richland	Wastewater	New Richland	$0	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
City of Waseca	Wastewater	Waseca	$60,000	Low
TOTAL			**$114,897,661**	

Building Inventory

736 buildings within the county are at a high risk from wildfire, 4,947 buildings are at a medium risk to wildfire, and 1,595 buildings are at low risk from wildfires. There are 341 buildings at high risk from structural fire, 970 buildings at medium risk, and 4,550 buildings at low risk.

5.3.4 Flood

5.3.4.A. Definition & Background

In general, flooding occurs when land is temporarily submerged due to an excess accumulation of water. According to the Federal Interagency Floodplain Management Task Force, flooding in the United States can be divided into several categories, including: riverine floods, flash floods, alluvial fan floods, ice-jam floods, dam-break floods, local drainage floods, high groundwater floods, fluctuating lake level floods, coastal floods, debris flows, and subsidence.[97] In Minnesota, the most common types of flooding are riverine, flash, and local drainage.[98]

Riverine flooding, also known as overbank or downstream flooding, is the most common type of flood. It occurs when a stream or river overflows its banks and inundates the surrounding floodplain. These floods tend to be large scale events caused by prolonged precipitation over a wide area. Floodwaters typically move and rise slowly, and remain relatively shallow. Because it takes time for the water in the tributaries to reach a major river, there is usually time to warn those within the flood path downstream. This type of flooding is common in spring and summer and can be compounded by rapid snow melt and/or frozen ground.

Flash flooding, also known as upstream flooding, involves a rapid surge of rising floodwaters into a normally dry area. Flash floods can also occur when the water level of a stream or creek rapidly rises above a predetermined water level. These floods tend to be localized events that begin within six hours of the causative event and typically last less than one day; flash floods do not last for two or three consecutive days.[99] The Minnesota Climatology Working Group defines flash flooding as an event in which six inches of rain or more falls within a 24 hour period.[100] Flash floods are typically caused by abnormally heavy rainfall over a small area. However, flash floods can be caused by any sudden release of a large amount of water (e.g. ice dams, dam and levee failures). In a flash flood, the floodwaters move and rise quickly, and can become dangerously deep. Due to the speed of flash flooding there is often little to no warning time for those within the flood path. Flash floods are most common in spring and summer, but can occur at any time. Like riverine floods, flash floods can also be complicated by frozen ground.

Local drainage flooding is similar to flash flooding, but is primarily the result of overwhelmed, or inadequate, infrastructure. This type of flooding typically occurs away from delineated floodplains and recognized drainage channels. Rather, they are common in upstream areas that are flat and urbanized. In such areas the ground's natural ability to accommodate excess water is affected by large areas of impervious materials (e.g. parking lots, roads, sidewalks, rooftops). These impervious surfaces inhibit infiltration and increase surface runoff. When these factors are combined with heavy precipitation and inadequate facilities for stormwater conveyance, a community's drainage system can become quickly overwhelmed. Excess water then begins to pond in low lying areas. These ponds then grow larger, eventually flooding the surrounding vicinity.

Between 1980 and 2011, there were 21 flood events in the United States that caused over $1 billion in damages.[101] In total, these events caused $103.7 billion in total losses and claimed

583 lives. According to the National Climatic Data Center, these events were primarily riverine floods caused by rapid snow melt and/or heavy precipitation. Although they are relatively shallow and slow moving, riverine floods produce widespread and costly destruction. Just a few inches of floodwaters can damage homes, drown crops, and impact economic activity. On average, riverine flooding causes more than $2 billion in losses each year.

By comparison, flash floods inflict damage on a more localized scale. This tends to limit the total amount of destruction caused by any singular event. However, due to the violent nature of flash floods, the damage to the flooded area is often more severe than what may occur during a riverine flood. In areas with steep hills or deep gullies, flash floods can produce walls of water 10 to 20 feet high or higher. The destructive force of the water can roll boulders, uproot trees, topple buildings, and wash out bridges. Flash floods tend to collect and carry large quantities of debris, which increases the floodwaters' destructive potential.

Flooding is the number two weather related killer in the United States. Each year flooding kills an average of 127 people.[102] Nearly half of all flood deaths are automobile-related.[103] Most occur when people mistakenly think they can drive their vehicles across a flooded portion of a roadway. The National Weather Service attributes these deaths to people underestimating the force and power of floodwaters – six inches of water can knock a grown person off their feet, two feet of water can wash away most automobiles.[104] To aid in the prevention of flood related deaths, the National Weather Service issues flood watches and warnings – see Figure 5-37.

Figure 5-37: National Weather Service Flood Alerts[105]

Flash Flood/Flood Watch	Flash flooding or flooding is possible within the designated watch area.
Flash Flood/Flood Warning	Flash flooding or flooding has been reported or is imminent.
Urban/Small Stream Advisory	Flooding of small streams, streets, and low-lying areas (such as railroad underpasses and urban storm drains) is occurring.

Relationship to other Hazards

Flooding is usually associated with heavy precipitation during summer storms. However, it can also be caused by unusually heavy snowfall during the winter season, which then melts when spring arrives. Infrastructure failure can also cause flooding – for example a dam or artificial levee failure. Wildfires can increase the speed of flooding by removing ground vegetation that would otherwise have slowed the flow of floodwaters. The danger from flooding can be compounded when floodwaters breach facilities that contain hazardous materials. Once contaminated, the floodwaters can spread the hazardous materials over large areas. Flooding also poses a risk to groundwater by potentially contaminating wells within the flooded area.

5.3.4.B. Previous Occurrences

According to the National Climatic Data Center, there have been ten floods, four flash floods, and three heavy rain events in Waseca County since 2001. Of these seventeen events, nine occurred in 2010 – five of which were related to a single weather event on March 15th. The NCDC reports that only two of the seventeen events resulted in the loss of life and/or

significant destruction. A flood that occurred on April 1, 2001 claimed three lives, injured another, and caused $200 million in property damage. A flood on September 14, 2004 caused $6.7 million in property damage and $21.6 million in crop damage.

Figure 5-38: Flooding & Heavy Rain Events

Location	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca County	4/1/2001	12:00 PM	Flood	3	1	200.0M	0
Waseca County	6/9/2004	3:15 AM	Flood	0	0	0	0
New Richland	8/1/2004	5:30 AM	Flash Flood	0	0	0	0
Waseca County	9/14/2004	11:45 PM	Flood	0	0	6.7M	21.6M
Countywide	5/12/2005	9:00 PM	Heavy Rain	0	0	0	0
Waseca	8/19/2007	12:45 AM	Flash Flood	0	0	0K	0K
St Mary	5/6/2009	11:00 AM	Heavy Rain	0	0	0K	0K
Janesville	3/15/2010	10:00 AM	Flood	0	0	0K	0K
Matawan	3/15/2010	10:00 AM	Flood	0	0	0K	0K
New Richland	3/15/2010	10:00 AM	Flood	0	0	0K	0K
Waldorf	3/15/2010	10:00 AM	Flood	0	0	0K	0K
Wilton	3/15/2010	10:00 AM	Flood	0	0	0K	0K
Waseca	6/17/2010	19:00 PM	Flash Flood	0	0	0K	0K
Waldorf	7/22/2010	12:00 AM	Heavy Rain	0	0	0K	0K
Waldorf	9/23/2010	2:30 AM	Flash Flood	0	0	0K	0K
Waldorf	9/23/2010	9:00 AM	Flood	0	0	0K	0K
St Mary	3/25/2011	18:00 PM	Flood	0	0	0K	0K

5.3.4.C. FEMA Declared Disasters

There have been four federally declared disasters related to flooding in Waseca County – see Figure 5-39.

Figure 5-39: Flood Hazard Disaster Declarations (1953-2011) [106]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-1941	9/22/2010 - 10/14/2010	10/13/2010	Severe Storms / Flooding	Obama	Public
DR-1116	3/14/1996 - 6/17/1996	6/1/1996	Flooding	Clinton	Public
DR-993	5/6/1993 - 8/22/1993	6/11/1993	Flooding / Severe Storms / Tornadoes	Clinton	Individual & Public
DR-188	4/11/1965 - 4/11/1965	4/11/1965	Flooding	Johnson	Individual & Public

5.3.4.D. Geographic Location

The location of flooding activity is dependent on the type of flood. Sudden and extensive rainfall can create standing water in almost any location if drainage is inadequate. For the purposes of this document, Figure 5-40 in "Section 5.3.4F Vulnerability Analysis" outlines the geographic location of a flood. The figure depicts the 100 year flood boundary identified by the University of Minnesota, Duluth. The 100 year flood boundary presents the geographic location of a flood as land within close proximity to existing water bodies.

5.3.4.E. Hazard Extent

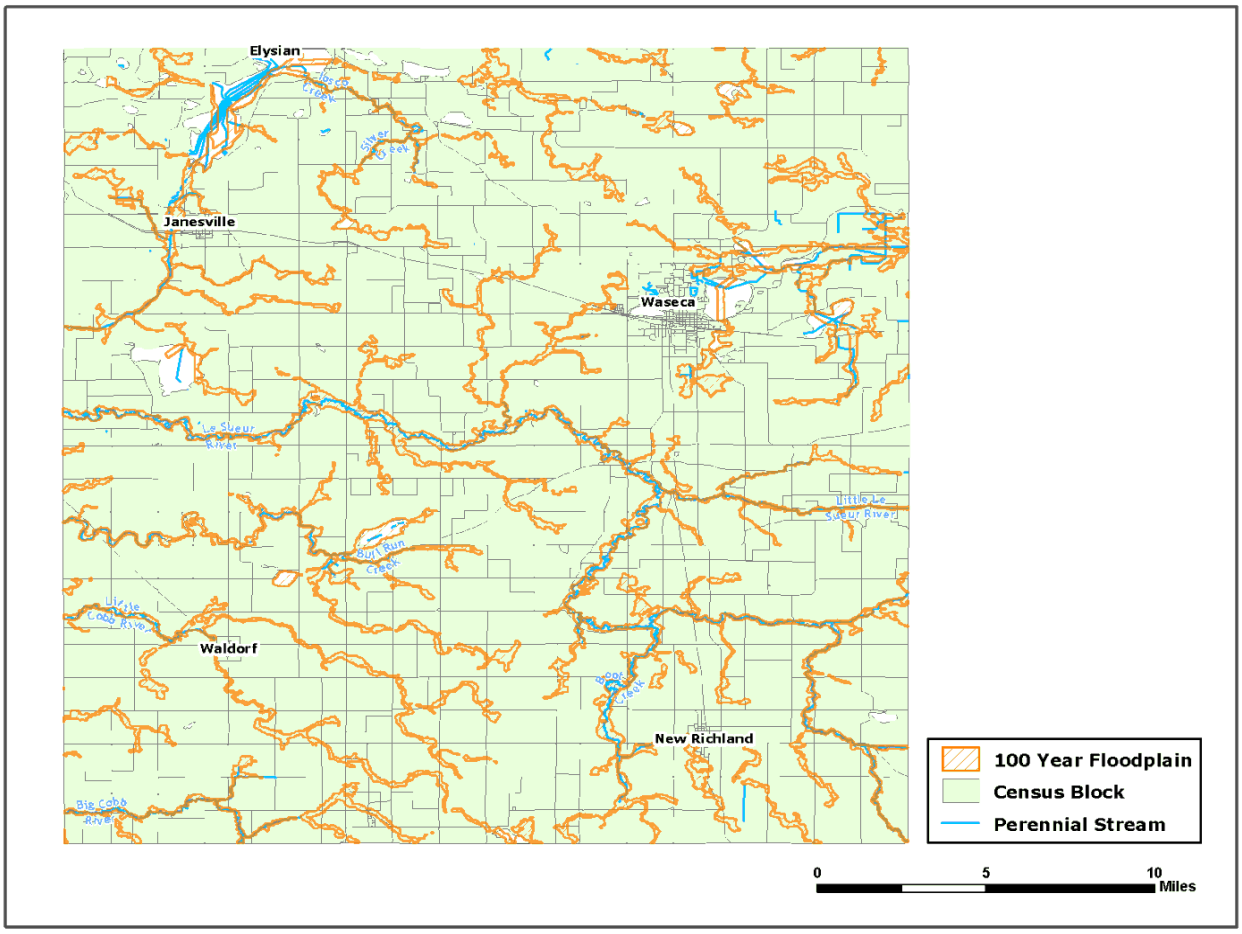
The extent of flooding depends upon climate (e.g. yearly precipitation levels and likelihood of heavy rainfall events), local land use characteristics, and the size and topography of the contributing watershed.

5.3.4.F. Vulnerability Analysis

HAZUS-MH Flood Hazard Analysis[107]

A flood analysis for Waseca County was performed in June of 2010 by the University of Minnesota Duluth. This analysis used HAZUS-MH and was part of a state-wide flood study completed on behalf of HSEM. The 100 year flood boundary calculated using HAZUS-MH is depicted in Figure 5-40 below.

Figure 5-40: HAZUS-MH Analysis (100-Year Flood)



HAZUS-MH Economic Loss Analysis

HAZUS-MH was used to estimate the damages incurred for a 100-year flood event in Waseca County. An estimated 11 buildings will be damaged totaling 5.1 million in building losses and $14.9 million in total economic losses. The total estimated number of damaged buildings, total building losses, and estimated total economic losses are shown in Figure 5-41. It should be noted that the aggregate losses reported in the study may be overstated.

Figure 5-41: Total Estimated Economic Loss from 100-Year Flood

General Occupancy	Total Damaged Buildings	Building Loss	Total Economic Loss
Agricultural	0	$347,000	$1,587,000
Commercial	3	$763,000	$3,333,000
Education	0	$48,000	$419,000
Government	0	$58,000	$594,000
Industrial	0	$563,000	$1,695,000
Religious/Non-Profit	0	$110,000	$1,072,000
Residential	8	$3,235,000	$6,251,000
Total	**11**	**$5,124,000**	**$14,951,000**

HAZUS-MH estimates two census blocks with losses exceeding $1 million. The distribution of losses is shown in Figure 5-42.

Figure 5-42: 100-Year Flood Damage by Census Block

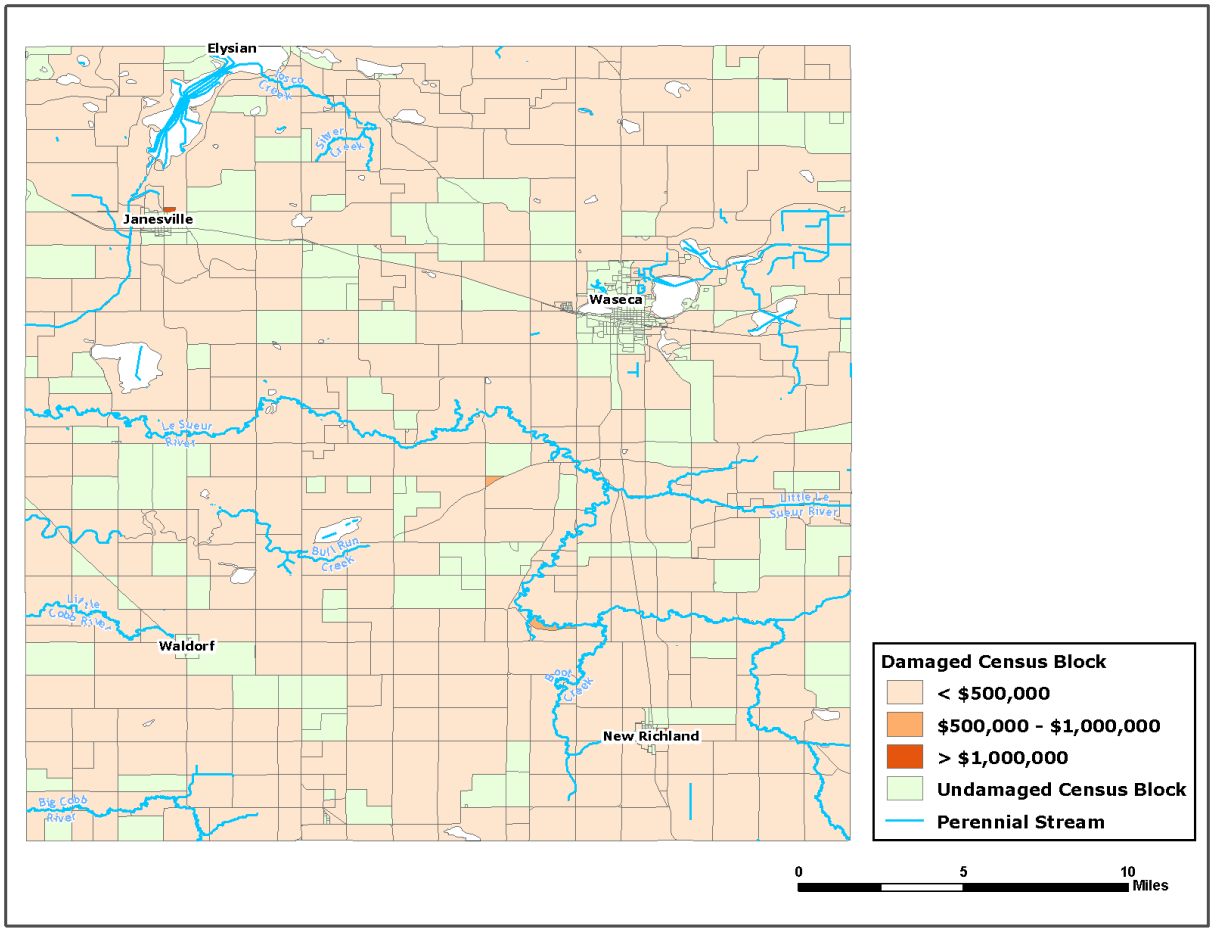
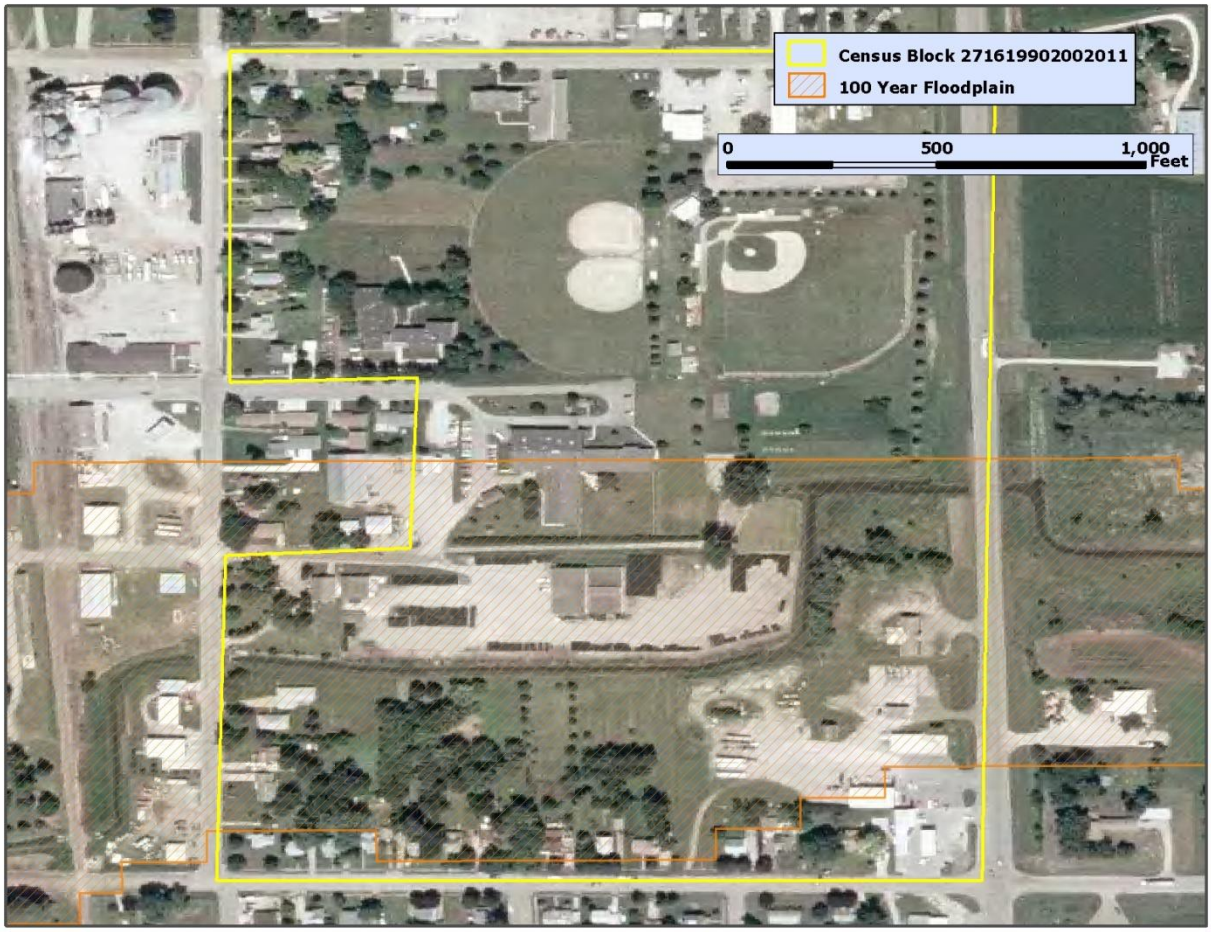


Figure 5-43 below is an example of a census block where the highest damages were reported. This figure shows census blocks overlaid with the flood boundary and an orthophoto of New Richland. Census block 2716119902002011 has an estimated building loss of $357,000 with a total loss of $1.2 million. The overlay shows significant flooding in this census block and several buildings at risk.

Figure 5-43: Flood Damage Exposure in eastern New Richland



HAZUS-MH Essential Facility Loss Analysis

The HAZUS-MH analysis identified two schools that may be subject to flooding. These include the New Richland-Hartland-Ellendale-Geneva High School in New Richland and the school district office in New Richland. A map of essential facilities potentially at risk to flooding is shown in Figure 5-44.

Figure 5-44: Inundated Essential Facilities in southern New Richland

HAZUS-MH Shelter Requirement Analysis

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that may require accommodations in temporary public shelters. The model estimates 282 households may be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 286 people (out of a total population of 19,526) may seek temporary shelter in public shelters.

HAZUS-MH Debris Generation Analysis

HAZUS estimates the amount of debris that may be generated by the flood. The model breaks debris into three general categories:

1. Finishes (dry wall, insulation, etc.)
2. Structural (wood, brick, etc.)
3. Foundations (concrete slab, concrete block, rebar, etc.)

This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 727 tons of debris may be generated. Of the total amount, Finishes comprises 90% of the total. Structure comprises 6% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 29 truckloads (at 25 tons per truck) to remove the debris generated by the flood.

HAZUS-MH State Property Loss Analysis

The HAZUS-MH generated flood boundaries were overlaid with the State of Minnesota owned buildings to determine if any structures are at risk to flooding. None of the state properties included in the HAZUS-MH analysis falls within the flood boundary area in Waseca County.

5.3.5 Hazardous Material Release

5.3.5.A. Definition & Background [108]

Hazardous materials (HAZMAT) may be defined as any chemical substance that poses a short-term or long-term toxicological threat to humans and the environment. HAZMAT may be a solid, gas, or liquid. The United States Environmental Protection Agency sorts HAZMAT into the following categories: toxic agents (irritants, asphyxiates, anesthetics, narcotics, sensitizers); other types of toxic agents (hepatotoxic and nephrotoxic agents, carcinogens, mutagens); hazardous waste; hazardous substances; toxic pollutants; and extremely toxic substances. HAZMAT affects people through inhalation, ingestion, or direct contact with skin.

HAZMAT incidents are normally unintentional. However, they may potentially be the result of criminal or terrorist activity. There are two main kinds of HAZMAT release: release during transportation and fixed-site release. Release during transportation accounts for 96.1% of HAZMAT incidents. Of the total incidents, 81.4% occur as part of highway transportation and 14.7% occur as part of transportation by railroad. Seventy-percent of railroad-related HAZMAT incidents occur during collisions or derailments, or as a result of leaks and defective equipment. Despite the fact that total rail traffic has been increasing, the number of railroad accidents has been decreasing due to the use of improved safety measures.

Fixed-site release accounts for the remaining 3.9% of HAZMAT incidents. HAZMAT is stored, processed, and handled at a variety of different facilities. These facilities range from small to large, including: refineries, chemical plants, storage terminals, manufacturing plants, laboratories, greenhouses, automotive stores, etc. The fixed-site release of HAZMAT may result from different types of leaks or equipment failures, human errors, fire-induced releases, or from natural causes (e.g. earthquakes, floods).

The fixed-site category also includes HAZMAT release from pipelines. Despite improved standards for new pipeline construction, pipeline incidents have not declined in recent years. This is largely due to failures involving older pipelines that are suffering from erosion and age-related deterioration. Damage from agricultural and construction activities, structural and mechanical failures, and natural hazards are also common causes of pipeline incidents.

The impact of a HAZMAT incident can vary drastically, ranging from inconvenient to catastrophic. A number of variables influence the potential impact to the public and the environment, including the type of material(s) released, the amount released, and the location of the release, and the circumstances surrounding of the release. A small incident may force the evacuation a portion of a specific facility; a large incident may cause the evacuation of an entire community. Likewise, a minor release may be cleaned up in a few days, while a major release may take weeks, months, years, or – in extreme and rare situations – prove impossible to decontaminate within our lifetime using existing technology.

Relationship to Other Hazards

Other hazards, natural and human-caused, can result in HAZMAT release. Earthquakes and floods are particularly dangerous. Heavy rain, snow, ice, and high winds can all potentially cause traffic accidents leading to HAZMAT release. Additionally, other hazards can impact the response to HAZMAT incidents by restricting access to release sites, damaging critical response facilities and equipment, and lowering the number of personnel available to respond. Natural hazards, such as high winds and flooding, can also increase the spread of HAZMAT following an incident.

5.3.5.B. Previous Occurrences

There is no record of a major hazardous material spill or accident in the county to date. Minor incidents have occurred at fixed sites and during transportation. However, these incidents have had an insignificant impact on the community at large. The likelihood of a major event is considered to be marginal, but isolated minor incidents are a constant hazard.

Incident Response History

The National Fire Incident Reporting System reports that between January 1, 2008 and December 31, 2011 there were 176 hazardous condition calls in the county. Of these, 114 involved hazardous materials. These various incidents are depicted in Figure 5-45 below.

Figure 5-45: Hazardous Material Incidents 2008-2011[109]

Description	Frequency	Average Response Time (Minutes)
Flammable gas or liquid condition, other	3	6.67
Gasoline or other flammable liquid spill	6	3.00
Gas Leak (natural gas or LPG)	62	2.92
Chemical hazard (no spill or leak)	1	10.00
Chemical spill or leak	1	4.00
Refrigeration leak	1	2.00
Carbon monoxide incident	40	4.32

History of Release During Transportation

The U.S. Department of Transportation keeps a record of incidents that are related to the transportation of hazardous material. Figure 5-46 depicts the two events that appear in the MNDOT database for Waseca County. These events resulted in zero deaths, injuries, or damages and did not require remediation. Nor did they require any evacuations.

Figure 5-46: Transportation Related HAZMAT Events[110]

Date	Location	Transportation Mode	Commodity	HAZMAT Class
1/22/1979	Waldorf	Highway	Compound Cleaning Liquid	Corrosive Material
5/11/1984	Waldorf	Highway	Gasoline	Flammable - Combustible Liquid

5.3.5.C. FEMA Declared Disasters

There have been no federally declared disasters specific to hazardous material release.

5.3.5.D. Geographic Location

The entire county is, to some degree, at risk from HAZMAT release. The degree of risk varies upon location. Properties adjacent to highways, railroads, and fixed-site facilities and pipelines are at the greatest risk.

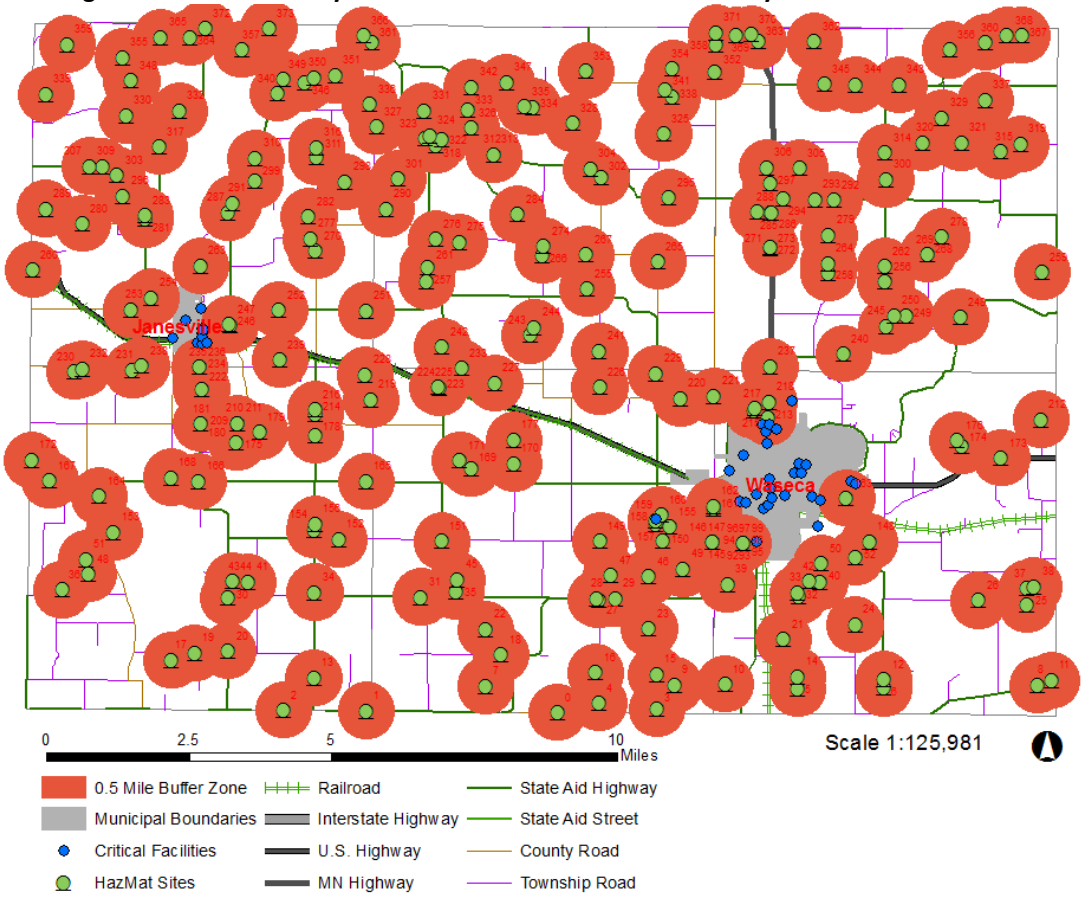
5.3.5.E. Hazard Extent

The hazard extent can vary drastically depending on the toxicity of the material(s) released, the amount released, and the location of the incident.

5.3.5.F. Vulnerability Analysis

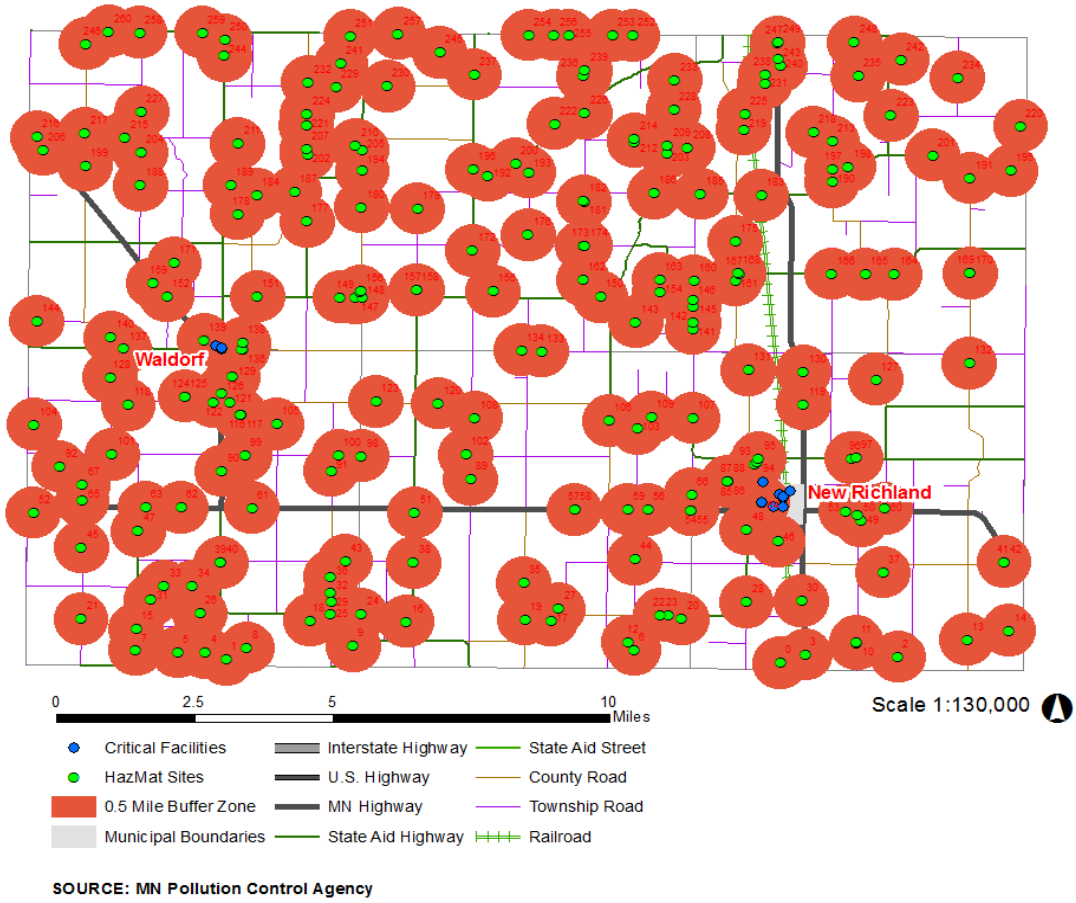
The maps below depict the vulnerability of critical facilities to hazardous material release. It is presumed that any release will have an impact area radius of a half mile. Red circles represent this half mile radius surrounding hazardous material sites.

Figure 5-47: Vulnerability of Northern Portion of Waseca County to Hazardous Materials



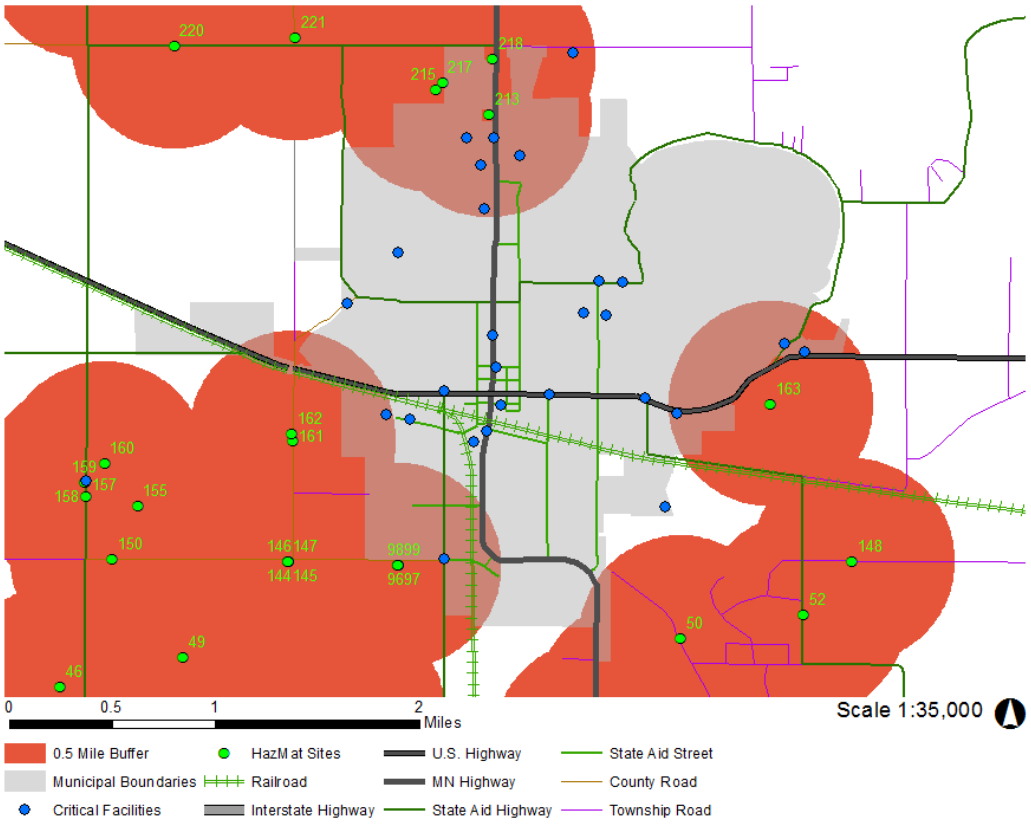
SOURCE: MN Pollution Control Agency

Figure 5-48: Vulnerability of Southern Portion of Waseca County to Hazardous Materials



SOURCE: MN Pollution Control Agency

Figure 5-49: Vulnerability of City of Waseca to Hazardous Materials

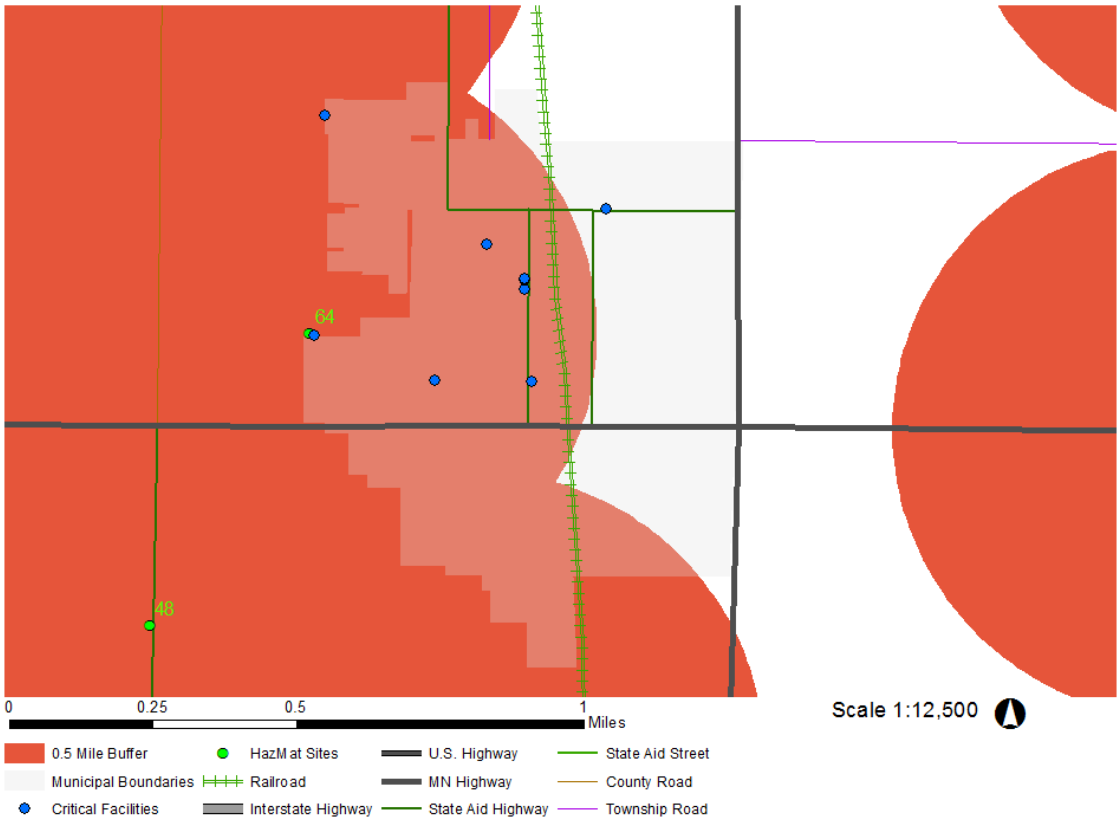


SOURCE: MN Pollution Control Agency

Figure 5-50: Vulnerability of City of Janesville to Hazardous Materials

SOURCE: MN Pollution Control Agency

Figure 5-51: Vulnerability of City of New Richland to Hazardous Materials



SOURCE: MN Pollution Control Agency

Figure 5-52: Vulnerability of City of Waldorf to Hazardous Materials

SOURCE: MN Pollution Control Agency

Critical Facilities

Figure 5-53: Critical Facilities Within 0.5 Miles of a Hazardous Material Site

Name	Type	City	Cost
Janesville Police Station	Law Enforcement	Janesville	$295,200
City of Janesville	Wastewater	Janesville	$0
City of Janesville	Wastewater	Janesville	$0
City of Janesville	Wastewater	Janesville	$0
Trinity Lutheran School	School	Janesville	$1,080,000
Janesville-Waldorf-Pemberton Elementary School	School	Janesville	$0
Janesville-Waldorf-Pemberton High School	School	Janesville	$0
City of Janesville	Potable Water	Janesville	$0
City of Waseca	Wastewater	Waseca	$40,000,000
City of Waseca	Potable Water	Waseca	$1,500,000
City of Waseca	Wastewater	Waseca	$800,000
Waseca Junior High School	School	Waseca	$10,000,000
Waseca Senior High School	School	Waseca	$14,000,000

Name	Type	City	Cost
City of Waseca	Wastewater	Waseca	$600,000
City of Waseca	Potable Water	Waseca	$1,500,000
Team Academy Charter School	School	Waseca	$0
City of Waseca	Wastewater	Waseca	$400,000
City of Waseca	Wastewater	Waseca	$60,000
City of Waseca	Potable Water	Waseca	$500,000
City of Waseca	Wastewater	Waseca	$400,000
City of Waldorf	Wastewater	Waldorf	$2,000,000
Waldorf Fire Station	Emergency Response	Waldorf	$157,200
City of Waldorf	Potable Water	Waldorf	$2,000,000
City of Waldorf	Potable Water	Waldorf	$150,000
City of New Richland	Wastewater	New Richland	$1,557,066
City of New Richland	Wastewater	New Richland	$0
Mayo Clinic Health System in New Richland	Medical Care	New Richland	$0
New Richland-Hartland-Ellendale-Geneva High School	School	New Richland	$0
New Richland Police Station	Law Enforcement	New Richland	$343,100
New Richland Fire Station	Emergency Response	New Richland	$140,900
City of New Richland	Potable Water	New Richland	$16,105
City of New Richland	Potable Water	New Richland	$664,575
City of New Richland	Potable Water	New Richland	$718,181
TOTAL			**$78,882,327**

Building Inventory

There are a total of 7,680 buildings that lie within a half mile radius of a hazardous material site. This represents approximately 48% of all buildings within the county.

5.3.6 Infectious Disease

5.3.6.A. Definition & Background

Infectious diseases are one of the leading causes of illness and death throughout the world. They are disorders caused by organisms (e.g. bacteria, viruses, fungi, parasites) which are transmitted from a source into a host and proceed to cause illness – please see Figure 5-54 for examples of commonly known infectious diseases. Infectious diseases can be transmitted person to person, via bites from insects or animals, by ingesting contaminated food or water, or through various other exposures in the environment.[111] Infectious diseases can affect humans, plants, or animals.

Figure 5-54: Examples of Bacterial, Viral, and Parasitic Diseases

Bacterial	Viral	Parasitic
• Anthrax	• AIDS	• Malaria
• Botulism	• Chickenpox	• Scabies
• Cholera	• Common cold	
• Diphtheria	• Dengue fever	
• Gonorrhea	• Ebola	
• Leprosy	• Hepatitis	
• Lyme disease	• Herpes	
• Plague	• Influenza	
• Scarlet fever	• Measles	
• Syphilis	• Mumps	
• Tetanus	• Rabies	
• Tuberculosis	• Rubella	
• Typhoid fever	• Smallpox	
• Typhus	• Viral meningitis	
	• West Nile	
	• Yellow fever	

Throughout the 19th and 20th centuries, advancements in medicine and technology and improvements in hygiene and sanitation greatly decreased the threat from infectious diseases. As a result, between 1900 and 1999 the average life expectancy in the United States increased by 29 years.[112] However, many diseases once thought to be in decline or eradicated – such as pertussis (whooping cough), tuberculosis, measles, mumps, cholera and smallpox, – have re-emerged in recent decades. In addition to these resurgent diseases, recent decades have witnessed the emergence of deadly new diseases, such as HIV/AIDS, SARS, H1N1 (swine flu), H5N1 (bird flu), West Nile Virus, Mad Cow Disease, and Ebola. Important factors influencing emergence include changes in human demographics and behavior, technology and industry, economic development and land use, globalization, microbial adaptation and evolution, and the breakdown of public health measures.[113] Due to the disturbing trend of disease resurgence and emergence the complacency of the late 20th century has given way to a renewed focus on public health.

An epidemic occurs when there is a rapid outbreak of a specific disease, where the number of cases exceeds normal expectancy. If an epidemic spreads across a wide geographic area, it becomes a pandemic. Pandemics can cause, or contribute to, major societal disturbances and economic distress. The most well known pandemic of the 20th century started in 1918. In less than two years the Spanish Flu killed between 30 and 50 million people, including 675,000 Americans.[114] Two additional global flu pandemics occurred in 1957 (Asian flu; 2 million dead globally; 70,000 Americans dead) and in 1968 (Hong Kong flu; 1 million dead globally; 33,000 Americans dead).

In 2005, the World Health Organization published guidance defining the six phases of a pandemic. These phases are depicted in Figure 5-55.

Figure 5-55: Six Phases of a Pandemic[115]

Inter-pandemic Period	
Phase 1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.
Phase 2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.
Pandemic Alert Period	
Phase 3	Human infection(s) with a new subtype but no human-to-human spread or at most rare instances of spread to a close contact.
Phase 4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.
Phase 5	Larger cluster(s) but human-to-human spread is still localized, suggesting that the virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk).
Pandemic Period	
Phase 6	Pandemic phase: increased and sustained transmission in the general population.
Post-pandemic Period	
Return to Inter-pandemic Period (Phase 1).	

Relationship to Other Hazards

Infectious disease outbreaks may occur following a major hazard event, such as an earthquake, drought, or water supply contamination event. Alternatively, an outbreak of infectious disease may impact a community's response to, and recovery from, another hazard event. For example, if a tornado was to occur during a major flu outbreak the number of available emergency responders may be much lower than normal. Additionally, medical facilities may be at capacity and unable to accommodate additional wounded persons.

5.3.6.B. Previous Occurrences

Waseca County has not seen any significant outbreaks of infectious diseases in recent years. Figure 5-56 below shows the recorded incidences of infectious diseases in Waseca County from 2003 to 2010. Also shown is the median level of occurrence for the state.

Figure 5-56: Infectious Disease Statistics 2003-2010[116]

	Waseca	Median	Waseca	Median	Waseca	Median	Waseca	Median	Waseca	Median	Waseca	Median	Waseca	Median	Waseca	Median
	2003		2004		2005		2006		2007		2008		2009		2010	
Campylobacteriosis	2	3	1	5	3	4	1	3	2	3	3	4	2	5	4	7
Chlamydia	28	17	38	21	21	21	32	23	31	24	34	31	34	30	27	38
Giardiasis	0	4	2	2	0	2	2	2	2	2	2	3	2	2	1	2
Gonorrhea	4	3	8	2	2	2	5	2	4	2	5	3	1	2	2	2
HIV	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
Lyme Disease	0	5	0	2	0	2	0	2	2	2	0	3	2	2	3	4
Salmonellosis	3	3	1	3	2	3	0	2	2	2	0	3	3	2	2	4
Syphilis - All Stages	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
West Nile	x	x	x	x	x	x	x	x	0	0	0	0	0	0	0	0

5.3.6.C. FEMA Declared Disasters

There have been no federally declared disasters specific to infectious disease.

5.3.6.D. Geographic Location

The entire county is at risk from infectious diseases.

5.3.6.E. Hazard Extent

The hazard extent varies depending on the overall health of the community, the specific characteristics of the disease, and the ability of modern medicine to treat and control the disease.

5.3.6.F. Vulnerability Analysis

Critical Facilities

As discussed above, the risk infectious disease poses to critical facilities is related to how it can impact response times and recovery from other hazard events. Given the nature of the hazard it does not pose a significant risk on its own.

5.3.7 Infrastructure Failure

5.3.7.A. Definition & Background

Infrastructure failure includes a variety of events, such as: pipeline ruptures, roads buckling under intense summer heat, leakage from wastewater treatment lagoons, electrical grid blackouts, etc. Two types of specific infrastructure failure examined in more detail in this plan are dam failure and bridge collapse.

Dam Failure

Dams may fail due to heavy flooding, inadequate design, improper operation, or a lack of maintenance. Dam failures can result in flash flooding with the possibility of significant damage to property and loss of life.[117] In order to help prevent dam failures, the Minnesota Department of Natural Resources operates its Dam Safety Program. Under this program dams are classified based on the danger to the public in the event of a failure. The DNR dam classification scheme is outlined in Figure 5-57.

Figure 5-57: Dam Classification[118]

Class	Hazard Description
I	**High Hazard** - Any loss of life or serious hazard, or damage to health, main highways, high-value industrial or commercial properties, major public utilities, or serious direct or indirect, economic loss to the public.
II	**Significant Hazard** - Possible health hazard or probable loss of high-value property, damage to secondary highways, railroads or other public utilities, or limited direct or indirect economic loss to the public other than that described in Class III.
III	**Low Hazard** - Property losses restricted mainly to rural buildings and local county and township roads which are an essential part of the rural transportation system serving the area involved.

Owners of Class I dams are required to have an Emergency Action Plan (EAP) on file with the DNR. These dams are required to be inspected annually by DNR engineers, the Army Corps of Engineers, the Natural Resource Conservation Service, the Federal Energy Regulatory Commission, or other local units of government. Class II and Class III dams are inspected less frequently.

Bridge Collapse

Bridges fail due to a lack of proper maintenance, substandard engineering, faulty materials, deliberate acts of sabotage, vehicular accidents, or extreme weather. The most common cause of bridge failure is a lack of proper maintenance. The structural integrity of every bridge in the county is inspected and graded annually. This information is used to prioritize which bridges receive maintenance and repairs. A recent study by Transportation for America found that 10.7% of bridges in Waseca County are rated as structurally deficient, compared to the state average of 8.8%[119].

Bridges have three main components: the substructure below ground, the superstructure above ground, and the road deck, which sits atop the superstructure. A bridge is considered structurally deficient if the substructure, superstructure, or deck receives a rating or 4 or less on a scale of 0 to 9[120]. Extreme temperature fluctuations and the use of salt to clear snow and ice

off bridges cause the superstructure to corrode. The 2007 collapse of the I-35W Bridge in Minneapolis is a classic example of what happens when structural deficiencies are not promptly addressed. Despite being rated as structurally deficient, MNDOT began resurfacing the deck in the summer of 2007. The added weight of construction equipment on the deck stressed the bridge beyond its breaking point, resulting in the collapse of the bridge and the death 13 people.

Relationship to other Hazards

Infrastructure failure can be a secondary result of another hazard. For example, earthquakes or deliberate sabotage can cause a dam to break. Heavy rainfall can fill a dam's reservoir beyond capacity and cause a spillover. Bridges are susceptible to damage from floods, fires, earthquakes, and vehicular accidents. Conversely, infrastructure failure can result in secondary hazards. Dam failure and waste water system failure can trigger flooding, the release of hazardous materials, and infectious disease outbreaks. Bridge collapses can also result in hazardous material release.

5.3.7.B. Previous Occurrences

There have been no reported incidents of major infrastructure failure.

5.3.7.C. FEMA Declared Disasters

There have been no federally declared disasters specific to infrastructure failure.

5.3.7.D. Geographic Location

The geographic location of this hazard is limited to the locations in the county where there are dams or bridges. See section 5.2.1.B and 5.2.1.D for a complete breakdown of the county's infrastructure of these types.

5.3.7.E. Hazard Extent

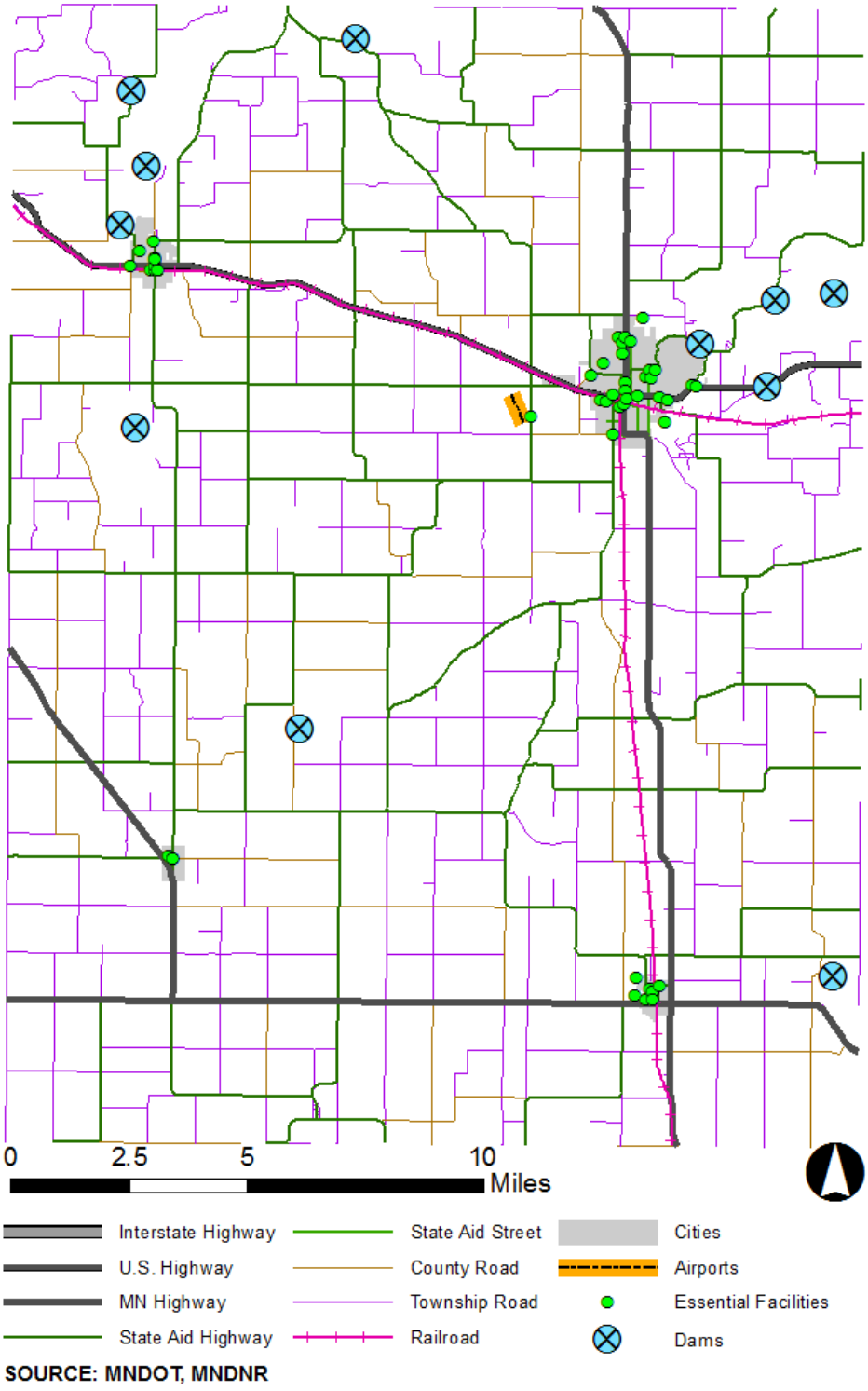
The hazard extent varies depending on infrastructure type and location, as well as the timing of failure.

5.3.7.F. Vulnerability Analysis

Critical Facilities

Dams are the only pieces of infrastructure in the county whose failure would bring with it the potential to impact other critical facilities. Figure 5-58 below shows that the dams in the county are not in close proximity to any critical facilities and thus do not pose a significant threat for loss.

Figure 5-58: Dam Proximity to Essential Facilities



5.3.8 Severe Summer Weather

5.3.8.A. Definition & Background

Waseca County experiences a variety of hazards resultant of severe summer weather. The category of severe summer weather includes: excessive heat, hail, and lightning.

Excessive Heat

Excessive heat occurs from a combination of significantly above normal temperatures and high humidity.[121] The National Weather Service's Heat Index, shown in Figure 5-59, depicts apparent temperature. In terms of excessive heat, apparent temperature is a measure of how hot it feels when relative humidity is combined with the actual air temperature. For example, an actual temperature of 86°F and a relative humidity of 90% results in an apparent temperature of 105°F. The index was devised to reflect temperatures in the shade; in direct sunlight the apparent temperature may be up to 15°F higher than those shown in Figure 5-59. The affects on the human body associated with the different Heat Index categories are shown in Figure 5-60, below. The three National Weather Service heat alerts are shown in Figure 5-61.

Figure 5-59: NOAA's National Weather Service Heat Index[122]

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	118	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | External Danger

Figure 5-60: Heat Index – Affects on the Human Body

Heat Index of 80° - 90°	Fatigue possible with prolonged exposure and/or physical activity.
Heat Index of 90°- 105°	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
Heat Index of 105°- 130°	Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
Heat Index of >130°	Heatstroke/sunstroke highly likely with continued exposure.

Figure 5-61: National Weather Service Heat Alerts[123]

Heat Advisory	Issued within 12 hours of the onset of the following conditions: heat index of at least 105°F but less than 115°F for less than 3 hours per day, or nighttime lows above 80°F for 2 consecutive days.
Excessive Heat Watch	Issued by the National Weather Service when heat indices in excess of 105°F during the day combined with nighttime low temperatures of 80°F or higher are forecast to occur for two consecutive days.
Excessive Heat Warning	Issued within 12 hours of the onset of the following criteria: heat index of at least 105°F for more than 3 hours per day for 2 consecutive days, or heat index more than 115°F for any period of time.

Excessive heat is the number one weather related killer in the United States, resulting in more fatalities each year than floods, lightning, tornadoes, and hurricanes combined.[124] One study found that there were 59 heat attributable deaths in the Minneapolis metropolitan statistical area every year, or 2.32 deaths per 100,000 people.[125] Excessive heat can result in heat cramps, heat exhaustion, and heat stroke (sunstroke). Heat becomes deadly for animals and people when it pushes a body beyond its natural ability to cool itself – typically due to over exposure, or over exercitation. People suffering from heat stroke may have a body temperature of 106^{o}F or higher. Elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergics), and persons with weight and alcohol problems are particularly susceptible to excessive heat, especially during heat waves in areas where a moderate climate usually prevails.[126]

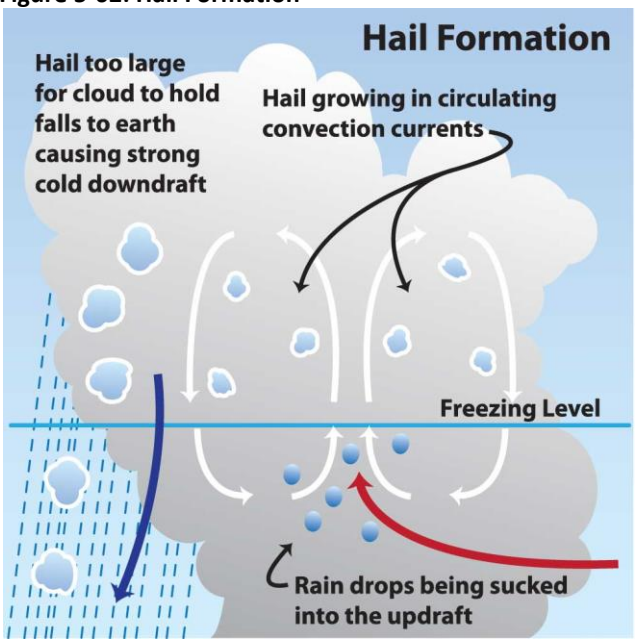
Hail

Hail is also commonly associated with thunderstorms. Hail is formed when strong updrafts within a cumulonimbus cloud carries water droplets above the freezing level. These ice pellets then collide with more uplifted water droplets until their mass becomes too great for the updraft and they fall to the ground as hailstones. See Figure 5-62, below.

Hail can vary in size from tiny, pea sized hailstones to giant, softball sized hailstones. Hail is considered severe when it reaches 0.75 of an inch in diameter. This size hailstone can do considerable damage to crops. Significant non-crop related damage can occur when hail reaches a diameter of 1.5 inches. Hailstones of this size often result in damage to automobiles, windows, and siding. Damage to roofs can occur when hail reaches 3 inches in diameter. Large hailstones can reach falling speeds of 100 to 120 miles per hour.

Each year hail causes approximately $1 billion in damages in the United States, mostly related to agricultural losses from damaged crops. In rare cases hail has been known to kill people and animals. The deadliest hailstorm on record occurred in India on April 30, 1988, killing 246 people and 1600 domesticated animals.[127]

Figure 5-62: Hail Formation[128]



Lightning[129]

Lightning is one of the oldest observed natural phenomena on earth and is most commonly associated with strong summer thunderstorms. However, lightning can result from snowstorms, hurricanes, forest fires, volcanic eruptions, and surface nuclear detonations. Lightning from thunderstorms occurs when there is a sudden movement of electrons between oppositely charged parts of a cumulonimbus cloud, or between the cloud and the ground. A series of these sudden discharges produces flashes of light, or lightning. Basically, lightning can be thought of as being similar to the electrostatic discharge a person may feel after shuffling across a carpet in socks and then touching something metallic. The National Oceanic and Atmospheric Administration approximates that in the continental United States there are an average of 20 million cloud-to-ground flashes and between 100 and 200 million cloud-to-cloud flashes annually.[130]

Lightning is one of the most deadly weather related killers in the United States. Each year it kills an estimated 60 people and injures another 300. The precise number of lightning related injuries and deaths is unknown due to the suspected underreporting of lightning related casualties. The majority of these casualties are the result of inappropriate behavior during thunderstorms and people caught outdoors during recreational or sports activities.[131] Lightning can also cause significant property damage and can result in the ignition of wildfires and structural fires.

Relationship to other Hazards

Excessive heat can weaken immune systems and increase susceptibility to infectious disease, increase the likelihood of wildfire outbreaks, intensify the severity of drought events, and contribute to infrastructure failure. Additionally, extreme heat can hinder response and recovery efforts by causing heat related illnesses among the responders.

Lightening is the primary cause of wildfire and can also trigger structural fires. Lightening can also contribute to infrastructure failure by damaging utility equipment.

5.3.8.B. Previous Occurrences

Excessive Heat

According to the National Climatic Data Center there have been eight heat events reported in Waseca County since 1995, see Figure 5-63 below. The record shows there have been nine heat attributable deaths and approximately $2 million in heat related property damage. All of the heat related property damage occurred as a result of a 1995 heat wave.

Figure 5-63: Heat Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	7/10/1995	1300	Heat Wave	2	0	$2.0 M	0
Waseca Co.	7/23/1999	10:00 AM	Excessive Heat	1	0	0	0
Waseca Co.	7/29/1999	3:00 AM	Excessive Heat	0	0	0	0
Waseca Co.	7/30/2001	9:00 AM	Excessive Heat	0	0	0	0
Waseca Co.	8/1/2001	12:00 AM	Excessive Heat	1	0	0	0
Waseca Co.	8/4/2001	12:00 PM	Excessive Heat	5	0	0	0
Waseca Co.	7/30/2006	10:00 AM	Heat	0	0	0	0
Waseca Co.	7/18/2011	12:00 PM	Excessive Heat	0	0	0	0

Hail

According to the National Climatic Data Center there have been 90 hail events reported in Waseca County since 1958, see Figure 5-64 below. There have been no deaths or injuries related to hail. There has been no significant property or crop damage recorded by the NCDC. The largest recorded diameter for a hailstone in the county is 2.5 inches. Hailstones of this size fell on June 15, 1970 and Aril 14, 1977.

Figure 5-64: Hail Events

Location or County	Date	Time	Hailstone Diameter	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	8/14/1958	2115	1.75 in.	0	0	0	0
Waseca Co.	5/15/1968	1600	1.75 in.	0	0	0	0
Waseca Co.	7/23/1968	300	1.25 in.	0	0	0	0
Waseca Co.	6/15/1970	1830	2.50 in.	0	0	0	0

Location or County	Date	Time	Hailstone Diameter	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	6/18/1974	1800	1.50 in.	0	0	0	0
Waseca Co.	7/5/1975	2100	0.75 in.	0	0	0	0
Waseca Co.	6/25/1976	1845	1.00 in.	0	0	0	0
Waseca Co.	4/14/1977	1520	2.50 in.	0	0	0	0
Waseca Co.	5/15/1977	2330	0.75 in.	0	0	0	0
Waseca Co.	4/3/1978	2000	1.50 in.	0	0	0	0
Waseca Co.	4/3/1978	2000	1.75 in.	0	0	0	0
Waseca Co.	8/1/1978	2020	1.00 in.	0	0	0	0
Waseca Co.	6/28/1979	1800	1.50 in.	0	0	0	0
Waseca Co.	6/27/1980	1735	1.00 in.	0	0	0	0
Waseca Co.	9/20/1980	1735	1.75 in.	0	0	0	0
Waseca Co.	4/27/1981	2345	1.50 in.	0	0	0	0
Waseca Co.	4/27/1981	2345	1.75 in.	0	0	0	0
Waseca Co.	6/14/1981	1942	1.75 in.	0	0	0	0
Waseca Co.	6/14/1981	1958	1.00 in.	0	0	0	0
Waseca Co.	6/23/1981	1800	1.75 in.	0	0	0	0
Waseca Co.	6/28/1981	1757	1.75 in.	0	0	0	0
Waseca Co.	7/21/1981	1720	1.75 in.	0	0	0	0
Waseca Co.	7/6/1982	1628	1.50 in.	0	0	0	0
Waseca Co.	3/26/1985	1010	1.75 in.	0	0	0	0
Waseca Co.	7/3/1985	2043	1.00 in.	0	0	0	0
Waseca Co.	9/8/1985	1741	1.00 in.	0	0	0	0
Waseca Co.	9/8/1985	1741	1.00 in.	0	0	0	0
Waseca Co.	6/15/1986	2035	1.75 in.	0	0	0	0
Waseca Co.	8/21/1987	103	1.00 in.	0	0	0	0
Waseca Co.	8/4/1989	1718	1.00 in.	0	0	0	0
Waseca Co.	8/7/1994	1930	1.75 in.	0	0	0	0
Waterville	8/7/1994	1935	2.00 in.	0	0	0	0
New Richland	7/5/1997	4:57 PM	0.75 in.	0	0	0	0
Janesville	7/18/1997	7:10 AM	0.75 in.	0	0	0	0
Waseca	4/6/1998	5:35 PM	0.75 in.	0	0	0	0
Janesville	5/18/1998	10:47 PM	0.75 in.	0	0	0	0
Waseca	6/25/1998	12:25 AM	0.75 in.	0	0	0	0
Matawan	6/27/1998	4:55 PM	0.75 in.	0	0	0	0
Waldorf	6/27/1998	4:55 PM	1.00 in.	0	0	0	0
New Richland	6/27/1998	5:25 PM	0.75 in.	0	0	0	0
Waseca	9/7/1999	5:16 PM	1.00 in.	0	0	0	0
Waseca	5/1/2001	4:28 PM	1.00 in.	0	0	0	0

Location or County	Date	Time	Hailstone Diameter	Deaths	Injuries	Property Damage	Crop Damage
Waseca	5/1/2001	4:46 PM	1.00 in.	0	0	0	0
Waseca	5/1/2001	4:50 PM	1.25 in.	0	0	0	0
Waseca	5/1/2001	5:05 PM	1.50 in.	0	0	0	0
New Richland	5/9/2001	6:33 PM	1.00 in.	0	0	0	0
New Richland	6/18/2001	7:10 PM	1.75 in.	0	0	0	0
Waseca	6/18/2001	7:13 PM	0.75 in.	0	0	0	0
Janesville	5/8/2002	1:55 PM	0.75 in.	0	0	0	0
Waseca	5/8/2002	2:00 PM	1.75 in.	0	0	0	0
Waseca	6/12/2002	3:14 PM	0.88 in.	0	0	0	0
Janesville	6/25/2002	11:45 PM	0.75 in.	0	0	0	0
Waseca	7/30/2002	3:55 PM	1.75 in.	0	0	0	0
St Mary	7/30/2002	4:50 PM	1.00 in.	0	0	0	0
New Richland	6/11/2004	4:32 PM	0.88 in.	0	0	0	0
Otisco	6/11/2004	4:40 PM	0.75 in.	0	0	0	0
Waseca	6/12/2004	5:43 PM	0.75 in.	0	0	0	0
Waseca	6/27/2005	5:52 PM	0.75 in.	0	0	0	0
Waldorf	6/27/2005	5:55 PM	0.75 in.	0	0	0	0
Waseca	6/27/2005	6:33 PM	1.00 in.	0	0	0	0
Waseca	6/29/2005	9:20 PM	0.75 in.	0	0	0	0
New Richland	5/8/2006	7:48 PM	1.25 in.	0	0	0	0
New Richland	6/14/2006	8:00 AM	1.00 in.	0	0	0	0
Janesville	7/19/2006	9:55 PM	0.88 in.	0	0	0	0
Waseca	7/19/2006	10:10 PM	1.00 in.	0	0	0	0
Waldorf	8/24/2006	7:34 PM	0.75 in.	0	0	0	0
Janesville	9/26/2006	8:06 PM	0.75 in.	0	0	0	0
New Richland	10/4/2006	1:30 AM	0.88 in.	0	0	0	0
Waldorf	3/21/2007	17:53 PM	0.88 in.	0	0	0	0
New Richland	3/21/2007	18:11 PM	1.00 in.	0	0	0	0
Janesville	3/21/2007	18:54 PM	0.75 in.	0	0	0	0
Janesville	4/30/2007	15:30 PM	0.88 in.	0	0	0	0
Waseca	5/23/2007	15:30 PM	0.75 in.	0	0	0	0
Janesville	6/20/2007	21:53 PM	1.00 in.	0	0	0	0
Waseca	8/11/2007	21:16 PM	1.00 in.	0	0	0	0
Waseca	8/11/2007	21:18 PM	0.88 in.	0	0	0	0
Janesville	8/21/2007	18:23 PM	0.75 in.	0	0	0	0
Palmer	5/31/2008	14:21 PM	0.75 in.	0	0	0	0
Palmer	5/31/2008	14:24 PM	0.75 in.	0	0	0	0
Waseca	5/31/2008	14:58 PM	1.00 in.	0	0	0	0

Location or County	Date	Time	Hailstone Diameter	Deaths	Injuries	Property Damage	Crop Damage
Janesville	7/17/2008	8:30 AM	1.00 in.	0	0	0	0
Waseca	7/17/2008	8:45 AM	1.00 in.	0	0	0	0
Waseca	7/17/2008	9:00 AM	1.00 in.	0	0	0	0
Palmer	6/17/2009	18:30 PM	0.88 in.	0	0	0	0
Palmer	6/17/2009	19:02 PM	0.75 in.	0	0	0	0
Waseca	6/17/2009	19:05 PM	0.75 in.	0	0	0	0
Alma City	4/12/2010	19:38 PM	0.75 in.	0	0	0	0
Waldorf	6/25/2010	18:45 PM	1.75 in.	0	0	0	0
New Richland	6/25/2010	19:06 PM	1.75 in.	0	0	0	0
Waldorf	9/15/2010	17:00 PM	1.25 in.	0	0	0	0

Lightning

According to the National Climatic Data Center there have been two lightning events reported in Waseca County. Both events were the product of the same storm system which occurred on June 29, 2005 at 9:20PM. There were no reported injuries, deaths, or property/crop damage associated with either event.

5.3.8.C. FEMA Declared Disasters

There have been no federally declared disasters specific to lightning, hail, or excessive heat.

5.3.8.D. Geographic Location

The entire county is at risk from severe summer weather.

5.3.8.E. Hazard Extent

The extent of the damage that may be caused by severe summer weather fluctuates depending on the timing, physical location, and magnitude of the event.

5.3.8.F. Vulnerability Analysis

Critical Facilities

All critical facilities in the county are at vulnerable to the negative effects of this hazard. However, some facilities will be more susceptible than others. Those buildings without air conditioning will be especially impacted by extreme heat. Taller buildings will be more likely to be damaged by lightening than their shorter neighbors. Finally, buildings with tin roofs or that are pre-fabricated will likely suffer a disproportionate amount of damage from a hail event.

5.3.9 Severe Winter Weather

5.3.9.A. Definition & Background

Waseca County experiences a variety of hazards resultant of severe winter weather. The category of severe winter weather includes: blizzards, extreme cold, heavy snow, ice storms, and winter storms.

Blizzards

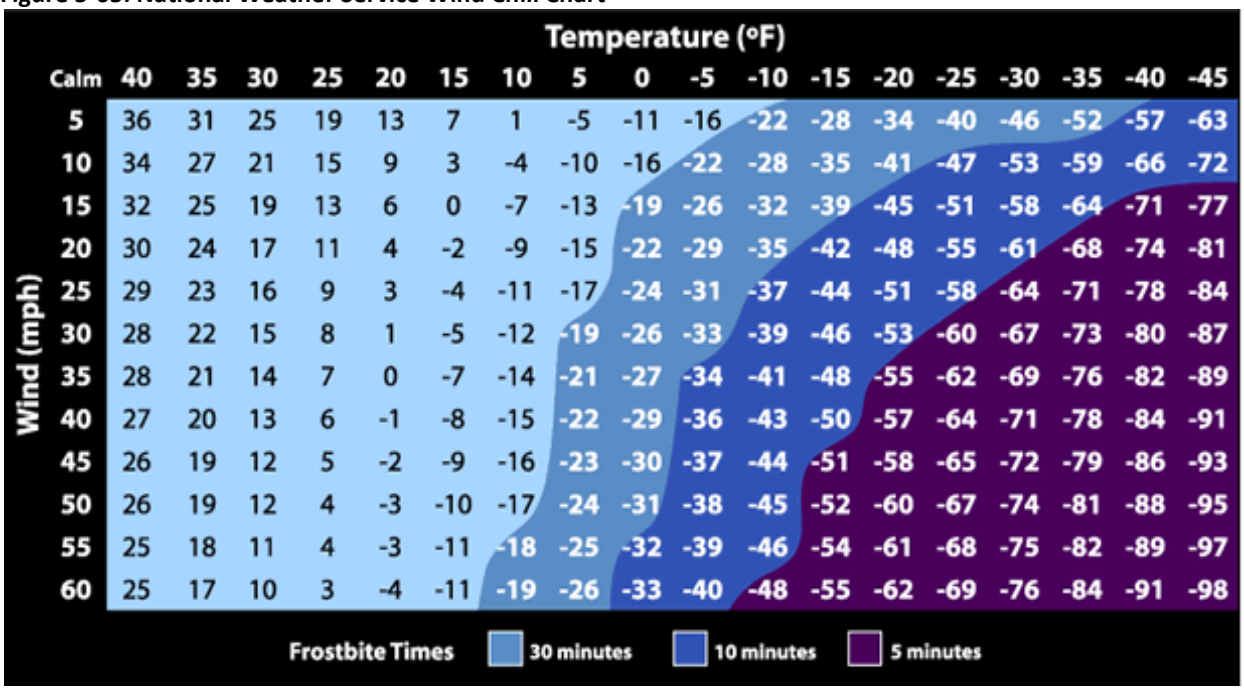
The National Weather Service defines a blizzard as a storm which contains large amounts of snow, with winds in excess of 35 mph and visibilities of less than 1/4 mile for at least 3 hours.[132] Heavy snowfall is commonly associated with blizzards. However, blizzards can result from blowing snow, or the movement of snow that has already fallen to the ground. The movement of snow (falling or blowing) and the decreased visibility can result in "whiteout" conditions. Blizzards are most dangerous when the air is dry and the snow is powdery, or fluffy.

Another threat associated with blizzards is drifting snow. Snow drifts can seriously impede travel during and after a blizzard. Additionally, it is not uncommon for blizzards to be accompanied by extreme cold. For these reasons travel during a blizzard is extremely dangerous and is not recommended unless absolutely necessary.

Extreme Cold

Extreme cold occurs from a combination of low temperatures and strong winds. The National Weather Service's Wind Chill Index, show in Figure 5-65, depicts apparent temperatures. In terms of extreme cold, apparent temperature is a measure of how cold it feels when wind speed is combined with the actual air temperature. For example, an actual air temperature of 5^{o}F and a wind speed of 30 miles per hour results in an apparent temperature of -19^{o}F. At this temperature it takes approximately 30 minutes for human skin to freeze. The index assumes there is no impact from the sun (i.e. a clear night sky); in direct sunlight the apparent temperatures may be warmer than those shown in Figure 5-65.[133]

Figure 5-65: National Weather Service Wind Chill Chart[134]



The Wind Chill Index has a calm wind threshold of three mph; below three mph conditions are considered to be calm and wind chill is not applicable. In the past, the National Weather Service's Weather Forecasting Offices had no means of issuing an alert for dangerously cold conditions with little or no wind. In 2011, the National Weather Service in Minnesota, North Dakota, and South Dakota initiated an experimental procedure whereby an *Extreme Cold Warning* may be issued during situations where actual temperatures reach *Wind Chill Warning* criteria under calm conditions.[135] In Minnesota an *Extreme Cold Warning* may be issued when actual air temperature reaches -30°F or lower.[136]

Two of the greatest threats related to extreme cold are frostbite and hypothermia. Frostbite is damage to tissue as a result of exposure to intense cold. Frostbite typically occurs when the body cools to the point of needing to restrict blood circulation to its core in order to protect its vital organs. This results in less blood flowing to the body's extremities. Prolonged exposure can lead to severe tissue damage. The most frostbite prone areas of the body include toes, fingers, nose, and ears. Hypothermia occurs when the human body temperature drops below 95°F (normal body temperature is 98.6°F). The condition is a result of the body losing heat faster than it can produce it. Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Hypothermia is most likely at very cold temperatures, but it can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat, or submersion in cold water.[137] Severe hypothermia can result in heart and/or respiratory failure and eventual death. Frostbite and hypothermia are not only dangerous to humans, but also pets and livestock.

Heavy Snow

The National Weather Service generally defines heavy snow as snowfall accumulating to 4 inches or more in depth in 12 hours or less, or snowfall accumulating to 6 inches or more in depth in 24 hours or less.[138] Heavy snow can cause extensive damage to property. For example, a roof may suffer structural damage or collapse due to the excessive weight of accumulated snow. Heavy snow can also be dangerous to human life. Each year there are instances of fatalities related to the shoveling or removal of snow following heavy snow events.

Ice Storms[139]

The term ice storm is used by the National Weather Service to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. This accumulation of ice makes walking and driving extremely dangerous. In Minnesota, an *Ice Storm Warning* is issued for ice accumulation of greater than 0.25 inches.[140]

Winter Storms

A winter storm is a weather event that has more than one significant hazard (extreme cold, heavy snow, ice, etc.) and meets or exceeds local/regional warning criteria for at least one of the hazard elements.[141] For example, if heavy snow and extreme cold happen concurrently the event will be listed singularly as a winter storm and will not be listed individually.

Relationship to other Hazards

Heavy precipitation during the winter can contribute to spring flooding and infrastructure failure. Additionally, severe winter weather can cause major disruption to lifeline utilities. For example, ice storms can knock down power lines and blizzards can impede the delivery of home heating fuels. Heavy snow can cause roof collapse. Extreme cold can hinder response and recover efforts following a major hazard event.

5.3.9.B. Previous Occurrences

Blizzards

According to the National Climatic Data Center, there have been seven blizzard events in Waseca County since 1996.

Figure 5-66: Blizzard Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	1/28/1996	11:00 PM	Blizzard	0	0	0	0
Waseca Co.	1/15/1997	4:00 PM	Blizzard	0	0	0	0
Waseca Co.	2/11/2003	11:00 AM	Blizzard	0	0	0	0
Waseca Co.	1/21/2005	10:00 AM	Blizzard	0	0	0	0
Waseca Co.	12/8/2009	8:00 AM	Blizzard	0	0	0	0
Waseca Co.	1/25/2010	9:00 AM	Blizzard	0	0	0	0
Waseca Co.	12/10/2010	19:30 PM	Blizzard	0	0	0	0

Extreme Cold

According to the National Climatic Data Center, there have been ten extreme cold events in Waseca County since 1997, see Figure 5-67. Extreme cold resulted in one reported death on January 15, 1994. The NCDC records show no other injuries or damage to property or crops as a result of extreme cold.

Figure 5-67: Extreme Cold Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	1/15/1994	100	Extreme Cold	1	0	0	0
Waseca Co.	1/18/1996	6:00 PM	Extreme Wind Chill	0	0	0	0
Waseca Co.	1/31/1996	4:00 AM	Extreme Cold	0	0	0	0
Waseca Co.	2/1/1996	12:00 AM	Extreme Cold	0	0	0	0
Waseca Co.	12/24/1996	6:00 PM	Extreme Cold	0	0	0	0
Waseca Co.	1/15/1997	5:00 PM	Extreme Wind Chill	0	0	0	0
Waseca Co.	2/10/2008	2:00 AM	Cold / Wind Chill	0	0	0	0
Waseca Co.	2/19/2008	21:00 PM	Cold / Wind Chill	0	0	0	0
Waseca Co.	12/15/2008	12:00 AM	Extreme Cold / Wind Chill	0	0	0	0
Waseca Co.	1/14/2009	18:00 PM	Cold / Wind Chill	0	0	0	0

Heavy Snow

According to the National Climatic Data Center, in Waseca County there have been 17 heavy snow events since 1994, see Figure 5-68. The NCDC records show no deaths, injuries, or damage to property or crops as a result of heavy snow events.

Figure 5-68: Heavy Snow Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	1/26/1994	2000	Heavy Snow	0	0	0	0
Waseca Co.	4/28/1994	400	Heavy Snow & Ice	0	0	0	0
Waseca Co.	11/27/1994	500	Heavy Snow & Ice	0	0	0	0
Waseca Co.	3/6/1995	0	Heavy Snow	0	0	0	0
Waseca Co.	12/8/1995	300	Heavy Snow	0	0	0	0
Waseca Co.	1/10/1996	1:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	1/17/1996	2:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	1/25/1996	2:00 AM	Heavy Snow	0	0	0	0
Waseca Co.	3/23/1996	9:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	11/20/1996	2:00 AM	Heavy Snow	0	0	0	0
Waseca Co.	11/22/1996	9:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	12/14/1996	1:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	1/1/1999	11:00 AM	Heavy Snow	0	0	0	0
Waseca Co.	1/19/2000	5:30 AM	Heavy Snow	0	0	0	0
Waseca Co.	1/14/2007	14:00 PM	Heavy Snow	0	0	0	0
Waseca Co.	3/31/2008	9:00 AM	Heavy Snow	0	0	0	0
Waseca Co.	4/1/2008	12:00 AM	Heavy Snow	0	0	0	0

Ice Storms

According to the National Climatic Data Center, there have been two ice storm events in Waseca County since 1996, see Figure 5-69. The NCDC records show no deaths, injuries, or damage to property or crops as a result of ice storm events.

Figure 5-69: Ice Storm Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	11/14/1996	10:00 PM	Ice Storm	0	0	0	0
Waseca Co.	1/4/1998	2:00 PM	Ice Storm	0	0	0	0

Winter Storms

According to the National Climatic Data Center, in Waseca County there have been 33 winter storm events since 1996, see Figure 5-70. A winter storm resulted in one death on December 23, 1996. The NCDC records show no other injuries or damage to property or crops as a result of winter storms.

Figure 5-70: Winter Storm Events

Location or County	Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	12/23/1996	5:00 AM	Winter Storm	1	0	0	0
Waseca Co.	1/22/1997	4:00 AM	Winter Storm	0	0	0	0
Waseca Co.	3/13/1997	12:00 AM	Winter Storm	0	0	0	0
Waseca Co.	1/17/1999	9:00 PM	Winter Storm	0	0	0	0
Waseca Co.	1/22/1999	1:00 AM	Winter Storm	0	0	0	0
Waseca Co.	3/8/1999	12:30 AM	Winter Storm	0	0	0	0
Waseca Co.	12/28/2000	2:00 AM	Winter Storm	0	0	0	0
Waseca Co.	1/29/2001	7:00 PM	Winter Storm	0	0	0	0
Waseca Co.	2/24/2001	5:00 PM	Winter Storm	0	0	0	0
Waseca Co.	3/8/2002	6:00 PM	Winter Storm	0	0	0	0
Waseca Co.	3/14/2002	8:00 AM	Winter Storm	0	0	0	0
Waseca Co.	12/9/2003	3:00 AM	Winter Storm	0	0	0	0
Waseca Co.	1/24/2004	9:00 PM	Winter Storm	0	0	0	0
Waseca Co.	2/1/2004	2:00 AM	Winter Storm	0	0	0	0
Waseca Co.	3/5/2004	12:00 AM	Winter Storm	0	0	0	0
Waseca Co.	1/1/2005	10:00 AM	Winter Storm	0	0	0	0
Waseca Co.	3/18/2005	12:00 AM	Winter Storm	0	0	0	0
Waseca Co.	3/12/2006	12:00 PM	Winter Storm	0	0	0	0
Waseca Co.	12/31/2006	11:30 AM	Winter Storm	0	0	0	0
Waseca Co.	2/23/2007	23:00 PM	Winter Storm	0	0	0	0
Waseca Co.	3/1/2007	12:00 AM	Winter Storm	0	0	0	0
Waseca Co.	12/1/2007	8:00 AM	Winter Storm	0	0	0	0
Waseca Co.	12/9/2008	1:00 AM	Winter Storm	0	0	0	0
Waseca Co.	12/20/2008	13:00 PM	Winter Storm	0	0	0	0
Waseca Co.	1/12/2009	18:00 PM	Winter Storm	0	0	0	0
Waseca Co.	12/23/2009	17:00 PM	Winter Storm	0	0	0	0
Waseca Co.	1/25/2010	9:00 AM	Winter Storm	0	0	0	0
Waseca Co.	2/7/2010	12:00 PM	Winter Storm	0	0	0	0
Waseca Co.	11/12/2010	22:00 PM	Winter Storm	0	0	0	0
Waseca Co.	12/3/2010	11:00 AM	Winter Storm	0	0	0	0
Waseca Co.	12/15/2010	21:00 PM	Winter Storm	0	0	0	0
Waseca Co.	12/20/2010	8:30 AM	Winter Storm	0	0	0	0
Waseca Co.	2/20/2011	7:00 AM	Winter Storm	0	0	0	0

5.3.9.C. FEMA Declared Disasters

There have been three federally declared disasters related to severe winter weather in Waseca County, see Figure 5-71.

Figure 5-71: Severe Winter Weather Disaster Declarations (1953-2011)[142]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-1158	1/3/1997 - 2/3/1997	1/16/1997	Severe Winter Storms / Blizzards	Clinton	Public
DR-1151	11/14/1996 - 11/30/1996	1/7/1997	Severe Storms / Heavy Snow	Clinton	Public
DR-929	10/31/1991 - 11/29/1991	12/26/1991	Ice Storm	GHW Bush	Public

5.3.9.D. Geographic Location

The entire county is at risk from severe summer weather.

5.3.9.E. Hazard Extent

The extent of the damage that may be caused by severe winter weather fluctuates depending on the timing, physical location, and magnitude of the event.

5.3.9.F. Vulnerability Analysis

Critical Facilities

Similar to infectious disease, the greatest risk to critical facilities from severe winter weather is how the hazard can impact response times and recovery from other hazard events. If a fire, hazardous material release, or other significant hazard occurred in the midst of a blizzard or ice storm, emergency response time would be greatly increased and the damage from the event would be much higher.

5.3.10 Tornado

5.3.10.A. Definition & Background

Tornadoes are one of the most violent of all storms. A tornado is essentially a rapidly rotating vortex of air that that extends ground-ward from a cumulonimbus could.[143] Strictly speaking, a tornado is a funnel cloud until it reaches the ground. Once a funnel cloud reaches the ground it becomes a tornado. Tornadoes usually form in association with severe thunderstorms, but can also occur as a result of hurricanes or wildfires.

Minnesota lies within what is referred to as Tornado Alley. Tornado Alley is a tornado prone region that runs north from the Texas panhandle to Nebraska and northeast to southern Minnesota. This area is the site for the meteorological phenomenon known as the dryline, where cold, dry polar air moving south from Canada converges with warm, humid tropical air moving north from the Gulf of Mexico.[144] If the cold front is fast moving and the warm air is unstable, thunderstorms and tornadoes can result.

Although records only date back to the 1950 and the methodology for reporting tornadoes has changed numerous times since then, it is estimated that approximately 1,000 tornadoes occur every year in the United States. Between 1950 and 2011, there were 1,684 tornadoes in Minnesota, averaging 27 per year.[145] However, the average for 1991 to 2010 is 45 tornadoes per year in Minnesota.[146] The trend of increased tornado activity holds true for much of the rest of the United States also. Scientists are uncertain whether the actual numbers of tornadoes per year is increasing (perhaps due to climate change), or simply if more tornadoes are being reported each year due to advancements in technology.

In Minnesota, 89% of tornadoes occur from May to August and are most probable between 2PM and 9PM.[147] However, tornadoes have historically occurred as early as March and as late as November. Tornadoes can also occur at any time of day. This relative unpredictability makes tornadoes one of the most dangerous natural hazards in Minnesota.

The severity of damage resulting from a tornado is measured by the Fujita scale, which assigns tornadoes a numerical value based on wind speeds, see Figure 5-72.

Figure 5-72: Fujita Tornado Scale[148]

Fujita Number	Wind Speed	Estimated Width	Estimated Length	Probability 1953-1989 (Avg # per yr; % per yr)	Description of Potential Damage
F0 Gale	40-72 mph	6-17 yards	0.3-0.9 miles	218; 29%	Light damage: some damage to chimneys, tree branches broken, shallow-rooted trees blown over, signs damaged.
F1 Moderate	73-112 mph	18-55 yards	1-3.1 miles	301; 40%	Moderate damage: roof surfaces peeled off, mobile homes pushed off foundations or overturned, moving automobiles pushed off roads.
F2 Significant	113-157 mph	56-175 yards	3.2-9.9 miles	175; 23%	Considerable damage: roofs torn off of buildings, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light-object missiles generated.
F3 Severe	158-206 mph	176-566 yards	10-31 miles	43; 6%	Severe damage: roofs and walls torn from well-constructed homes, trains overturned, most trees uprooted, heavy vehicles lifted off roads and thrown.
F4 Devastating	207-260 mph	0.3-0.9 miles	32-99 miles	10; 1%	Devastating damage: well-constructed houses leveled, structures with weak foundations blown off some distance, cars thrown, large missiles generated.
F5 Incredible	261-318 mph	1-3.1 miles	100-315 miles	1; 0.002%	Incredible damage: strong frame houses lifted off foundations and carried considerable distances to disintegrate, automobile sized missiles fly through air in excess of 100 yards, trees debarked.

Relationship to other Hazards

Tornadoes, like earthquakes, can trigger a variety of secondary hazards, including fires, infrastructure failure, flooding, hazardous material release, etc. Tornadoes can also impede the efficiency of response and recovery efforts by damaging essential facilities and infrastructure networks.

5.3.10.B. Previous Occurrences[149]

According to the National Climatic Data Center, there have been 18 tornado events reported in Waseca County since 1961, see Figure 5-73 below. In total, tornados have killed six people, injured 24, and caused an estimated $28,809,000 in property damages. The majority of this destruction was the result of a single tornado which occurred in 1967. On Sunday April 30 of that year an F4 tornado struck the county. The 1967 tornado killed six people, injured 22 others, and caused an estimated $25 million in property damages. It touched down for 18.2 miles and left a path of destruction 267 yards wide. The last tornado to strike the county was an F0, occurred on June 17, 2009, and resulted in only light damage to property.

Figure 5-73: Tornado Events

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage
Waseca Co.	5/14/1961	1716	Tornado	F2	0	1	250K
Waseca Co.	6/9/1963	1745	Tornado	F2	0	0	250K
Waseca Co.	4/30/1967	1800	Tornado	F2	0	0	25.0M
Waseca Co.	4/30/1967	1815	Tornado	F3	0	0	25.0M
Waseca Co.	4/30/1967	1900	Tornado	F4	6	22	25.0M
Waseca Co.	4/29/1970	1732	Tornado	F2	0	0	250K
Waseca Co.	6/18/1973	635	Tornado	F0	0	0	3K
Waseca Co.	7/23/1973	1926	Tornado	F0	0	0	3K
Waseca Co.	7/23/1973	1950	Tornado	F1	0	0	25K
Waseca Co.	8/1/1978	1930	Tornado	F1	0	1	2.5M
Waseca Co.	6/28/1979	1810	Tornado	F1	0	0	250K
Waseca Co.	6/13/1983	2031	Tornado	F0	0	0	25K
Waseca Co.	6/4/1984	1437	Tornado	F1	0	0	250K
Waseca Co.	6/7/1984	1820	Tornado	F1	0	0	3K
Waseca Co.	7/14/1987	1835	Tornado	F0	0	0	0K
Janesville	8/7/1994	1930	Tornado	F1	0	0	0
Waterville	7/14/2003	7:55 PM	Tornado	F0	0	0	0
Waseca	6/17/2009	7:02 PM	Tornado	F0	0	0	0K

Additionally, there have also been 11 funnel clouds reported in the county since 1994, see Figure 5-74 below.

Figure 5-74: Funnel Cloud Events

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage
Waseca	5/24/1994	1758	Funnel Clouds	N/A	0	0	0
New Richland	6/30/1994	2110	Funnel Cloud	N/A	0	0	0
Waseca	8/7/1994	1925	Funnel Cloud	N/A	0	0	0
New Richland	7/20/1997	6:30 PM	Funnel Cloud	N/A	0	0	0
Waldorf	5/1/2001	4:30 PM	Funnel Cloud	N/A	0	0	0
Otisco	5/1/2001	4:41 PM	Funnel Cloud	N/A	0	0	0
Waseca Muni Arpt	7/14/2003	8:07 PM	Funnel Cloud	N/A	0	0	0
New Richland	6/11/2004	4:31 PM	Funnel Cloud	N/A	0	0	0
Janesville	6/27/2005	5:30 PM	Funnel Cloud	N/A	0	0	0
Waldorf	8/24/2006	7:23 PM	Funnel Cloud	N/A	0	0	0
Waseca	6/17/2009	7:15 PM	Funnel Cloud	N/A	0	0	0K

5.3.10.C. FEMA Declared Disasters

There has been one federally declared disaster related to tornadoes in Waseca County, see Figure 5-75.

Figure 5-75: Tornado Hazard Disaster Declarations (1953-2011)[150]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-993	5/6/1993 - 8/22/1993	6/11/1993	Flooding / Severe Storms / Tornadoes	Clinton	Individual & Public

5.3.10.D. Geographic Location

The entire county is at risk from tornadoes.

5.3.10.E. Hazard Extent

The extent of the damage that may be caused by tornadoes varies according to wind speed and the location/path of the tornado. A community hit directly by a powerful tornado can incur catastrophic destruction and loss of life.

5.3.10.F. Vulnerability Analysis

Critical Facilities

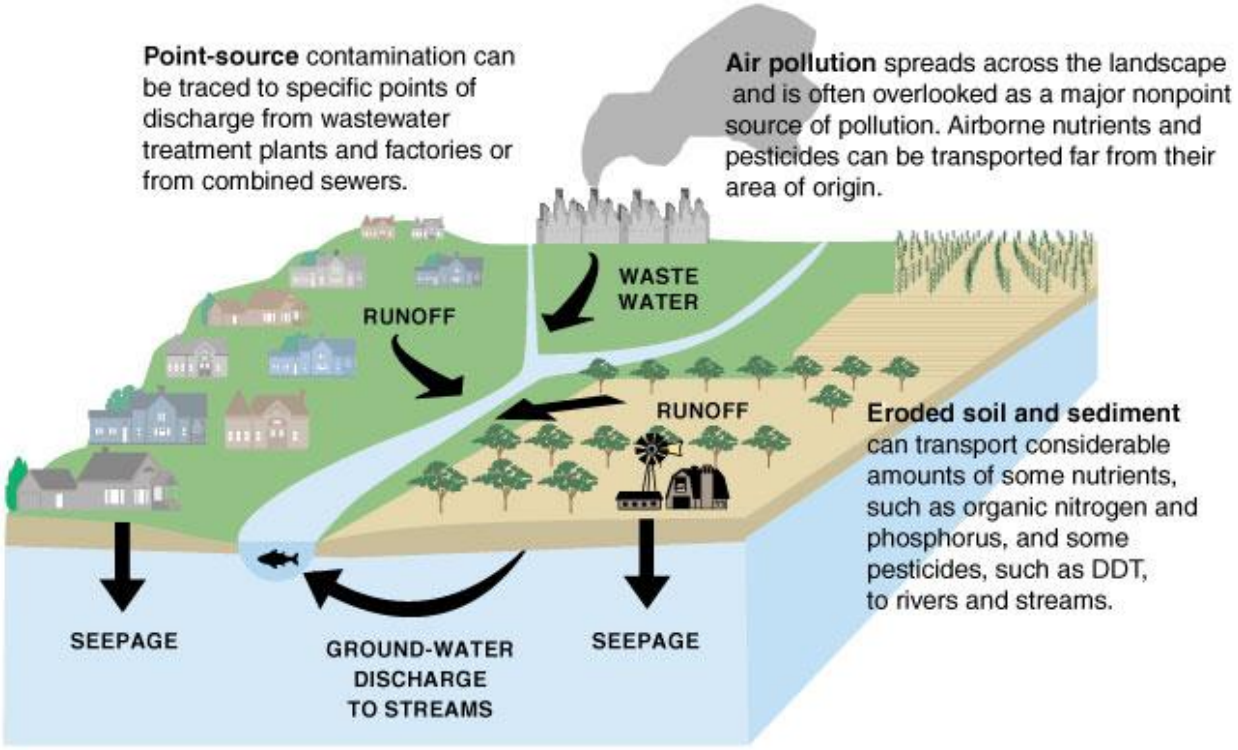
The entire population and all structures within the county are vulnerable to tornadoes. The level of vulnerability varies depending on the durability of structures, the availability of shelter, and human behavior during a tornado event. Since it is impossible to determine when and where a tornado will touch down, the specific level or risk for critical facilities in the county cannot be quantified.

5.3.11 Water Supply Contamination

5.3.11.A. Definition & Background

Water supply contamination is the introduction of pollutants into groundwater and surface water supplies. Contaminants can enter the water supply due to point and nonpoint source pollution. Point source pollution has its source in a well-defined location, such as the pipe through which a sewage treatment plant or a factory discharges waste into a body of water.[151] Nonpoint source pollution has its source over a large area. An example of nonpoint source pollution is agricultural runoff that flows into the county ditch system and leaches into the groundwater. Figure 5-76 depicts the various sources of water supply contamination.

Figure 5-76: Groundwater Contamination Sources[152]



Water supply contamination may result from a variety of point and nonpoint sources, including: wastewater systems failure, agricultural runoff, industrial pollution, hazardous material releases, dam failure, and the improper disposal of household chemicals.

Contamination due to wastewater treatment systems failure is an ongoing concern. These systems are vital to our model of civilization, but they also pose a potential risk to public health. The improper treatment or release of untreated sewage could result in surface and groundwater pollution, as well as outbreaks of infectious disease. The scale of damage differs depending on the size of the system. For example, a failure of an individual septic system would be minor compared to the failure of a municipal treatment facility.

Another likely source of contamination is the application of agricultural fertilizers. Phosphorus is an essential nutrient for all plants to grow. When excess amounts enter surface water bodies they enable large algal blooms to occur. These blooms deplete the oxygen supply within the water, killing fish and other species and making the water unsafe for consumption.

Manure runoff from feedlots is also a concern. Heavy rainfall can cause feedlot sewage lagoons to overflow and contaminate nearby surface water bodies or ground water wells. Feedlot manure contains high amounts of *E. coli* and antibiotic drugs, which can result in infectious disease outbreaks.

Relationship to other Hazards

Biological pollutants can contribute to the spread of infectious diseases. Chemical pollutants can impact public health and have the potential to damage wastewater treatment infrastructure. Fire is a possible secondary hazard in the event of contamination if the substance is flammable.

5.3.11.B. Previous Occurrences

There has been no substantial occurrence of water supply contamination within Waseca County. Isolated issues have arisen on individual residential wells but are not within the scope of this planning process.

5.3.11.C. FEMA Declared Disasters

There have been no federally declared disasters specific to water supply contamination.

5.3.11.D. Geographic Location

The entire county is at risk for water supply contamination.

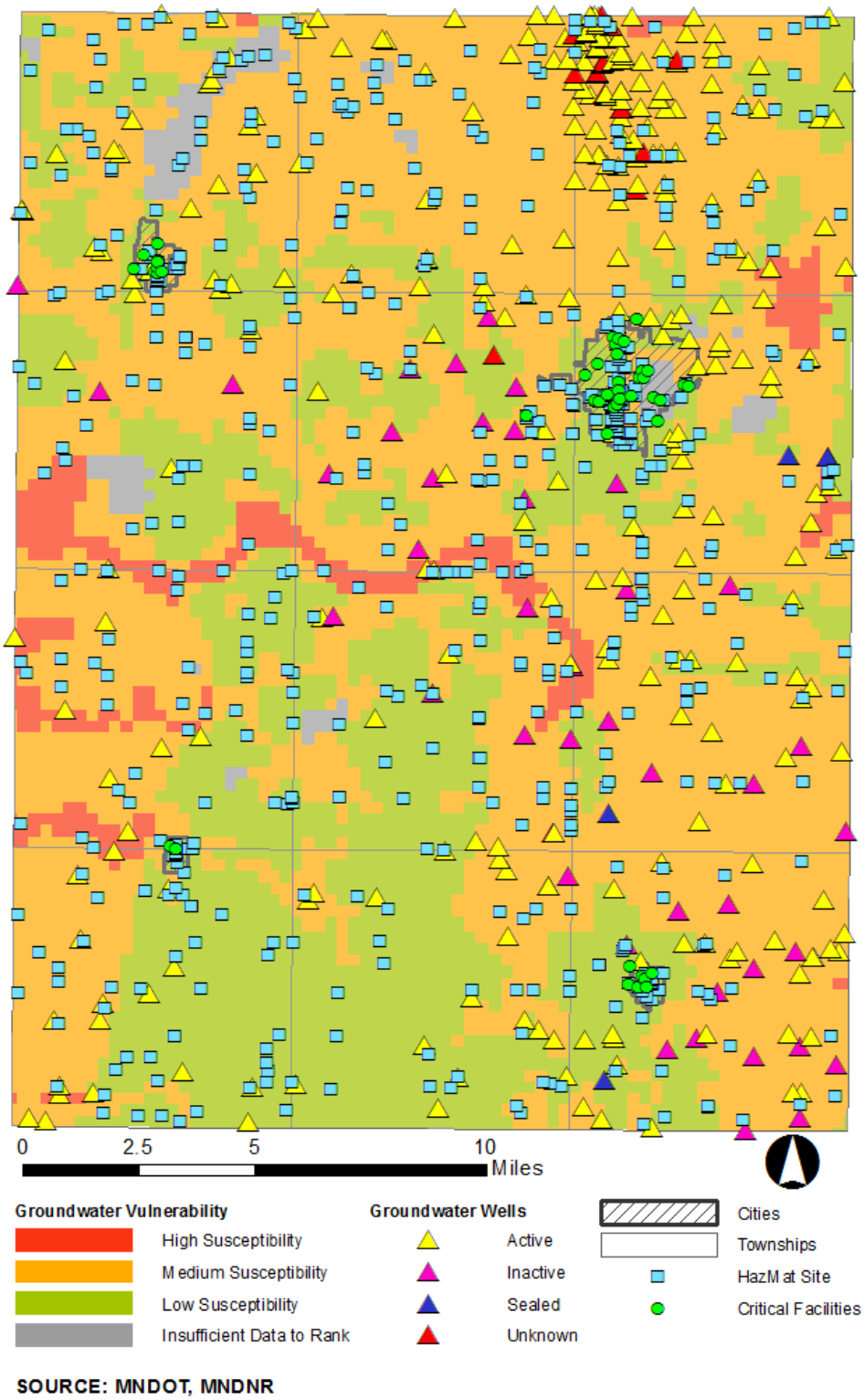
5.3.11.E. Hazard Extent

The hazard extent can vary greatly depending on the level of contamination, how soon the incident is identified, and the effect the contamination has on those exposed to it.

5.3.11.F. Vulnerability Analysis

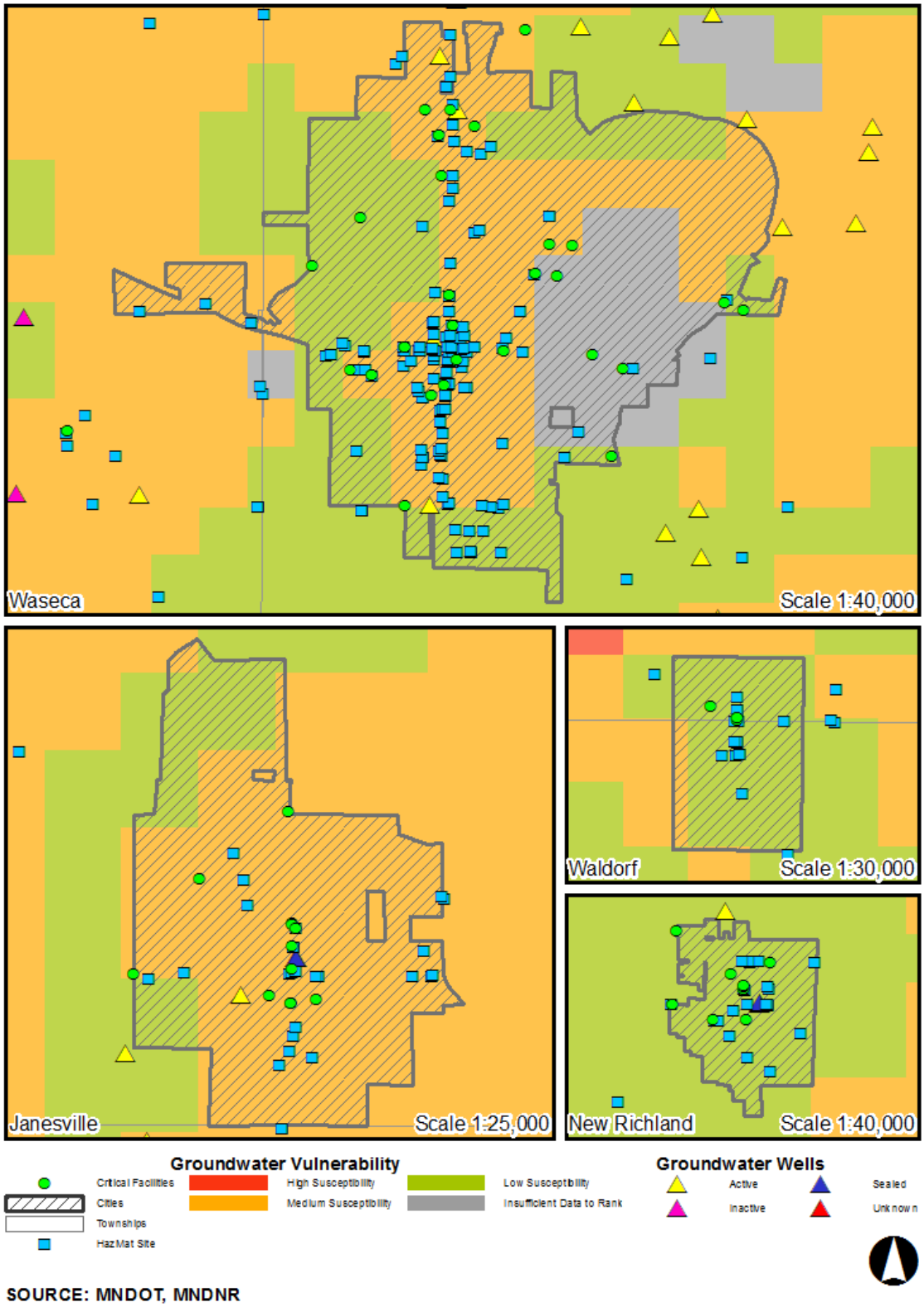
The following maps depict the groundwater vulnerability of the county. The MNDNR classifies vulnerability to groundwater contamination from surface sources and wells based off the makeup and depth of the layers of rock, till, and soil found above aquifers. Low vulnerability areas are not easily contaminated from surface land uses. Medium vulnerability areas are more susceptible to seepage of surface pollutants into groundwater aquifers. High vulnerability area can be easily contaminated by surface land use activities. It is important to note that all areas can be easily contaminated if surface pollutants are transported below ground via open wells. Land uses in areas of high vulnerability and near open wells should be restricted to activities that will not leech pollutants into the ground.

Figure 5-77: Vulnerability of Waseca County to Water Supply Contamination



SOURCE: MNDOT, MNDNR

Figure 5-78: Vulnerability of Waseca County Cities to Water Supply Contamination



SOURCE: MNDOT, MNDNR

Critical Facilities

Figure 5-79: Critical Facilities Exposed to Groundwater Contamination

Name	Type	City	Cost	Risk Level
City of Janesville	Wastewater	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
Janesville Police Station	Law Enforcement	Janesville	$295,200	Medium
City of Janesville	Potable Water	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
City of Janesville	Wastewater	Janesville	$0	Medium
Mayo Clinic Health System in Janesville	Medical Care	Janesville	$0	Medium
Janesville Fire Station	Emergency Response	Janesville	$170,000	Medium
Trinity Lutheran School	School	Janesville	$1,080,000	Medium
Janesville-Waldorf-Pemberton Elementary School	School	Janesville	$0	Medium
Janesville-Waldorf-Pemberton High School	School	Janesville	$0	Medium
City of Janesville	Potable Water	Janesville	$0	Medium
City of Waseca	Wastewater	Waseca	$40,000,000	Medium
City of Waseca	Potable Water	Waseca	$1,500,000	Medium
City of Waseca	Potable Water	Waseca	$1,500,000	Medium
City of Waseca	Wastewater	Waseca	$800,000	Medium
Sacred Heart Elementary	School	Waseca	$2,000,000	Medium
Waseca Junior High School	School	Waseca	$10,000,000	Medium
City of Waseca	Potable Water	Waseca	$1,500,000	Medium
Waseca Senior High School	School	Waseca	$14,000,000	Medium
City of Waseca	Wastewater	Waseca	$600,000	Medium
Waseca Police Station (Emergency Operations Center)	Law Enforcement	Waseca	$1,850,000	Medium
Mayo Clinic Health System in Waseca	Medical Care	Waseca	$6,798,500	Medium
City of Waseca	Potable Water	Waseca	$1,500,000	Medium
Waseca County Sherriff's Department (Emergency Operations Center)	Law Enforcement	Waseca	$3,226,100	Medium
Waseca Fire Station	Emergency Response	Waseca	$1,097,800	Medium
Team Academy Charter School	School	Waseca	$0	Medium
Central Intermediate School	School	Waseca	$12,000,000	Medium
City of Waseca	Wastewater	Waseca	$400,000	Medium
City of Waseca	Wastewater	Waseca	$1,000,000	Medium
City of Waseca	Wastewater	Waseca	$30,000	Medium
City of Waseca	Potable Water	Waseca	$500,000	Medium

Name	Type	City	Cost	Risk Level
City of Waldorf	Wastewater	Waldorf	$2,000,000	Low
Waldorf Fire Station	Emergency Response	Waldorf	$157,200	Low
City of Waldorf	Potable Water	Waldorf	$2,000,000	Low
City of Waldorf	Potable Water	Waldorf	$150,000	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
City of Waseca	Wastewater	Waseca	$1,500,000	Low
City of New Richland	Wastewater	New Richland	$1,557,066	Low
City of New Richland	Wastewater	New Richland	$0	Low
Mayo Clinic Health System in New Richland	Medical Care	New Richland	$0	Low
New Richland-Hartland-Ellendale-Geneva High School	School	New Richland	$0	Low
New Richland Police Station	Law Enforcement	New Richland	$343,100	Low
New Richland Fire Station	Emergency Response	New Richland	$140,900	Low
City of New Richland	Potable Water	New Richland	$16,105	Low
City of New Richland	Potable Water	New Richland	$664,575	Low
City of New Richland	Potable Water	New Richland	$718,181	Low
City of New Richland	Wastewater	New Richland	$0	Low
City of Waseca	Wastewater	Waseca	$600,000	Low
City of Waseca	Wastewater	Waseca	$400,000	Low
TOTAL			**$112,694,727**	

Building Inventory

There are 387 buildings that are in areas of high vulnerability to groundwater contamination, 8,572 buildings in areas of medium vulnerability to groundwater contamination, and 4,312 buildings in areas of low vulnerability to groundwater contamination.

5.3.12 Windstorm

5.3.12.A. Definition & Background [153]

Windstorms can be difficult to separate from several other natural hazards. For example, high winds are a common component of hurricanes, thunderstorms, tornadoes, and even wildfires. However, windstorms can also be a significant hazard all by themselves. A windstorm may be defined as a high wind event with either sustained wind speeds of 40 miles per hour or greater lasting for one hour, or winds of 58 miles per hour or greater for any duration of time.[154] It is not unusual for wind speeds during a severe windstorm to exceed those of a hurricane and approach those of a weak to moderate tornado.

Windstorms are most commonly associated with the outflow of winds caused by a collision of a cold front into a warm air mass. To differentiate windstorm activity from tornadoes, the phrase straight-line winds is typically employed (in contrast to a tornado's rotational winds). Straight-line winds can result from gust front and downdraft activity. A gust front is the leading edge of rain-cooled air that clashes with warmer inflow air and is characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm.[155] A downdraft is a localized column of air that sinks rapidly towards the ground. Strong downdrafts are known as downbursts. A downburst can have wind speeds over 100 miles per hour and can leave a path of destruction hundreds of miles long. Concentrated downbursts, called microbursts, are normally less than 2.5 miles in diameter and last for only a few minutes. However, microbursts are capable of generating devastating winds with speeds up to 168 miles per hour.[156]

The destruction resulting from severe windstorms can rival that from a moderate tornado, see Figure 5-80. In is not unusual for damage thought to be caused by a tornado to actually have been caused by high winds. Damage from windstorms is much more common than damage from tornadoes and accounts for over half of all weather related damage reports in the lower 48 states.[157] High winds can exert positive, negative, and internal changes in air pressure. Positive air pressure (pushing walls, doors, and windows inward) and negative air pressure (pulling building components and surfaces outward) can affect the windward side of structures and objects. Changes in internal pressure can result in considerable damage to the leeward side of structures. Furthermore, debris carried by high winds can result in property damage and loss of life.

Figure 5-80: Potential Damage from High Winds[158]

Wind Speed (mph)	Potential Damage
30-44	Trees in motion. Light-weight loose objects (e.g., lawn furniture) tossed or toppled.
45-57	Large trees bend; twigs, small limbs break, and a few larger dead or weak branches may break. Old/weak structures (e.g., sheds, barns) may sustain minor damage (roof, doors). Building partially under construction may be damaged. A few loose shingles removed from houses. Carports may be uplifted; minor cosmetic damage to mobile homes and pool lanai cages.
58-74	Large limbs break; shallow rooted trees pushed over. Semi-trucks overturned. More significant damage to old/weak structures. Shingles, awnings removed from houses; damage to chimneys and antennas; mobile homes, carports incur minor structural damage; large billboard signs may be toppled.

75-89	Widespread damage to trees with trees broken/uprooted. Mobile homes may incur more significant structural damage; be pushed off foundations or overturned. Roof may be partially peeled off industrial/commercial/ warehouse buildings. Some minor roof damage to homes. Weak structures (e.g., farm buildings, airplane hangars) may be severely damaged.
90+	Many large trees broken and uprooted. Mobile homes severely damaged; moderate roof damage to homes. Roofs partially peeled off homes and buildings. Moving automobiles pushed off dry roads. Barns, sheds demolished.

Due to the deteriorating condition of many older homes, the prevalence of manufactured and modular homes, and the lack of uniform building codes for wind resistant construction, the amount of property damage and loss of life associated with windstorms is expected to increase over time. Another factor in this trend is the cost of durable construction; while it is technically possible to build a structure capable of withstanding extremely high winds, doing so is not financially possible for the vast majority of Americans. This has led many to urge for the construction of safe rooms in residential and other structures. This approach offers increased protection for a substantially lower cost. Guidelines for wind resistant structures are based on FEMA's Wind Zone rating system. Waseca County falls entirely within Wind Zone IV, where winds can reach speeds of 250 miles per hour.

5.3.12.B. Previous Occurrences

According to the National Climatic Data Center, there have been 82 wind related events in Waseca County since 1968, including 13 high wind events and 69 thunderstorm wind events. The fasted reported wind speed was 86 knots (99 miles per hour) and occurred on May 19, 1996. In total, these windstorms caused zero fatalities, two injuries, and an estimated $12.4 million in property damages. Two events account for the great majority of these damages: the May 19, 1996 event, which caused $4 million in damages, and an event that occurred on April 7, 2001, which caused $8 million in damages and had wind speeds of 69 knots (79 miles per hour).

Figure 5-81: Previous Occurrences of Windstorms

Location	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	5/15/1968	1600	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	8/6/1968	1730	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	6/15/1970	1830	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	4/20/1974	1945	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	9/10/1975	2205	Tstm Wind	60 kts.	0	0	0	0
Waseca Co.	5/15/1977	2330	Tstm Wind	61 kts.	0	0	0	0
Waseca Co.	7/6/1977	1045	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	9/12/1978	800	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	6/19/1979	2015	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	6/19/1979	2035	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	7/22/1979	1639	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	8/18/1980	30	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	8/18/1980	30	Tstm Wind	56 kts.	0	0	0	0

Location	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	9/20/1980	1745	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	4/30/1981	1320	Tstm Wind	61 kts.	0	0	0	0
Waseca Co.	6/13/1981	2145	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	6/14/1981	510	Tstm Wind	58 kts.	0	0	0	0
Waseca Co.	5/4/1982	1605	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	6/30/1983	2000	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	4/26/1984	1945	Tstm Wind	50 kts.	0	0	0	0
Waseca Co.	6/4/1984	1455	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	7/14/1984	1353	Tstm Wind	60 kts.	0	0	0	0
Waseca Co.	7/14/1984	1502	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	4/26/1986	2213	Tstm Wind	59 kts.	0	0	0	0
Waseca Co.	4/26/1986	2230	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	7/10/1987	40	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	7/10/1987	110	Tstm Wind	79 kts.	0	0	0	0
Waseca Co.	7/27/1987	1727	Tstm Wind	70 kts.	0	0	0	0
Waseca Co.	7/27/1987	1743	Tstm Wind	63 kts.	0	0	0	0
Waseca Co.	8/15/1987	2325	Tstm Wind	74 kts.	0	0	0	0
Waseca Co.	6/2/1990	1030	Tstm Wind	61 kts.	0	0	0	0
Waseca Co.	6/27/1990	1120	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	9/7/1990	610	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	5/28/1991	845	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	8/7/1991	1932	Tstm Wind	0 kts.	0	0	0	0
Waseca Co.	8/18/1993	700	Tstm Wind	0 kts.	0	0	0	0
Southern Minnesota	4/15/1994	900	High Wind	0 kts.	0	0	0	0
New Richland	6/17/1994	1810	Tstm Wind	0 kts.	0	0	50K	0
Waldorf	6/30/1994	2105	Tstm Wind	0 kts.	0	0	5K	0
Waseca Co.	11/18/1994	700	High Wind	52 kts.	0	0	0	0
Waseca	7/14/1995	1655	Tstm Wind	52 kts.	0	0	0	0
Waldorf	7/27/1995	930	Tstm Wind	70 kts.	0	0	0	0
Waldorf	7/27/1995	939	Tstm Wind	82 kts.	0	0	0	0
Otisco	7/27/1995	958	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	2/10/1996	9:00 AM	High Wind	48 kts.	0	0	0	0
Waseca	5/19/1996	12:38 AM	Tstm Wind	86 kts.	0	0	4M	0
Waseca Co.	10/29/1996	9:00 PM	High Wind	64 kts.	0	0	0	0
Waseca Co.	4/6/1997	7:00 AM	High Wind	51 kts.	0	0	0	0
New Richland	6/27/1998	5:20 PM	Tstm Wind	61 kts.	0	0	0	0
Waseca	6/27/1998	5:29 PM	Tstm Wind	56 kts.	0	0	0	0

Location	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Waseca Co.	11/10/1998	12:00 PM	High Wind	60 kts.	0	2	0	0
Waseca Co.	3/17/1999	11:00 AM	High Wind	55 kts.	0	0	0	0
Matawan	6/5/1999	7:45 PM	Tstm Wind	57 kts.	0	0	0	0
Waseca Co.	4/5/2000	9:00 PM	High Wind	64 kts.	0	0	0	0
Waseca Co.	4/7/2001	8:00 AM	High Wind	69 kts.	0	0	8M	0
Janesville	5/28/2002	12:54 PM	Tstm Wind	52 kts.	0	0	0	0
Janesville	6/25/2002	11:45 PM	Tstm Wind	50 kts.	0	0	0	0
Waseca Muni Arpt	6/25/2002	11:58 PM	Tstm Wind	50 kts.	0	0	0	0
New Richland	7/4/2003	1:25 AM	Tstm Wind	50 kts.	0	0	0	0
Waseca	7/4/2003	1:30 AM	Tstm Wind	52 kts.	0	0	0	0
Janesville	8/21/2003	1:30 AM	Tstm Wind	60 kts.	0	0	50K	0
Waseca Co.	4/18/2004	1:00 PM	High Wind	52 kts.	0	0	0	0
Janesville	4/18/2004	7:07 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	6/11/2004	4:20 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	6/11/2004	4:25 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	12/12/2004	6:00 AM	High Wind	40 kts.	0	0	0	0
Waseca	6/8/2005	2:45 AM	Tstm Wind	52 kts.	0	0	0	0
New Richland	6/20/2005	2:55 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	6/27/2005	6:25 PM	Tstm Wind	52 kts.	0	0	0	0
Otisco	6/29/2005	9:17 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	6/29/2005	9:19 PM	Tstm Wind	52 kts.	0	0	0	0
Janesville	8/9/2005	2:45 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	8/9/2005	3:45 PM	Tstm Wind	55 kts.	0	0	0	0
Waseca	7/19/2006	8:40 AM	Tstm Wind	52 kts.	0	0	0	0

Location	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Waldorf	9/16/2006	9:40 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca Co.	5/6/2007	8:45 AM	High Wind	35 kts.	0	0	0	0
Matawan	7/3/2007	17:26 PM	Tstm Wind	52 kts.	0	0	0	0
Waseca	8/11/2007	21:15 PM	Tstm Wind	60 kts.	0	0	0	0
New Richland	6/17/2010	19:00 PM	Tstm Wind	56 kts.	0	0	0	0
Waseca	6/26/2010	20:44 PM	Tstm Wind	52 kts.	0	0	0	0
Waldorf	8/31/2010	15:57 PM	Tstm Wind	56 kts.	0	0	250K	0
Waseca Co.	10/26/2010	14:00 PM	High Wind	54 kts.	0	0	0	0

5.3.12.C. FEMA Declared Disasters

There have been no federally declared disasters specific to windstorms in Waseca County.

5.3.12.D. Geographic Location

The entire county is at risk from windstorms.

5.3.12.E. Hazard Extent

The extent of damage depends on the speed of the wind and the design and durability of structures.

5.3.12.F. Vulnerability Analysis

Critical Facilities

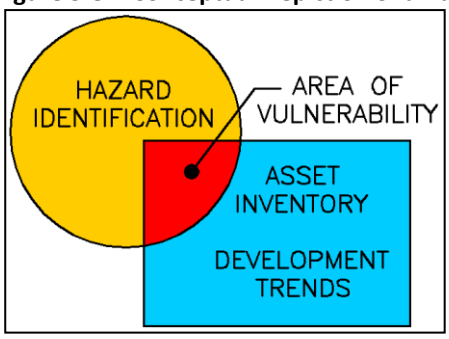
Similar to the potential damage from severe summer weather, the effect of windstorms on critical facilities will depend entirely on the quality of their construction and the construction of the buildings surrounding them.

5.4 VULNERABILITY ASSESSMENT BY JURISDICTION

The Calculated Priority Risk Index (CPRI) is a tool used to assess hazards based on an indexing system that considers probability, magnitude/severity, warning time, and duration. The CPRI value is obtained by assigning varying degrees of risk to each of the four categories for each hazard, and then calculating an index value based on a weighting scheme. For this update, the mitigation team evaluated the updated hazards and developed new CPRI values. The results of that re-evaluation are summarized in Figure 5-84.

The vulnerability assessment builds upon the previously developed hazard information by identifying the community assets and development trends and intersecting them with the hazard profiles to assess the potential amount of damage that could be caused by each hazard event. This concept is generally illustrated by Figure 5-82.

Figure 5-82: Conceptual Depiction of a Vulnerability Analysis



5.4.1 Definitions of CPRI Categories

Probability

A guide to predict how often a random event will occur. Annual probabilities are expressed between 0.001 or less (low) up to 1 (high). An annual probability of 1 predicts that a natural hazard will occur at least once per year.

Magnitude/Severity

Indicates the impact to a community through potential fatalities, injuries, property losses, and/or losses of services. The vulnerability assessment gives information that is helpful in making this determination for each community.

Warning Time

Plays a factor in the ability to prepare for a potential disaster and to warn the public. The assumption is that more warning time allows for more emergency preparations and public information.

Duration

Relates to the span of time local, state, and/or federal assistance will be necessary to prepare, respond, and recover from a potential disaster event.

5.4.2 CPRI Ratings

The following ratings are provided as a tool for local governments to analyze their risks. The CPRI ratings should not be construed as a precise way for determining risk. The ratings are a way to quantify and summarize the information from the risk and vulnerability assessment. Local input is also part of the rating since the ratings are done as part of the mitigation team. The CPRI Ratings are coded by color to act as one of the components to prioritize mitigation actions:

Figure 5-83: CPRI Ratings

CPRI Rating Range	Priority
3.00 – 4.00	High
2.00 – 2.99	Medium
1.00 – 1.99	Low
0.00 – 0.99	Negligible

5.4.3 CPRI Rating By Jurisdiction

Ratings were determined using methodology provided by HSEM and with input from local jurisdictions. Input for the unincorporated areas was provided by the county, which was combined with input from each of the four cities to create the county total CPRI rating.

Figure 5-84: Waseca County (Total) CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Tornadoes	Likely	Catastrophic	< 6 Hours	> 1 Week	3.55
Fire	Highly Likely	Critical	< 6 Hours	< 24 Hours	3.50
Hazardous Material Release	Likely	Catastrophic	< 6 Hours	< 1 Week	3.45
Severe Summer Weather	Highly Likely	Critical	6-12 Hours	< 1 Week	3.45
Severe Winter Weather	Highly Likely	Critical	6-12 Hours	< 1 Week	3.45
Flooding	Likely	Critical	6-12 Hours	> 1 Week	3.10
Water Supply Contamination	Possibly	Catastrophic	< 6 Hours	< 1 Week	3.00
Windstorms	Likely	Critical	6-12 Hours	< 1 Week	3.00
Infrastructure Failure	Possibly	Critical	< 6 Hours	> 1 Week	2.80
Drought	Possibly	Critical	> 24 Hours	> 1 Week	2.35
Infectious Disease	Possibly	Critical	> 24 Hours	> 1 Week	2.35
Earthquake	Unlikely	Limited	< 6 Hours	< 24 Hours	1.85

Figure 5-85: City of Janesville CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Flooding	Likely	Limited	6-12 Hours	> 1 Week	2.80
Fire	Likely	Limited	< 6 Hours	< 24 Hours	2.75
Severe Summer Weather	Likely	Limited	6-12 Hours	< 1 Week	2.70
Severe Winter Weather	Likely	Limited	6-12 Hours	< 1 Week	2.70
Infrastructure Failure	Likely	Negligible	< 6 Hours	> 1 Week	2.65
Tornadoes	Possibly	Limited	< 6 Hours	> 1 Week	2.50
Hazardous Material Release	Possibly	Limited	< 6 Hours	< 1 Week	2.40
Windstorms	Possibly	Limited	6-12 Hours	< 1 Week	2.25
Drought	Possibly	Limited	> 24 Hours	> 1 Week	2.05
Infectious Disease	Possibly	Limited	> 24 Hours	> 1 Week	2.05
Water Supply Contamination	Unlikely	Limited	< 6 Hours	< 1 Week	1.95
Earthquake	Unlikely	Negligible	< 6 Hours	< 24 Hours	1.55

Figure 5-86: City of New Richland CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Severe Summer Weather	Highly Likely	Limited	6-12 Hours	< 1 Week	3.15
Severe Winter Weather	Highly Likely	Limited	6-12 Hours	< 1 Week	3.15
Infrastructure Failure	Likely	Limited	< 6 Hours	> 1 Week	2.95
Tornadoes	Possibly	Critical	< 6 Hours	> 1 Week	2.80
Fire	Likely	Limited	< 6 Hours	< 24 Hours	2.75
Windstorms	Likely	Limited	6-12 Hours	< 1 Week	2.70
Flooding	Possibly	Critical	6-12 Hours	> 1 Week	2.65
Water Supply Contamination	Unlikely	Catastrophic	< 6 Hours	< 1 Week	2.55
Hazardous Material Release	Unlikely	Critical	< 6 Hours	< 1 Week	2.25
Infectious Disease	Unlikely	Limited	> 24 Hours	> 1 Week	1.60
Earthquake	Unlikely	Negligible	< 6 Hours	< 24 Hours	1.55
Drought	Unlikely	Negligible	> 24 Hours	> 1 Week	1.30

Figure 5-87: City of Waldorf CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Hazardous Material Release	Highly Likely	Catastrophic	< 6 Hours	< 1 Week	3.90
Tornadoes	Likely	Catastrophic	< 6 Hours	> 1 Week	3.55
Fire	Highly Likely	Critical	< 6 Hours	< 24 Hours	3.50
Severe Summer Weather	Highly Likely	Critical	6-12 Hours	< 1 Week	3.45
Severe Winter Weather	Highly Likely	Critical	6-12 Hours	< 1 Week	3.45
Windstorms	Highly Likely	Critical	6-12 Hours	< 1 Week	3.45
Infrastructure Failure	Possibly	Critical	< 6 Hours	> 1 Week	2.80
Water Supply Contamination	Possibly	Critical	< 6 Hours	< 1 Week	2.70
Flooding	Possibly	Limited	6-12 Hours	> 1 Week	2.35
Drought	Possibly	Limited	> 24 Hours	> 1 Week	2.05
Infectious Disease	Possibly	Limited	> 24 Hours	> 1 Week	2.05
Earthquake	Unlikely	Negligible	< 6 Hours	< 24 Hours	1.55

Figure 5-88: City of Waseca CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Fire	Highly Likely	Critical	< 6 Hours	< 24 Hours	3.50
Tornadoes	Likely	Critical	< 6 Hours	> 1 Week	3.25
Water Supply Contamination	Possibly	Catastrophic	< 6 Hours	< 1 Week	3.00
Hazardous Material Release	Possibly	Catastrophic	< 6 Hours	< 1 Week	3.00
Severe Summer Weather	Likely	Critical	6-12 Hours	< 1 Week	3.00
Severe Winter Weather	Likely	Critical	6-12 Hours	< 1 Week	3.00
Infrastructure Failure	Possibly	Critical	< 6 Hours	> 1 Week	2.80
Windstorms	Likely	Limited	6-12 Hours	< 1 Week	2.70
Infectious Disease	Possibly	Catastrophic	> 24 Hours	> 1 Week	2.65
Flooding	Possibly	Limited	6-12 Hours	> 1 Week	2.35
Drought	Possibly	Limited	> 24 Hours	> 1 Week	2.05
Earthquake	Unlikely	Limited	< 6 Hours	< 24 Hours	1.85

Figure 5-89: Waseca County (Unincorporated Areas Only) CPRI Hazard Ratings

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score
Tornadoes	Likely	Catastrophic	< 6 Hours	> 1 Week	3.55
Flooding	Likely	Catastrophic	6-12 Hours	> 1 Week	3.40
Drought	Likely	Catastrophic	> 24 Hours	> 1 Week	3.10
Infectious Disease	Likely	Catastrophic	> 24 Hours	> 1 Week	3.10
Fire	Likely	Critical	< 6 Hours	< 24 Hours	3.05
Severe Summer Weather	Likely	Critical	6-12 Hours	< 1 Week	3.00
Severe Winter Weather	Likely	Critical	6-12 Hours	< 1 Week	3.00
Windstorms	Likely	Critical	6-12 Hours	< 1 Week	3.00
Infrastructure Failure	Possibly	Critical	< 6 Hours	> 1 Week	2.80
Water Supply Contamination	Possibly	Critical	< 6 Hours	< 1 Week	2.70
Hazardous Material Release	Possibly	Critical	< 6 Hours	< 1 Week	2.70
Earthquake	Unlikely	Limited	< 6 Hours	< 24 Hours	1.85

6.0 MITIGATION STRATEGIES

The goal of mitigation is to minimize the impact from hazard events on the County. This applies to property damage, loss of life, and the economic disruption that can accompany the most serious of disasters. Identifying which hazards are the most likely to adversely impact the County and quantifying the risk they pose is only part of the picture of hazard mitigation. The next step is identifying specific mitigation goals and strategies that can be pursued at the County and city levels in order to achieve the goal of disaster resistant communities.

6.1 COMMUNITY CAPABILITY ASSESSMENT

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities listed in Section 3.0 of this plan.

6.1.1 NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Waseca County and three of the four communities within all participate in the National Flood Insurance Program. The only community to not do so is the City of Waldorf. There are FEMA Mapped High Risk Areas within the County; however, none of these areas overlap with the four communities that make up the majority of the County population. The latest Flood Insurance Rate Map (FIRM) that was completed for the county was in 1985.

Given that most individuals in the County do not live within a high risk flooding area, it is unsurprising that there is limited participation in the NFIP. As of February 2011 there were a total of 4 policies active in the County, insuring a total of $777,000[159]. Since 1978 there have been 2 claims in the County for a total of $12,821. Figure 6-1 identifies each community and the date each participant joined the NFIP.

Figure 6-1: Additional Information on Communities Participating in the NFIP[160]

Community	Participation	Initial FIRM	Current Eff. Map Date	Entry Date
Waseca County	Yes	08/19/85	08/19/85	08/19/85
City of Janesville	Yes	County Map	NSFHA	06/22/84
City of New Richland	Yes	County Map	NSFHA	03/22/11
City of Waldorf	No	N/A	N/A	N/A
City of Waseca	Yes	County Map	NSFHA	03/06/12

6.1.1 PLANS AND ORDINANCES

Waseca County and the four communities it contains have a variety of plans and ordinances currently in place that work towards mitigating hazards. Figure 6-2 lists some of the plans.

Figure 6-2: Existing Plans and Ordinances of Waseca County Communities

Community	Comp Plan	Zoning Ord	Building Code
City of Janesville	Yes	Yes	Yes
City of New Richland	No	Yes	Yes
City of Waldorf	Yes	Yes	2008
City of Waseca	Yes	Yes	2005

6.2 MITIGATION GOALS

Section 5.0 of this plan identified a numerous hazards that Waseca County is at risk from. In order to create plan that better reflects best practices of the time, the original goals and objectives from the 2008 Hazard Mitigation Plan have been completely revised and updated in order to mirror those found in the State of Minnesota All-Hazard Mitigation Plan. This will allow the two plans to work together and assist the State in developing strategies that will better reflect local conditions.

The goal and objectives are categorized by the six mitigation measure categories from the *FEMA State and Local Mitigation Planning How to Guides*. These are:

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

- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

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

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

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

Figure: 6-3: Natural Hazard Mitigation Goals, Strategies, and Objectives

Goal 1 – Flooding: Reduce deaths, injuries, property loss and economic disruption due to all types of flooding (riverine, flash flooding)	
Mitigation Strategy	**Objectives**
Prevention:	Planning, technical studies, training, adoption of ordinances and legislation, acquisition and use of equipment, establishing shelters, and encouraging participation in NFIP and CRS will be used to prevent or reduce risks to lives and property from flooding.
Property Protection:	Acquisition, repair, or retrofitting of property and acquisition and use of equipment will be used to prevent or reduce risks to property from flooding.
Public Education and Awareness:	Public education and access to information will be used to raise public awareness of risks from flooding in order to prevent or reduce those risks.
Natural Resource Protection:	Stream corridor protection projects and restoration and soil erosion control projects will be used to prevent or reduce risks and increase the protection of natural resources from flooding.
Emergency Services:	Technological improvements, warning systems, responder training, emergency response services, acquisition and use of equipment, and planning will provide emergency services to prevent or reduce the risks to lives and property from flooding.
Structural Improvements:	Construction and maintenance of drains, sewer drainage and separation projects, floodwalls, dams, culverts, levees, roads, bridges, and general flood protection projects will be used to prevent or reduce damages from flooding, loss of services to critical equipment, and the risks they pose to lives, property, and the natural environment.
Goal 2 – Tornado: Reduce deaths injuries, property loss, and economic disruption due to tornadoes.	
Mitigation Strategy	**Objectives**
Prevention:	Adoption of ordinances and legislation, acquisition and use of equipment, planning, conducting technical studies, and establishing of shelters will be used to prevent or reduce risks to lives, property, and economic activity from tornadoes.
Property Protection:	Constructing safe rooms and storm shelters, and retrofits will be used to prevent or reduce risks to property from tornadoes.
Public Education and Awareness:	Warning systems, public education, and access to information will be used to raise public awareness of risks from tornadoes in order to prevent or reduce those risks.
Emergency Services:	Warning systems, technological improvements, responder training, planning, emergency response services, and acquisition and use of equipment will provide

	emergency services to prevent or reduce risks from tornadoes.
Structural Improvements:	Construction of storm shelter and safe rooms and maintenance of other structural projects will be used to prevent or reduce risks from tornadoes.
Goal 3 – Windstorms: Reduce deaths, injuries, property loss, and economic disruption due to windstorms.	
Mitigation Strategy	**Objectives**
Prevention:	Planning, technical studies, acquisition and use of equipment, adoption of ordinances and legislation, and establishing of shelters will be used to prevent or reduce risks from windstorms to lives, property, and economic activity.
Property Protection:	Constructing safe rooms and storm shelters, retrofitting, and vegetation management will be used to prevent or reduce risks to the protection of property from windstorms.
Public Education and Awareness:	Public education, warning systems, and access to information will be used to raise public awareness of risks from windstorms in order to prevent or reduce those risks.
Emergency Services:	Warning systems, responder training, emergency response services, technological improvements, and response and recovery planning will provide emergency services to prevent or reduce risks from windstorms.
Structural Improvements:	Construction of storm shelters and safe rooms and maintenance of other structural projects will be used to prevent or reduce risks from windstorms.
Goal 4 – Severe Winter Weather: Reduce deaths, injuries, property loss, and economic disruption due to severe winter storms.	
Mitigation Strategy	**Objectives**
Prevention:	Acquisition and use of equipment, adoption and enforcement of ordinances and legislation, planning, and technical studies will be used to prevent or reduce risk to the protection of lives, property, and economic activity from the risks from severe winter storms.
Property Protection:	Acquisition and use of equipment and vegetation management will be used to prevent or reduce risks to property from the risks from severe winter storms.
Public Education and Awareness:	Public education, warning systems, access to information, and outreach projects will be used to raise public awareness of the risks from severe winter storms in order to reduce those risks.
Emergency Services:	Acquisition and use of equipment, emergency response services, warning systems, technological improvements, planning, and responder training will provide emergency services to prevent or reduce risks from severe winter storms.
Structural Improvements:	Structural projects will be implemented and maintained to prevent or reduce risks from severe winter storms.
Goal 5 – Drought: Reduce economic, agricultural, and natural resource disruption due to drought.	
Mitigation Strategy	**Objectives**
Prevention:	Planning, acquisition and use of equipment, and technical studies will be used to prevent or reduce risks from drought.
Property Protection:	Water treatment measures will be used to prevent or reduce risks to property from drought.
Public Education and Awareness:	Public education and access to information will be used to raise public awareness of risks from drought in order to prevent or reduce those risks.
Natural Resource Protection:	Planning and implementing watershed plans will be used to prevent or reduce risks from drought.
Structural Improvements:	Technological improvements and acquisition of equipment for structural projects will be used to prevent or reduce risks from drought.
Goal 6 – Earthquake: Limit property damage, economic loss, and disruptions in commercial and industrial activities due to earthquake.	
Mitigation Strategy	**Objectives**
Prevention:	Planning, building code adoptions and management programs will be used to prevent

	or reduce risks to property and economic activity from earthquakes.
Property Protection:	Repair and retrofitting of structures will be used to prevent or reduce risks from earthquakes.
Public Education and Awareness:	Public education and access to information will be used to raise awareness of the risks from earthquakes in order to prevent or reduce those risks.
Emergency Services:	Planning, responder training, alert systems, establishing shelters, and technological improvements will provide emergency services to prevent or reduce risks from earthquakes.

The following hazards were not found in the State All-Hazard Mitigation Plan and were developed by the Waseca County planning team.

Figure 6-4: Hazard Mitigation Goals, Strategies, and Objectives for Other Hazards

Goal 7 – Infrastructure Failure: Decrease the risks to life and property from infrastructure failure.	
Mitigation Strategy	**Objectives**
Prevention:	Planning, technical studies, inspections, and encouraging participation in NFIP will be used to prevent or reduce risks from infrastructure failures.
Public Education and Awareness:	Public education will be used to raise awareness of risks from infrastructure failures in order to prevent or reduce those risks.
Natural Resource Protection:	Watershed management projects will be used to protect natural resources and prevent or reduce risks from infrastructure failures.
Emergency Services:	Planning, responder training, warning systems, emergency response services, technological improvements, and acquisition and use of equipment will provide emergency services to prevent or reduce risks from infrastructure failures.
Goal 8 – Hazardous Material Release: Limit property damage, loss of life, economic loss, and disruptions in commercial and industrial activities due to a hazardous material release.	
Mitigation Strategy	**Objectives**
Prevention:	Proper regulations and licensing will be utilized to reduce the risk from hazardous materials.
Property Protection:	Outfit structures with warning measures and protective features to mitigate the damages from the release of hazardous materials.
Public Education and Awareness:	Increase public awareness of what to do in the event of a hazardous material release and the hazardous material risk present in the community.
Emergency Services:	Increase capability of community fire departments and first responder's capability to respond to release incidents.
Goal 9 –Fires: Reduce deaths, injuries, property loss and economic disruption due to structural and wildfires.	
Mitigation Strategy	**Objectives**
Prevention:	Planning, technical studies, training, adoption of ordinances and legislation and acquisition and use of equipment will be used to prevent or reduce risks to lives and property from fires.
Property Protection:	Adopt state fire codes and inspect structure per local ordinance.
Public Education and Awareness:	Public education and access to information will be used to raise public awareness of risks from fires in order to prevent or reduce those risks.
Emergency Services:	Technological improvements, warning systems, responder training, emergency response services, acquisition and use of equipment, and planning will provide emergency services to prevent or reduce the risks to lives and property from fires.
Goal 10 – Severe Summer Weather: Reduce deaths, injuries, property loss, and economic disruption due to severe summer storms.	
Mitigation Strategy	**Objectives**

Prevention:	Acquisition and use of equipment, adoption and enforcement of ordinances and legislation, planning, and technical studies will be used to prevent or reduce risk to the protection of lives, property, and economic activity from the risks from severe summer storms.
Property Protection:	Acquisition and use of equipment and vegetation management will be used to prevent or reduce risks to property from the risks from severe summer storms.
Public Education and Awareness:	Public education, warning systems, access to information, and outreach projects will be used to raise public awareness of the risks from severe summer storms in order to reduce those risks.
Emergency Services:	Acquisition and use of equipment, emergency response services, warning systems, technological improvements, planning, and responder training will provide emergency services to prevent or reduce risks from severe summer storms.
Structural Improvements:	Structural projects will be implemented and maintained to prevent or reduce risks from severe summer storms.
Goal 11 – Infectious Disease: Limit loss of life, economic loss, and disruptions in commercial and industrial activities due to an infectious disease outbreak.	
Mitigation Strategy	**Objectives**
Prevention:	Proper regulations and licensing will be utilized to reduce the risk from infectious disease.
Public Education and Awareness:	Increase public awareness of what to do in the event of an infectious disease outbreak.
Emergency Services:	Increase capability of community response personnel to effectively respond to an infectious disease outbreak.
Goal 12 – Water Supply Contamination: Limit loss of life, economic loss, and disruptions in commercial and industrial activities due to water supply contamination.	
Mitigation Strategy	**Objectives**
Prevention:	Proper regulations and licensing will be utilized to reduce the risk from infectious disease.
Property Protection:	Outfit wells and reservoirs with warning measures and protective features to mitigate the damages from water supply contamination.
Public Education and Awareness:	Increase public awareness of what to do in the event of water supply contamination.
Emergency Services:	Increase capability of community response personnel to effectively respond to water supply contamination.

6.3 HAZARD MITIGATION ACTIONS

Individual communities in Waseca County, as well as key stakeholders at the County level, were approached to evaluate the current actions listed in the existing plan as well as to suggest and develop new actions for the 2013 update.

Stakeholders were asked to evaluate the potential mitigation actions on a number of scales. A comprehensive benefit cost analysis was not completed for the individual actions, but participants in the community meetings were asked to rank the actions in terms of funding availability and cost to complete. These rankings were combined with the rankings for the severity and probability of the hazards addressed and resulted in a priority score.

Actions were categorized into three main areas:
New – Actions new to this update.

In Progress – Actions that are currently being worked on.
Ongoing – Actions that require ongoing maintenance and involvement.

The legend below shows which mitigation strategy is utilized by each action.

Figure 6-5: Mitigation Strategy Legend

Prevention = P
Property Protection = PP
Public Education = PE
Natural Resources Protection = NR
Emergency Services = ES
Structural Improvement = SI

6.3.1 Waseca County Mitigation Actions

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Work with DNR to improve infrastructure of Lake Elysian dam.	Low/New	Infrastructure Failure	SI
Seek out funding to seal existing wells.	Low/New	Water Supply Contamination	SI
Evaluate funding sources for a countywide camera system for public buildings and infrastructure.	Low/New	Water Supply Contamination	PP
Evaluate funding sources for new equipment needed to respond to flood events including portable lights, generators, sandbag machines, water pumps, and portable water dams.	Low/Ongoing	Flood	ES
Purchase a Geiger counter for County use in the event of a radiological disaster event.	Low/New	Hazardous Material Release	ES
Seek out funding for the creation of a brochure for the public detailing how to survive for 72 hours on your own in the event of a large scale disaster.	Low/New	All-Hazards	PE
Evaluate options for a Somoli language hotline.	Low/New	All-Hazards	PE
Evaluate possibility of running community drills that cover disaster events such as a tornado or hazardous material spill.	Low/New	Tornadoes, Hazardous Material Release	PE
Ensure County floodplain maps accurately reflect the most up to date data available.	Medium/In Progress	Flood	P
Work with individual Waseca County communities to develop a wellhead protection plan.	Medium/New	Water Supply Contamination	P
Seek out funding to bury power lines to critical County facilities.	Medium/In Progress	Tornado, Severe Winter Weather	SI
Review and evaluate current staff training to ensure they are capable of carrying out the Emergency Operations Plan.	Medium/Ongoing	All-Hazards	ES

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Ensure County staff are prepared for a disease outbreak concerning livestock.	Medium/Ongoing	Infectious Disease	ES
Review current zoning ordinances to ensure they are designed to reduce the risk of disease spreading from livestock.	Medium/Ongoing	Infectious Disease	P
Ensure placement of severe weather radios in schools and county buildings.	Medium/In Progress	Tornado, Severe Summer Weather	ES
Collaborate with Red Cross to enhance translation options available to County Emergency Services Employees.	Medium/New	All-Hazards	PE
Distribute educational material to the public via websites, handouts, and public presentations.	Medium/Ongoing	All-Hazards	PE
Create a staff transition plan to ensure that knowledge and expertise of existing staff is carried on to successors.	Medium/New	All-Hazards	ES
Provide health education to private businesses where the risks of infectious diseases are a concern.	High/Ongoing	Infectious Disease	PE
Continue collaborating with the Mayo Health System to encourage participation in vaccination programs for all Waseca County residents, particularly children.	High/Ongoing	Infectious Disease	PE
Continue providing Code Red early warning system to County Residents.	High/Ongoing	Tornado, Severe Summer Weather	ES
Evaluate the possibility of adopting the State Building Code for new housing and commercial construction.	High/In Progress	Fire	P
Ensure that County residents have easy access to a storm shelter.	High/In Progress	Tornado	SI
Continue Emergency Community Health Outreach program, which works to bring hazard information to non-English speaking County residents.	High/Ongoing	All-Hazards	PE
Continue reviewing the Emergency Operations Plan to ensure it adequately details the needed steps to respond to all potential hazards.	High/Ongoing	All-Hazards	ES
Continue participating in Severe Weather Awareness Week and Severe Winter Weather Week.	High/Ongoing	Severe Summer Weather, Tornado, Severe Winter Weather	PE
Construction of Storm Shelters and Safe Rooms for unprotected populations (campgrounds, mobile home parks, schools).	High/New	Tornado, Severe Weather, Damaging Winds	ES

6.3.2 City of Janesville Mitigation Actions

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Upgrade water main infrastructure to 6 or 8 inch pipes.	Low/New	Flood	SI
Construct 4th siren to cover expanded growth in north east area of town	Low/New	Tornado, Severe Summer Weather	ES
Purchase specialized equipment to fight wildfires including wildfire suits, gear, and a tender truck.	Low/New	Fire	ES
Purchase a backup power generator for the emergency operations center.	Low/New	All-Hazards	PP
Purchase a power generator for the city's main lift station at West and 1st streets.	Low/New	Flood	SI
Upgrade municipal electricity system to create a redundancy in the event of an outage.	Low/New	Tornado, Severe Summer Weather, Severe Winter Weather	SI
Study possibility of constructing a separate sanitary sewer to avoid flooding.	Low/New	Flood	SI
Upgrade power generator in nursing home	Low/New	Flood, Severe Winter Weather, Severe Summer Weather	PP
Train all fire department personnel and other first responders in all Waseca county cities in proper hazardous material procedures.	Medium/Ongoing	Hazardous Material Release	ES
Utilization of water conservation strategies in city ordinances.	Medium/Ongoing	Drought	P
Continue drug prevention efforts. Educational material in print and presentation formats will be distributed to youth, communities at risk, and vulnerable people.	Medium/Ongoing	Hazardous Material Release	PE
Undertake community education and drills to prepare residents for severe weather storm events.	Medium/Ongoing	Severe Summer Weather, Severe Winter Weather, Tornado	PE
Utilization of severe storm spotters network in all Waseca County cities.	Medium/Ongoing	Severe Summer Weather, Severe Winter Weather, Tornado	ES
Create and maintain Mutual Aid Agreements for all Waseca County communities.	Medium/Ongoing	Fire	P

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Distribute educational material to the public via websites, handouts, and public presentations.	Medium/Ongoing	All-Hazards	PE
Review and evaluate current staff training to ensure that they are capable of carrying out the Emergency Operations Plan.	Medium/Ongoing	All-Hazards	ES
Maintain Emergency Operations Plan	Medium/Ongoing	All-Hazards	ES
Maintain city building and fire codes.	High/Ongoing	Fire	P
Continue offering classes for residents regarding topics which often lead to fires.	High/Ongoing	Fire	PE
Utilization of local zoning ordinances to regulate building density, use, bulk, height, and setbacks to assist in preventing fires from jumping from one structure to another.	High/Ongoing	Fire	P
Utilize city ordinances to discourage placement of trees near power lines.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	P

6.3.3 City of New Richland Mitigation Actions

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Develop standardized curriculum for staff training.	Low/New	All-Hazards	ES
Utilization of water conservation strategies in city ordinances.	Low/Ongoing	Drought	P
Purchase portable generators for city.	Low/New	Flood, Tornado, Severe Winter Weather	ES
Investigate ways to reduce infiltration and inflow to sewer system.	Low/In Progress	Flood	SI
Provision of proper equipment to adequately fight wildfires for all Waseca County fire departments.	Medium/New	Fire	ES
Work with county to ensure ditch system is appropriate for water load.	Medium/In Progress	Flood	P
Continue drug prevention efforts. Educational material in print and presentation formats will be distributed to youth, communities at risk, and vulnerable people.	Medium/Ongoing	Hazardous Material Release	PE
Train all fire department personnel and other first responders in all Waseca county cities in proper hazardous material procedures.	Medium/Ongoing	Hazardous Material Release	ES

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Create and maintain Mutual Aid Agreements for all Waseca County communities.	Medium/Ongoing	Fire	P
Distribute educational material to the public via websites, handouts, and public presentations.	Medium/Ongoing	All-Hazards	PE
Review and evaluate current staff training to ensure that they are capable of carrying out the Emergency Operations Plan.	Medium/Ongoing	All-Hazards	ES
Maintain Emergency Operations Plan	Medium/Ongoing	All-Hazards	ES
Undertake community education and drills to prepare residents for severe weather storm events.	High/Ongoing	Severe Summer Weather, Severe Winter Weather, Tornado	PE
Utilization of severe storm spotters network in all Waseca County cities.	High/Ongoing	Severe Summer Weather, Severe Winter Weather, Tornado	PE
Maintain city building and fire codes.	High/Ongoing	Fire	P
Continue offering classes for residents regarding topics which often lead to fires.	High/Ongoing	Fire	PE
Utilization of local zoning ordinances to regulate building density, use, bulk, height, and setbacks to assist in preventing fires from jumping from one structure to another.	High/Ongoing	Fire	P
Utilize city ordinances to discourage placement of trees near power lines.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	P

6.3.4 City of Waldorf Mitigation Actions

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Remove sediment buildup from storm sewer system.	Low/New	Flood	SI
Expand water lines to 8 inch mains.	Low/New	Flood	SI
Purchase backup generators for city.	Medium/New	Flood, Tornado, Severe Winter Weather	PP
Construct storm shelters in community center and library.	Medium/New	Tornado	PP
Utilization of water conservation strategies in city ordinances.	Medium/Ongoing	Drought	P
Wire community center and library for backup generators.	Medium/New	Flood, Tornado, Severe Winter Weather	PP
Purchase backup generator for school.	Medium/New	Flood, Tornado, Severe Winter Weather	PP
Provision of proper equipment to adequately fight wildfires for all Waseca County fire departments.	High/Ongoing	Fire	ES
Purchase security fencing for Crystal Valley.	High/New	Hazardous Material Release	PP
Retrofit emergency sirens with talkback.	High/New	Tornado	ES
Construct a safe room in the Country Garden Apartments Section 8 housing complex.	High/New	Tornado	PP
Undertake community education and drills to prepare residents for severe weather storm events.	High/Ongoing	Tornado, Severe Summer Weather	PE
Utilization of severe storm spotters network in all Waseca County cities.	High/Ongoing	Tornado, Severe Summer Weather	ES
Train all fire department personnel and other first responders in all Waseca county cities in proper hazardous material procedures.	High/Ongoing	Fire	ES
Create and maintain Mutual Aid Agreements for all Waseca County communities.	High/Ongoing	Fire	P
Distribute educational material to the public via websites, handouts, and public presentations.	High/Ongoing	All-Hazards	PE
Review and evaluate current staff training to ensure that they are capable of carrying out the Emergency Operations Plan.	High/Ongoing	All-Hazards	ES
Maintain Emergency Operations Plan	High/Ongoing	All-Hazards	ES
Maintain city building and fire codes.	High/Ongoing	Fire	P
Continue offering classes for residents regarding topics which often lead to fires.	High/Ongoing	Fire	PE

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Utilization of local zoning ordinances to regulate building density, use, bulk, height, and setbacks to assist in preventing fires from jumping from one structure to another.	High/Ongoing	Fire	P
Utilize city ordinances to discourage placement of trees near power lines.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	P
Continue drug prevention efforts. Educational material in print and presentation formats will be distributed to youth, communities at risk, and vulnerable people.	High/Ongoing	Hazardous Material Release	PE

6.3.5 City of Waseca Mitigation Actions

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Enforce city ordinance to have all buildings in the city clearly numbered.	Low/In Progress	All-Hazards	ES
Scan building plans to create a digital reference.	Low/New	All-Hazards	ES
Bury electric lines in key areas.	Low/New	Tornado, Severe Summer Weather, Severe Winter Weather	SI
Purchase a portable generator for the city.	Low/New	Tornado, Severe Summer Weather, Severe Winter Weather, Flood	ES
Build new public works facility.	Low/New	All-Hazards	SI
Outfit lift stations with separate generators.	Medium/New	Tornado, Severe Summer Weather, Severe Winter Weather, Flood	PP
Utilization of water conservation strategies in city ordinances.	Medium/Ongoing	Drought	P
Purchase a Geiger counter for the fire departments in the event of a radiological hazard event.	Medium/New	Hazardous Material Release	ES
Develop zoning plan for the airport that takes potential hazard situations into account.	Medium/In Progress	Hazardous Material Release	P
Undertake community education and drills to prepare residents for severe weather storm events.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	PE
Utilization of severe storm spotters network in all Waseca County cities.	High/Ongoing	Tornado, Severe Summer Weather	ES
Train all fire department personnel and other first responders in all Waseca county cities in proper hazardous material procedures.	High/Ongoing	Hazardous Material Release	ES
Provision of proper equipment to adequately fight wildfires for all Waseca County fire departments.	High/Ongoing	Fire	ES
Continue drug prevention efforts. Educational material in print and presentation formats will be distributed to youth, communities at risk, and vulnerable people.	High/Ongoing	Hazardous Material Release	PE
Utilize city ordinances to discourage placement of trees near power lines.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	P

Mitigation Action	Priority/ Status	Hazard Addressed	Mitigation Strategy
Continue promoting Code RED early warning system to the public.	High/Ongoing	Tornado, Severe Summer Weather, Severe Winter Weather	PE
Create and maintain Mutual Aid Agreements for all Waseca County communities.	High/Ongoing	Fire	P
Distribute educational material to the public via websites, handouts, and public presentations.	High/Ongoing	All-Hazards	PE
Review and evaluate current staff training to ensure that they are capable of carrying out the Emergency Operations Plan.	High/Ongoing	All-Hazards	ES
Host monthly coordination meetings between police, fire department, and hospital personnel.	High/Ongoing	All-Hazards	ES
Maintain city building and fire codes.	High/Ongoing	Fire	P
Continue offering classes for residents regarding topics which often lead to fires.	High/Ongoing	Fire	PE
Utilization of local zoning ordinances to regulate building density, use, bulk, height, and setbacks to assist in preventing fires from jumping from one structure to another.	High/Ongoing	Fire	P

7.0 PLAN MAINTENANCE

7.1 MONITORING, EVALUATING, & UPDATING THE PLAN

Over the course of the next five-year cycle the Waseca County Emergency Management Department will work with the Region Nine Development Commission to continually monitor and review the current plan content and make revisions and amendments as needed. The Emergency Management director will be responsible for maintaining email contact with the Stakeholder Taskforce and responding to questions that may arise about plan specifics.

The County Emergency Management Department will hold an annual review meeting of the Stakeholder Taskforce. In addition to task force notification, this meeting will be posted at city halls, county courthouse, and websites to notify the public of the meeting. Region Nine staff representatives will be available to facilitate the meeting and guide the discussion.

At this meeting, members will discuss in more detail the development of mitigating hazards, action steps have been taken over the 12 month period, and specific ways the current plan is succeeding or falling short. Initial ideas will be included in a progress report prepared by Region 9 to review and revise criteria of mitigating hazards, which would be forwarded back to all jurisdictions within the county.

Each entity's regulating authorities will consider adoption of plan revisions made at the review meeting. Cities will have reviews and conduct revisions with their Planning Commissions and City Council. The Waseca County Emergency Management Director and Administrator (or equivalent staff position) would forward Plan revisions to appropriate departments (i.e., Public Works, Sheriffs, Faculties and Health). Ultimately, the County Board will consider final revisions to the Plan.

Applicable plans such as zoning ordinances, lakeshore ordinances, building codes, staff development plans, and waste water treatment policies will be amended to incorporated related changes. These amendments will be handled by local government entities (city council, planning commissions) at the city level. Waseca County officials, as well as city-level officials within the county, will be responsible for the integration of this All-Hazard Mitigation Plan into other applicable plans or planning mechanisms that they may already maintain or may be currently undertaking

Additionally, the Stakeholder Taskforce will be reconvened for a special meeting in the event of a major disaster or significant development in a particular hazard in the County. This meeting will determine if the plan needs to be updated immediately in order to take advantage of grant opportunities that may arise due to the new circumstances. If so, an amendment to the plan will be drafted at the meeting and distributed to the appropriate parties for adoption immediately.

7.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

The recommended actions and mitigation strategies detailed in this plan will be incorporated into the individual planning documents of the appropriate departments and communities at the County and city level. In the course of regularly scheduled updates to zoning plans and ordinances the County and cities will consult with the Hazard Mitigation Plan and see if their existing practices are in line with what has been determined to be the best way to reduce the risk and damage from hazards.

7.3 CONTINUED PUBLIC INVOLVEMENT

Ensuring that the public is actively involved has been a major priority of the planning process and this focus will continue after the plan is finalized and put into use. The full plan will be available in digital form both on the County Emergency Management website and the Region Nine Development Commission website. Education events held for specific hazards throughout the County will make mention of the plan and inform the public of its purpose. Public notice will be given for all annual review meetings and Stakeholder Taskforce members will be encouraged to bring interested parties with them to these meetings.

8.0 GLOSSARY OF ACRONYMS

BCA	Benefit Cost Analysis
BFE	Base Flood Elevation
CFR	Code of Federal Regulation
CPRI	Calculated Priority Risk Index
DEED	Department of Employment and Economic Development
DHS	Department of Homeland Security
DMA	Disaster Mitigation Act of 2000
DNR	Department of Natural Resources
EAP	Emergency Action Plan
EMV	Estimated Market Value
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FY	Fiscal Year
GIS	Geographic Information Systems
HAZMAT	Hazardous Material
HAZUS	Hazard-United States (software program)
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HSEM	Homeland Security and Emergency Management
LIDAR	Laser Detecting and Ranging
MHIRA	Multi-Hazard Identification and Risk Assessment
MMI	Modified Mercalli Intensity Scale
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NCDC	National Climatic Data Center
NFIA	National Flood Insurance Act of 1968
NFIF	National Flood Insurance Fund
NFIP	National Flood Insurance Program
NRCS	National Resource Conservation Service
PDM	Pre-Disaster Mitigation
RFC	Repetitive Flood Claims
RFP	Request For Proposal
SRL	Severe Repetitive Loss
USC	United States Code
VIC	Voluntary Investigation and Cleanup

9.0 APPENDICES

9.1 ADOPTING RESOLUTIONS

Space reserved for adopting resolutions.

9.2 MEETING MINUTES

Waseca County Mitigation Plan Meeting
August 24, 2011
9:00 to 11:00 AM
Waseca County Law Enforcement Center

Attending: Dennis Dineen - Waseca County
Frank Balak – Consultant
Jon Hammel – Region Nine Development Commission
Jim McClosky – HSEM Mitigation Planner
Jan Birkeland – HSEM Mitigation Grants Specialist (via telephone)

The objective of the meeting is to build communication bridges between county emergency directors and HSEM's mitigation program. Waseca County has approved funding through DR-1830. This is a summary of the main points of the discussion.

Quarterly Reports
FEMA audit findings in other states are causing more emphasis adhering to the grant contract and on quarterly reports. The objective for expenditure requests and back up documentation is to meet federal regulation. The method of reporting is intended to make records available at HSEM so federal auditors do not have to go to the county.

The expenditure report was reviewed so that each item was understood. Budget categories cannot exceed 10% unless amended and approved by FEMA. The backup documents for reimbursements are receipts of payment, copies of checks, and proofs of warrants. Signed timesheets may also be used if federal funds are being requested for payment.

Action: Jan will send Dennis an up to date expenditure report.

Action: Dennis will send a cover page summarizing both requests for reimbursement and local match for county employees participating in plan development.

Local Match
The local match of the grant is to be reported quarterly. Cash Match is divided into cash and in-kind. Cash is actual funds spent or county/city non-federally funded base pay spent for the project. In-kind match is considered donations that must evaluated for payment. Sample forms for recording both types of match were given. The samples may be re-formatted for use.

Quarterly Report
The quarterly report is the narrative of progress for the quarter. The spaces in the report summarize the overall status of the report. Comments should explain any delays encountered.

Hazard Mitigation Assistance (HMA) Program Overview

The funding and eligible projects were presented. The HMA program was characterized to be completely voluntary.

Responsibilities

HSEM Mitigation staff:

- Provide program and technical assistance
- Review mitigation plans before sending to FEMA
- Monitor progress of the project and take effective actions to administer the grant contract

Waseca County:

- Responsible for executing the grant contract including quarterly reporting
- Lead the mitigation plan review to meet FEMA planning requirements
- Administer contracts with consultants

Consultants

- Participate in the planning process as contracted by the county

Communication with HSEM

- In general, HSEM will be in communication with the county about expenditure reporting and progress of the plan. Example: the expenditure report is required to be signed by the county as the grantee but the documents may be formatted by the consultant.
- The county, consultants, and HSEM should communicate about items regarding plan development or content.

Mitigation Plan

The mitigation plan guide was presented. Requests were made to assist with information to be transferred to the state mitigation plan.

The requests for Waseca County's plan include:

- Standardize the risk identification per the state plan.
- Use the Calculated Risk Priority Index (CPRI) – Jim will send the spreadsheet version
- Insert and use the mitigation goals, strategies, and objectives and matrix them to the mitigation actions.
- Use the standard format for mitigation actions as seen in the planning guide.

The county does not have to address the optional requirements for vulnerability.

It is also suggested that the risk assessment be sent to HSEM for review before rate hazards using CPRI. The reason is that a complete risk assessment is needed for the ranking. This review should also help in the mitigation actions review since more meetings will not have to be called if the risk assessment did not meet requirements.

Use of GIS was discussed. Maps that detail risk to a specific location were encouraged. Not all hazards impact countywide. Maps are a good way to show where the flood, wildfire, and landslide risks in the county.

Expanding public involvement was discussed. It was suggested to invite 'champions' from the community to participate on the mitigation team or other capacity. Posting the plan on the website may be expand participation. Developing partnerships with other agencies may be helpful to expand public involvement and to bring other community expertise into the plan.

HSEM mitigation uses the term critical facilities instead of critical infrastructure. The distinction is that sensitive facilities do not have to be listed in the mitigation plan.

The plan review due date is 2/28/2013. The plan should be sent to HSEM by 11/15/2012 to ensure enough time for HSEM/FEMA review and any revisions. The downside of not making the review date is that applications for mitigation projects will not be approved until FEMA approves the plan. PA and IA are not affected.

Meeting with City of Waldorf
September 29, 2011
1:00 to 1:30 PM
Waldorf City Hall

Attending: Dennis Dinneen – Waseca County Emergency Management Director
Jon Hammel – Region Nine Development Commission
Bob Vogelsang – Mayor
Adam Groskruetz – Fire Chief, Emergency Management Director
Judy Kohout – City Clerk

Dennis opened the meeting with some introductory remarks regarding the update.

Jon followed with a brief explanation of what hazard mitigation is and the benefits of being part of a community that has an approved and adopted mitigation plan.

Jon presented an overview of the update planning process and schedule.

Jon then explained the City's role in the planning process. Adam was designated as the primary contact for the City.

Jon then went through the survey with the representatives of the City and provided examples of the information the City is being asked for.

Lastly, Dennis and Jon answered questions.

Meeting with City of New Richland

October 4, 2011

6:00 to 6:30 PM

New Richland Village Hall

Attending: Dennis Dinneen – Waseca County
Jon Hammel – Region Nine Development Commission
Mike Pentico – Waseca County
Frank Balak – FJB Consulting Services
Wayne Billing – City Clerk/Treasurer
Scott Eads – Chief of Police
Jennie Johnson – Ambulance Chief
Jeremy Parpart – Fire Chief
Brian Svoboda – Fire Captain

Dennis opened the meeting with some introductory remarks regarding the update.

Jon followed with a brief explanation of what hazard mitigation is and the benefits of being part of a community that has an approved and adopted mitigation plan.

Jon presented an overview of the update planning process and schedule.

Jon then explained the City's role in the planning process. Wayne was designated as the primary contact for the City.

Jon then went through the survey with the representatives of the City and provided examples of the information the City is being asked for.

Lastly, Dennis and Jon answered questions.

Meeting with City of Waseca
October 5, 2011
10:00 to 10:30 AM
Waseca City Hall

Attending: Dennis Dinneen – Waseca County
Jon Hammel – Region Nine Development Commission
Penny Vought – Police Chief
Gary Conrath – Fire Chief
Kimberly Johnson – Planning Director

Dennis opened the meeting with some introductory remarks regarding the update.

Jon followed with a brief explanation of what hazard mitigation is and the benefits of being part of a community that has an approved and adopted mitigation plan.

Jon presented an overview of the update planning process and schedule.

Jon then explained the City's role in the planning process. Penny was designated as the primary contact for the City.

Jon then went through the survey with the representatives of the City and provided examples of the information the City is being asked for.

Lastly, Dennis and Jon answered questions.

1st Steering Committee Meeting

October 12, 2011
2:00 to 3:00 PM
County Annex

Attending: Dennis Dinneen – Waseca County Emergency Management Director
Laura Elvebak – Waseca County Administrator
Brad Milbrath – Waseca County Sheriff
Trevor Kanewischer – Waseca County Chief Deputy Sheriff
Nathan Richman – Waseca County Engineer
Jon Hammel – Region Nine Development Commission

Absent: Cheri Lewer – Waseca County Public Health Director

Dennis opened the meeting with some introductory remarks regarding the update.

Jon followed with a brief explanation of what hazard mitigation is and the benefits of the county having an approved and adopted mitigation plan.

Jon presented an overview of the update planning process and schedule.

Jon then explained the steering committee's and county's roles in the planning process.

Jon reviewed the progress to date and explained the survey and the cities' roles in the planning process.

Lastly, Dennis and Jon answered questions.

2nd Steering Committee Meeting
February 13, 2012
9:30 to 11:30 AM
County East Annex

Attending: Dennis Dinneen – Waseca County Emergency Management Director
Laura Elvebak – Waseca County Administrator
Brad Milbrath – Waseca County Sheriff
Trevor Kanewischer – Waseca County Chief Deputy Sheriff
Nathan Richman – Waseca County Engineer
Cheri Lewer – Public Health Director
Jon Hammel – Region Nine Development Commission

Absent: None.

Dennis opened the meeting with a welcome and some introductory remarks regarding the update.

The group reviewed the minutes from the last Steering Committee meeting in October 2011.

Jon provided a brief explanation the progress that had been made since the last Steering Committee meeting. Dennis and Jon had met with all the cities in the county to explain reason behind hazard mitigation planning, the update process, and handed out copies of the local jurisdiction surveys. The last of the surveys had been collected in January 2012. Also, during this time period, staff had developed the skeleton of the plan and had begun to fill in the various sections – starting with the community profile and hazard descriptions.

The group reviewed the survey data submitted by the cities. The data was reorganized and presented to the Steering Committee in the meeting packet. Jon presented the Calculated Priority Risk Index and explained how the spreadsheet worked.

The group reviewed the county-level survey. The group completed Part 2 (Existing Policy Documents) and Part 3 (Risk Assessment) of the survey during the meeting. The group was asked to complete Part 1 (Preliminary Questions) as homework and to submit their response to Jon by March 1st. Jon will send out information regarding the definition of "critical facilities" to the group for their review and use. Jon will follow up with Mark Leiferman (County Planning/Zoning Administrator) regarding the existence of various county plans.

The group reviewed the list of non-county/municipal government stakeholders and suggested several additional stakeholders to be added to the list. The group then reviewed the local organization survey that is to be distributed to the stakeholders.

The group then reviewed the draft community profile section of the plan. The section is nearly complete. Jon noted that staff had encountered some difficulties getting the GIS data linked to

the assessor spreadsheet. As a result, the land use portion of the section was incomplete. Jon added that staff had just recently resolved the problem and expects to finish the section by the end of the month.

Jon provided an update regarding the project timeline. Despite a slight setback regarding the collection of the city survey data, the project remained on schedule. Jon and Denny informed the Steering Committee that from this point forward they intend to meet on a more frequent basis.

Lastly, Denny and Jon answered questions and thanked the committee for their dedication to this effort.

3rd Steering Committee Meeting
June 26, 2012
9:00 to 11:00 AM
North View Meeting Room
229 Johnson Ave. SW Waseca

Attending: Dennis Dinneen – Waseca County Emergency Management Director
Laura Elvebak – Waseca County Administrator
Brad Milbrath – Waseca County Sheriff
Trevor Kanewischer – Waseca County Chief Deputy Sheriff
Nathan Richman – Waseca County Engineer
Cheri Lewer – Waseca County Public Health Director
Jon Hammel – Region Nine Development Commission

Absent: None.

Guests: Mark Leiferman – Waseca County Planning & Zoning Director
Lenny Hurlburt – Waseca County Planning & Zoning Technician
Judy Hiller – Information Technology Director
Daniel Bonnell – Region Nine Community Development Intern

Dennis opened the meeting with a welcome and some introductory remarks regarding the update.

The group reviewed the minutes from the last Steering Committee meeting in October 2011.

Jon provided a brief explanation the progress that had been made since the last Steering Committee meeting. Staff had compiled the individual city and county feedback from the surveys, established the preliminary Calculated Priority Risk Index rankings for the hazards, complied a listing of critical facilities, finished the draft Community Profile section, and nearly completed the Risk Assessment section.

The group planned the stakeholder meeting. It was decided to hold the meeting on Thursday July 19th, from 10-12 noon, in the East Annex. Laura will work with Denny and Jon to get a press release sent out to the media. Judy will work with Denny and Jon to advertise the meeting on the county website.

The group reviewed the Stakeholder List. Denny and Jon will prepare and send out personal invitations to those stakeholders identified by the group on the Stakeholder List – including representatives from local jurisdictions, medical facilities, schools, utilities, etc.

The group reviewed the draft Community Profile section. The group identified several minor corrections and requested the inclusion of additional material related to the impact of the prison on population trends.

Jon provided an overview of the risk assessment section and requested input from the group on where to acquire historical data on the number and characteristics of past occurrences of: hazardous material release, infectious disease, infrastructure failure, and water supply contamination. The group offered several ideas regarding how to finish these subsections. Jon will coordinate with individual group members on the completion of these topics.

The group reviewed the preliminary list of critical facilities.

Jon provided an update regarding the project timeline.

Lastly, Denny and Jon answered questions and thanked the committee for their dedication to this effort.

Countywide Stakeholder Meeting

July 18, 2012

10:00 AM to 12:00 Noon

East Annex, Waseca MN

Attending:

Dennis Dinneen – Waseca County Emergency Management Director
Laura Elvebak – Waseca County Administrator
Mike Hintz – County Commissioner 2nd District
Lenny Hurlburt – Waseca County Planning & Zoning Technician
Mark Leiferman – Waseca County Planning & Zoning Director
Cheri Lewer – Waseca County Public Health Director
Brad Milbrath – Waseca County Sheriff
Vicki Neidt – Mayo Clinic Health Systems, Waseca
Angela Storch – American Red Cross Executive Director Rice, Le Sueur, and Waseca Chapter
Daniel Bonnell – Region Nine Development Commission
John Considine – Region Nine Development Commission
Jon Hammel – Region Nine Development Commission
Isaac Kerry – Region Nine Development Commission

Jon opened the meeting with a welcome and a round of introductions.

Jon reviewed hazard mitigation as a concept, the benefit of participating in a multi-jurisdictional planning process, progress to date in the update, and the next steps. He then reviewed the county hazard rankings and the goals/strategies identified for the plan.

Isaac led a discussion of the mitigation actions identified in the existing 2008 plan. The group discussed each action individually.

Isaac then led a discussion of potential new mitigation actions for inclusion into the 2013 update. The group then discussed possible additions.

Lastly, Denny and Jon thanked the group for coming and for their dedication to the update process.

Waldorf Stakeholder Meeting

July 30, 2012
1:00PM to 1:30PM
City Hall, Waldorf MN

Attending:

Adam Groskruetz – Fire Chief, Emergency Management Director
Judy Kohout – City Clerk
Jon Hammel – Region Nine Development Commission
Daniel Bonnell – Region Nine Development Commission

Jon opened the meeting with a welcome and brief summary of the hazard mitigation planning process.

The group then reviewed the city hazard rankings and the goals/strategies identified for the plan.

Jon led a discussion of the mitigation actions identified in the existing 2008 plan. The group discussed each action individually.

Jon then led a discussion of potential new mitigation actions for inclusion into the 2013 update.

Lastly, Jon and Daniel thanked the group for coming and for their dedication to the update process.

City of Waseca Stakeholder Meeting

August 15, 2012
2:00PM to 4PM
City Hall, Waseca MN

Attending:

Clark Fell – Public Works Director
Gary Conrath – Fire Chief
J. Crystal Prentice – City Manager
Kim Johnson – Planning Director
Nathan Reinhardt – Finance Director
Penny Vought – Police Chief
Russ Stammer – City Engineer
Jon Hammel – Region Nine Development Commission
Isaac Kerry – Region Nine Development Commission

Jon opened the meeting with a welcome and a round of introductions.

Jon reviewed hazard mitigation as a concept, the benefit of participating in a multi-jurisdictional planning process, progress to date in the update, and the next steps. He then reviewed the city hazard rankings and the goals/strategies identified for the plan.

Isaac then led a discussion of the mitigation actions identified in the existing 2008 plan. The group discussed each action individually.

Isaac then led a discussion of potential new mitigation actions for inclusion into the 2013 update. The group then discussed possible additions.

Lastly, Jon and Isaac thanked the group for coming and for their dedication to the update process.

New Richland Stakeholder Meeting

August 15, 2012
6:30PM to 8:30PM
City Hall, New Richland MN

Attending:

Wayne Billing – City Clerk
Jon Hammel – Region Nine Development Commission
Isaac Kerry – Region Nine Development Commission

Jon opened the meeting.

Jon reviewed the city hazard rankings and the goals/strategies identified for the plan.

Isaac then led a discussion of the mitigation actions identified in the existing 2008 plan. The group discussed each action individually.

Isaac then led a discussion of potential new mitigation actions for inclusion into the 2013 update. The group then discussed possible additions.

Lastly, Jon closed the meeting.

Janesville Stakeholder Meeting

August 30, 2012
9:00AM to 11:00AM
City Hall, Janesville MN

Attending:

Clinton Rogers – City Administrator
Dave Wheelock – Public Works Director
David Ulmen – Police Chief
Frank Zimprich – General Manager, Water and Electric Utility
Mike Santo – City Council Member
Nate Zimmerman – Line Foreman, Water and Electric Utility
Randy Cummins – Fire Chief
Isaac Kerry – Region Nine Development Commission
Jon Hammel – Region Nine Development Commission

Jon opened the meeting.

Isaac reviewed the city hazard rankings and the goals/strategies identified for the plan.

Isaac then led a discussion of the mitigation actions identified in the existing 2008 plan. The group discussed each action individually.

Isaac then led a discussion of potential new mitigation actions for inclusion into the 2013 update. The group then discussed possible additions.

Lastly, Jon closed the meeting.

9.3 NCDC DATA (UNEDITED)

Location or County	Date	Time	Type	Mag	Dth	Inj	Property Damage	Crop Damage
307 MNZ041 - 044 - 047>064 - 066>070 - 074>078 - 083>085 - 093	7/18/2011	12:00 PM	Excessive Heat	N/A	0	0	0K	0K
306 Waseca	7/15/2011	2:30 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
305 Waseca	7/10/2011	10:20 PM	Thunderstorm Wind	51 kts.	0	0	0K	0K
303 Waseca	7/1/2011	6:58 PM	Thunderstorm Wind	56 kts.	0	0	0K	0K
304 Waseca Muni Arpt	7/1/2011	7:00 PM	Thunderstorm Wind	54 kts.	0	0	0K	0K
302 Waseca	5/22/2011	11:59 AM	Hail	0.01 in.	0	0	0K	0K
301 Waseca	5/21/2011	11:40 PM	Thunderstorm Wind	56 kts.	0	0	0K	0K
300 St Mary	3/25/2011	18:00 PM	Flood	N/A	0	0	0K	0K
299 MNZ054 - 064 - 074>075 - 083>084 - 093	2/20/2011	7:00 AM	Winter Storm	N/A	0	0	0K	0K
298 MNZ065 - 067 - 075 - 084	12/20/2010	8:30 AM	Winter Storm	N/A	0	0	0K	0K
297 MNZ057 - 065>069 - 077 - 084	12/15/2010	21:00 PM	Winter Storm	N/A	0	0	0K	0K
296 MNZ075 - 084	12/10/2010	19:30 PM	Blizzard	N/A	0	0	0K	0K
295 MNZ066 - 076 - 084	12/3/2010	11:00 AM	Winter Storm	N/A	0	0	0K	0K
294 MNZ082>084 - 092	11/12/2010	22:00 PM	Winter Storm	N/A	0	0	0K	0K
293 MNZ041 - 066 - 084 - 093	10/26/2010	14:00 PM	High Wind	54 kts.	0	0	0K	0K
291 Waldorf	9/23/2010	2:30 AM	Flash Flood	N/A	0	0	0K	0K
292 Waldorf	9/23/2010	9:00 AM	Flood	N/A	0	0	0K	0K
290 Waldorf	9/15/2010	17:00 PM	Hail	1.25 in.	0	0	0K	0K
289 Waldorf	8/31/2010	15:57 PM	Thunderstorm Wind	56 kts.	0	0	250K	0K
288 Waldorf	7/22/2010	12:00 AM	Heavy Rain	N/A	0	0	0K	0K

287 Waseca	6/26/2010	20:44 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
285 Waldorf	6/25/2010	18:45 PM	Hail	1.75 in.	0	0	0K	0K
286 New Richland	6/25/2010	19:06 PM	Hail	1.75 in.	0	0	0K	0K
284 Waseca	6/17/2010	19:00 PM	Flash Flood	N/A	0	0	0K	0K
283 New Richland	6/17/2010	19:00 PM	Thunderstorm Wind	56 kts.	0	0	0K	0K
282 Alma City	4/12/2010	19:38 PM	Hail	0.75 in.	0	0	0K	0K
277 Janesville	3/15/2010	10:00 AM	Flood	N/A	0	0	0K	0K
278 Matawan	3/15/2010	10:00 AM	Flood	N/A	0	0	0K	0K
279 New Richland	3/15/2010	10:00 AM	Flood	N/A	0	0	0K	0K
280 Waldorf	3/15/2010	10:00 AM	Flood	N/A	0	0	0K	0K
281 Wilton	3/15/2010	10:00 AM	Flood	N/A	0	0	0K	0K
276 MNZ050 - 059>060 - 067>069 - 075>078 - 084>085 - 092	2/7/2010	12:00 PM	Winter Storm	N/A	0	0	0K	0K
274 MNZ041 - 055 - 057 - 065>067 - 073>076 - 082>085 - 091	1/25/2010	9:00 AM	Blizzard	N/A	0	0	0K	0K
275 MNZ041 - 055 - 057 - 065>067 - 073>076 - 082>085 - 091	1/25/2010	9:00 AM	Winter Storm	N/A	0	0	0K	0K
273 MNZ075>078 - 082>085 - 092	12/23/2009	17:00 PM	Winter Storm	N/A	0	0	0K	0K
272 MNZ065 - 073 - 082>085 - 091	12/8/2009	8:00 AM	Blizzard	N/A	0	0	0K	0K
267 Palmer	6/17/2009	18:30 PM	Hail	0.88 in.	0	0	0K	0K
268 Palmer	6/17/2009	19:02 PM	Hail	0.75 in.	0	0	0K	0K
269 Waseca	6/17/2009	19:02 PM	Tornado	F0	0	0	0K	0K
270 Waseca	6/17/2009	19:05 PM	Hail	0.75 in.	0	0	0K	0K
271 Waseca	6/17/2009	19:15 PM	Funnel Cloud	N/A	0	0	0K	0K
266 St Mary	5/6/2009	11:00 AM	Heavy Rain	N/A	0	0	0K	0K

265 MNZ044 - 050>051 - 059 - 068 - 076 - 083>085 - 092	1/14/2009	18:00 PM	Cold/wind Chill	N/A	0	0	0K	0K
264 MNZ084 - 093	1/12/2009	18:00 PM	Winter Storm	N/A	0	0	0K	0K
263 MNZ058 - 084 - 093	12/20/2008	13:00 PM	Winter Storm	N/A	0	0	0K	0K
262 MNZ065 - 073>075 - 082>084 - 091	12/15/2008	12:00 AM	Extreme Cold/wind Chill	N/A	0	0	0K	0K
261 MNZ084 - 092	12/9/2008	1:00 AM	Winter Storm	N/A	0	0	0K	0K
258 Janesville	7/17/2008	8:30 AM	Hail	1.00 in.	0	0	0K	0K
259 Waseca	7/17/2008	8:45 AM	Hail	1.00 in.	0	0	0K	0K
260 Waseca	7/17/2008	9:00 AM	Hail	1.00 in.	0	0	0K	0K
255 Palmer	5/31/2008	14:21 PM	Hail	0.75 in.	0	0	0K	0K
256 Palmer	5/31/2008	14:24 PM	Hail	0.75 in.	0	0	0K	0K
257 Waseca	5/31/2008	14:58 PM	Hail	1.00 in.	0	0	0K	0K
254 MNZ044 - 049>053 - 058>063 - 066>070 - 076>078 - 084	4/1/2008	12:00 AM	Heavy Snow	N/A	0	0	0K	0K
253 MNZ060>063 - 070 - 076>077 - 084	3/31/2008	9:00 AM	Heavy Snow	N/A	0	0	0K	0K
252 MNZ082>085 - 091	2/19/2008	21:00 PM	Cold/wind Chill	N/A	0	0	0K	0K
251 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091	2/10/2008	2:00 AM	Cold/wind Chill	N/A	0	0	0K	0K
250 MNZ065 - 074 - 084 - 085	12/1/2007	8:00 AM	Winter Storm	N/A	0	0	0K	0K
249 Janesville	8/21/2007	18:23 PM	Hail	0.75 in.	0	0	0K	0K
248 Waseca	8/19/2007	12:45 AM	Flash Flood	N/A	0	0	0K	0K
245 Waseca	8/11/2007	21:15 PM	Thunderstorm Wind	60 kts.	0	0	0K	0K
246 Waseca	8/11/2007	21:16 PM	Hail	1.00 in.	0	0	0K	0K
247 Waseca	8/11/2007	21:18 PM	Hail	0.88 in.	0	0	0K	0K
244 Matawan	7/3/2007	17:26 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K

243 Janesville	6/20/2007	21:53 PM	Hail	1.00 in.	0	0	0K	0K
242 Waseca	5/23/2007	15:30 PM	Hail	0.75 in.	0	0	0K	0K
241 MNZ068 - 084 - 093	5/6/2007	8:45 AM	High Wind	35 kts.	0	0	0K	0K
240 Janesville	4/30/2007	15:30 PM	Hail	0.88 in.	0	0	0K	0K
237 Waldorf	3/21/2007	17:53 PM	Hail	0.88 in.	0	0	0K	0K
238 New Richland	3/21/2007	18:11 PM	Hail	1.00 in.	0	0	0K	0K
239 Janesville	3/21/2007	18:54 PM	Hail	0.75 in.	0	0	0K	0K
236 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091	3/1/2007	12:00 AM	Winter Storm	N/A	0	0	0K	0K
235 MNZ051 - 059 - 069 - 082>085 - 091	2/23/2007	23:00 PM	Winter Storm	N/A	0	0	0K	0K
234 MNZ074 - 082 - 084 - 091	1/14/2007	14:00 PM	Heavy Snow	N/A	0	0	0K	0K
233 MNZ069 - 076 - 084	12/31/2006	11:30 AM	Winter Storm	N/A	0	0	0K	0K
232 New Richland	10/4/2006	1:30 AM	Hail	0.88 in.	0	0	0K	0K
231 Janesville	9/26/2006	8:06 PM	Hail	0.75 in.	0	0	0	0
230 Waldorf	9/16/2006	9:40 PM	Tstm Wind	52 kts.	0	0	0	0
228 Waldorf	8/24/2006	7:23 PM	Funnel Cloud	N/A	0	0	0	0
229 Waldorf	8/24/2006	7:34 PM	Hail	0.75 in.	0	0	0	0
227 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	7/30/2006	10:00 AM	Heat	N/A	0	0	0	0
224 Waseca	7/19/2006	8:40 AM	Tstm Wind	52 kts.	0	0	0	0
225 Janesville	7/19/2006	9:55 PM	Hail	0.88 in.	0	0	0	0
226 Waseca	7/19/2006	10:10 PM	Hail	1.00 in.	0	0	0	0
223 New Richland	6/14/2006	8:00 AM	Hail	1.00 in.	0	0	0	0
222 New Richland	5/8/2006	7:48 PM	Hail	1.25 in.	0	0	0	0
221 MNZ051>054 - 056>070 - 073>078 - 082>085 - 091>093	3/12/2006	12:00 PM	Winter Storm	N/A	0	0	0	0

219 Janesville	8/9/2005	2:45 PM	Tstm Wind	52 kts.	0	0	0	0
220 Waseca	8/9/2005	3:45 PM	Tstm Wind	55 kts.	0	0	0	0
214 Otisco	6/29/2005	9:17 PM	Tstm Wind	52 kts.	0	0	0	0
215 Waseca	6/29/2005	9:19 PM	Tstm Wind	52 kts.	0	0	0	0
216 Waseca	6/29/2005	9:20 PM	Hail	0.75 in.	0	0	0	0
217 Waseca	6/29/2005	9:20 PM	Lightning	N/A	0	0	0	0
218 Waseca	6/29/2005	9:20 PM	Lightning	N/A	0	0	0	0
209 Janesville	6/27/2005	5:30 PM	Funnel Cloud	N/A	0	0	0	0
210 Waseca	6/27/2005	5:52 PM	Hail	0.75 in.	0	0	0	0
211 Waldorf	6/27/2005	5:55 PM	Hail	0.75 in.	0	0	0	0
212 Waseca	6/27/2005	6:25 PM	Tstm Wind	52 kts.	0	0	0	0
213 Waseca	6/27/2005	6:33 PM	Hail	1.00 in.	0	0	0	0
208 New Richland	6/20/2005	2:55 PM	Tstm Wind	52 kts.	0	0	0	0
207 Waseca	6/8/2005	2:45 AM	Tstm Wind	52 kts.	0	0	0	0
206 Countywide	5/12/2005	9:00 PM	Heavy Rain	N/A	0	0	0	0
205 MNZ060 - 062>063 - 065>070 - 073>078 - 082>085 - 091>093	3/18/2005	12:00 AM	Winter Storm	N/A	0	0	0	0
204 MNZ041 - 047>048 - 054>058 - 064>067 - 073>077 - 082>085 - 091>093	1/21/2005	10:00 AM	Blizzard	N/A	0	0	0	0
203 MNZ044>045 - 049>070 - 073>078 - 082>085 - 091>093	1/1/2005	10:00 AM	Winter Storm	N/A	0	0	0	0
202 MNZ041>043 - 047>051 - 054>059 - 064>070 - 073>078 - 082>085 - 091>093	12/12/2004	6:00 AM	High Wind	40 kts.	0	0	0	0
201 MNZ078 - 084>085 - 091>093	9/14/2004	11:45 PM	Flood	N/A	0	0	6.7M	21.6M
200 New Richland	8/1/2004	5:30 AM	Flash Flood	N/A	0	0	0	0
199 Waseca	6/12/2004	5:43 PM	Hail	0.75 in.	0	0	0	0

194 Waseca	6/11/2004	4:20 PM	Tstm Wind	52 kts.	0	0	0	0
195 Waseca	6/11/2004	4:25 PM	Tstm Wind	52 kts.	0	0	0	0
196 New Richland	6/11/2004	4:31 PM	Funnel Cloud	N/A	0	0	0	0
197 New Richland	6/11/2004	4:32 PM	Hail	0.88 in.	0	0	0	0
198 Otisco	6/11/2004	4:40 PM	Hail	0.75 in.	0	0	0	0
193 MNZ075>076 - 083>084	6/9/2004	3:15 AM	Flood	N/A	0	0	0	0
191 MNZ053 - 060>063 - 067>070 - 073>078 - 082>085 - 091>093	4/18/2004	1:00 PM	High Wind	52 kts.	0	0	0	0
192 Janesville	4/18/2004	7:07 PM	Tstm Wind	52 kts.	0	0	0	0
190 MNZ060 - 062>063 - 068>070 - 076>078 - 083>085 - 091>093	3/5/2004	12:00 AM	Winter Storm	N/A	0	0	0	0
189 MNZ044>045 - 051>052 - 059>063 - 065>070 - 073>078 - 082>085 - 091>093	2/1/2004	2:00 AM	Winter Storm	N/A	0	0	0	0
188 MNZ041>045 - 047>052 - 054>070 - 073>078 - 082>085 - 091>093	1/24/2004	9:00 PM	Winter Storm	N/A	0	0	0	0
187 MNZ053 - 060>063 - 065>070 - 073>078 - 083>085 - 091>093	12/9/2003	3:00 AM	Winter Storm	N/A	0	0	0	0
186 Janesville	8/21/2003	1:30 AM	Tstm Wind	60 kts.	0	0	50K	0
184 Janesville	7/14/2003	7:55 PM	Tornado	F0	0	0	0	0
185 Waseca Muni Arpt	7/14/2003	8:07 PM	Funnel Cloud	N/A	0	0	0	0
182 New Richland	7/4/2003	1:25 AM	Tstm Wind	50 kts.	0	0	0	0
183 Waseca	7/4/2003	1:30 AM	Tstm Wind	52 kts.	0	0	0	0
181 MNZ041 - 047>048 - 054>057 - 064>067 - 073>076 - 082>085 - 091>093	2/11/2003	11:00 AM	Blizzard	N/A	0	0	0	0
179 Waseca	7/30/2002	3:55 PM	Hail	1.75 in.	0	0	0	0

180 St Mary	7/30/2002	4:50 PM	Hail	1.00 in.	0	0	0	0
176 Janesville	6/25/2002	11:45 PM	Hail	0.75 in.	0	0	0	0
177 Janesville	6/25/2002	11:45 PM	Tstm Wind	50 kts.	0	0	0	0
178 Waseca Muni Arpt	6/25/2002	11:58 PM	Tstm Wind	50 kts.	0	0	0	0
175 Waseca	6/12/2002	3:14 PM	Hail	0.88 in.	0	0	0	0
174 Janesville	5/28/2002	12:54 PM	Tstm Wind	52 kts.	0	0	0	0
172 Janesville	5/8/2002	1:55 PM	Hail	0.75 in.	0	0	0	0
173 Waseca	5/8/2002	2:00 PM	Hail	1.75 in.	0	0	0	0
171 MNZ042>045 - 048>070 - 073>078 - 082>085 - 091	3/14/2002	8:00 AM	Winter Storm	N/A	0	0	0	0
170 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	3/8/2002	6:00 PM	Winter Storm	N/A	0	0	0	0
169 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	8/4/2001	12:00 PM	Excessive Heat	N/A	5	0	0	0
168 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	8/1/2001	12:00 AM	Excessive Heat	N/A	1	0	0	0
167 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	7/30/2001	9:00 AM	Excessive Heat	N/A	0	0	0	0
165 New Richland	6/18/2001	7:10 PM	Hail	1.75 in.	0	0	0	0
166 Waseca	6/18/2001	7:13 PM	Hail	0.75 in.	0	0	0	0
164 New Richland	5/9/2001	6:33 PM	Hail	1.00 in.	0	0	0	0
158 Waseca	5/1/2001	4:28 PM	Hail	1.00 in.	0	0	0	0
159 Waldorf	5/1/2001	4:30 PM	Funnel Cloud	N/A	0	0	0	0
160 Otisco	5/1/2001	4:41 PM	Funnel Cloud	N/A	0	0	0	0
161 Waseca	5/1/2001	4:46 PM	Hail	1.00 in.	0	0	0	0
162 Waseca	5/1/2001	4:50 PM	Hail	1.25 in.	0	0	0	0
163 Waseca	5/1/2001	5:05 PM	Hail	1.50	0	0	0	0

				in.				
157 MNZ063 - 067 - 069>070 - 073>078 - 082>085 - 091>093	4/7/2001	8:00 AM	High Wind	69 kts.	0	0	8.0M	0
156 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	4/1/2001	12:00 PM	Flood	N/A	3	1	200.0M	0
155 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	3/30/2001	12:00 AM	Fog	N/A	0	0	0	0
154 MNZ041>045 - 047>052 - 054>059 - 064>069 - 073>077 - 082>085 - 091>093	2/24/2001	5:00 PM	Winter Storm	N/A	0	0	0	0
153 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	1/29/2001	7:00 PM	Winter Storm	N/A	0	0	0	0
152 MNZ041>045 - 047>053 - 055>063 - 065>070 - 076>078 - 084>085 - 093	12/28/2000	2:00 AM	Winter Storm	N/A	0	0	0	0
151 MNZ041 - 047>049 - 054>060 - 062>070 - 073>078 - 082>085 - 091>093	4/5/2000	9:00 PM	High Wind	64 kts.	0	0	0	0
150 MNZ054>070 - 073>078 - 082>085 - 091>093	1/19/2000	5:30 AM	Heavy Snow	N/A	0	0	0	0
149 MNZ070 - 073>078 - 082>085	10/1/1999	5:00 PM	Early Snowfall	N/A	0	0	0	0
148 Waseca	9/7/1999	5:16 PM	Hail	1.00 in.	0	0	0	0
147 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	7/29/1999	3:00 AM	Excessive Heat	N/A	0	0	0	0
146 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	7/23/1999	10:00 AM	Excessive Heat	N/A	1	0	0	0
145 Matawan	6/5/1999	7:45 PM	Tstm Wind	57 kts.	0	0	0	0

144 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	3/17/1999	11:00 AM	High Wind	55 kts.	0	0	0	0
143 MNZ041 - 041>045 - 045 - 047>050 - 050>052 - 052>053 - 053>054 - 054>056 - 056>057 - 057>060 - 060>066 - 066>068 - 068>070 - 070 - 073>074 - 074>076 - 076>078 - 078 - 082>083 - 083>085 - 091 - 091>092	3/8/1999	12:30 AM	Winter Storm	N/A	0	0	0	0
142 MNZ077>078 - 084>085 - 093	1/22/1999	1:00 AM	Winter Storm	N/A	0	0	0	0
141 MNZ047 - 054>057 - 064>065 - 073>075 - 082>085 - 091>093	1/17/1999	9:00 PM	Winter Storm	N/A	0	0	0	0
140 MNZ047>049 - 054>058 - 060 - 064>070 - 073>078 - 082>085 - 091>093	1/1/1999	11:00 AM	Heavy Snow	N/A	0	0	0	0
139 MNZ041 - 047>050 - 054>057 - 064>065 - 073>075 - 082>085 - 091>093	11/10/1998	12:00 PM	High Wind	60 kts.	0	2	0	0
134 Matawan	6/27/1998	4:55 PM	Hail	0.75 in.	0	0	0	0
135 Waldorf	6/27/1998	4:55 PM	Hail	1.00 in.	0	0	0	0
136 New Richland	6/27/1998	5:20 PM	Tstm Wind	61 kts.	0	0	0	0
137 New Richland	6/27/1998	5:25 PM	Hail	0.75 in.	0	0	0	0
138 Waseca	6/27/1998	5:29 PM	Tstm Wind	56 kts.	0	0	0	0
133 Waseca	6/25/1998	12:25 AM	Hail	0.75 in.	0	0	0	0
132 Janesville	5/18/1998	10:47 PM	Hail	0.75 in.	0	0	0	0
131 Waseca	4/6/1998	5:35 PM	Hail	0.75 in.	0	0	0	0

130 MNZ063 - 069>070 - 076>078 - 083>085 - 091>093	1/4/1998	2:00 PM	Ice Storm	N/A	0	0	0	0
129 New Richland	7/20/1997	6:30 PM	Funnel Cloud	N/A	0	0	0	0
128 Janesville	7/18/1997	7:10 AM	Hail	0.75 in.	0	0	0	0
127 New Richland	7/5/1997	4:57 PM	Hail	0.75 in.	0	0	0	0
126 MNZ047 - 054>057 - 064>066 - 073>077 - 082>085 - 091>093	4/6/1997	7:00 AM	High Wind	51 kts.	0	0	0	0
125 MNZ041>045 - 048>053 - 059>063 - 068>070 - 076>078 - 084>085 - 093	3/13/1997	12:00 AM	Winter Storm	N/A	0	0	0	0
124 MNZ041>042 - 047>048 - 054>057 - 064>065 - 073>074 - 082>085 - 091>093	1/22/1997	4:00 AM	Winter Storm	N/A	0	0	0	0
122 MNZ041 - 047>048 - 054>057 - 064>065 - 073>075 - 082>085 - 091>093	1/15/1997	4:00 PM	Blizzard	N/A	0	0	0	0
123 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	1/15/1997	5:00 PM	Extreme Windchill	N/A	0	0	0	0
121 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	12/24/1996	6:00 PM	Extreme Cold	N/A	0	0	0	0
120 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	12/23/1996	5:00 AM	Winter Storm	N/A	1	0	0	0
119 MNZ049>054 - 056>070 - 073>078 - 082>085 - 091>093	12/14/1996	1:00 PM	Heavy Snow	N/A	0	0	0	0
118 MNZ054 - 056>070 - 073>078 - 082>085 - 091>093	11/22/1996	9:00 PM	Heavy Snow	N/A	0	0	0	0
117 MNZ041>044 - 047>070 - 074>078 - 082>085 - 091>093	11/20/1996	2:00 AM	Heavy Snow	N/A	0	0	0	0

116 MNZ065>070 - 073>078 - 082>085 - 091>093	11/14/1996	10:00 PM	Ice Storm	N/A	0	0	0	0
115 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	10/29/1996	9:00 PM	High Wind	64 kts.	0	0	0	0
114 Waseca	5/19/1996	12:38 AM	Tstm Wind	86 kts.	0	0	4.0M	0
113 MNZ042>045 - 049>054 - 056>070 - 073>079 - 082>087 - 091>093	3/23/1996	9:00 PM	Heavy Snow	N/A	0	0	0	0
112 MNZ041 - 047>048 - 054>057 - 064 - 067 - 074>079 - 082>088 - 091>096	2/10/1996	9:00 AM	High Wind	48 kts.	0	0	0	0
111 MNZ041>045 - 047>070 - 073>079 - 082>088 - 091>096	2/1/1996	12:00 AM	Extreme Cold	N/A	0	0	0	0
110 MNZ041>045 - 047>070 - 073>079 - 082>088 - 091>096	1/31/1996	4:00 AM	Extreme Cold	N/A	0	0	0	0
109 MNZ041 - 047>048 - 054>057 - 064>065 - 073>078 - 082>088 - 091>096	1/28/1996	11:00 PM	Blizzard	N/A	0	0	0	0
108 MNZ074>079 - 082>088 - 091>096	1/25/1996	2:00 AM	Heavy Snow	N/A	0	0	0	0
107 MNZ041>045 - 047>070 - 073>078 - 082>085 - 091>093	1/18/1996	6:00 PM	Extreme Windchill	N/A	0	0	0	0
106 MNZ077>078 - 084>088 - 093>096	1/17/1996	2:00 PM	Heavy Snow	N/A	0	0	0	0
105 MNZ058>063 - 065>070 - 074>079 - 083>086	1/10/1996	1:00 PM	Heavy Snow	N/A	0	0	0	0
104 Central And South Mn	12/13/1995	200	Glaze	N/A	0	0	0	0
102 Central And South Mn	12/8/1995	300	Heavy Snow	N/A	0	0	0	0

103 Central And South Mn	12/8/1995	1400	Low Wind Chill	N/A	0	0	0	0
99 Waldorf	7/27/1995	930	Thunderstorm Winds	70 kts.	0	0	0	0
100 Waldorf	7/27/1995	939	Thunderstorm Winds	82 kts.	0	0	0	0
101 Otisco	7/27/1995	958	Thunderstorm Winds	52 kts.	0	0	0	0
98 Waseca And	7/14/1995	1655	Thunderstorm Winds	52 kts.	0	0	0	0
97 South And Portions Of	7/10/1995	1300	Heat Wave	N/A	2	0	2.0M	0
96 MNZ038 - 049>052 - 054>060 - 064>068 - 072 - 073 - 079 - 084>088 - 091>096	3/6/1995	0	Heavy Snow	N/A	0	0	0	0
95 MNZ020 - 021 - 029>098	11/27/1994	500	Heavy Snow/ice	N/A	0	0	0	0
94 MNZ075>079 - 083>088 - 092>096	11/18/1994	700	High Wind	52 kts.	0	0	0	0
90 WASECA	8/7/1994	1925	Funnel Cloud	N/A	0	0	0	0
91 WASECA	8/7/1994	1930	Hail	1.75 in.	0	0	0	0
92 Waterville	8/7/1994	1930	Tornado	F1	0	0	0	0
93 Waterville	8/7/1994	1935	Hail	2.00 in.	0	0	0	0
88 Waldorf	6/30/1994	2105	Thunderstorm Winds	0 kts.	0	0	5K	0
89 New Richland	6/30/1994	2110	Funnel Cloud	N/A	0	0	0	0
87 New Richland	6/17/1994	1810	Thunderstorm Winds	0 kts.	0	0	50K	0
86 Waseca	5/24/1994	1758	Funnel Clouds	N/A	0	0	0	0
85 MNZ011 - 012 - 018>021 - 025 - 026 - 032>038 - 040>096	4/28/1994	400	Heavy Snow And Ice	N/A	0	0	0	0
84 Southern Mn	4/15/1994	900	High Wind	0 kts.	0	0	0	0
83 MNZ039 - 046 - 054 - 064 - 071 - 073 - 076 - 077 - 080 - 083>085 - 089 - 091>094 - 097 - 098	1/26/1994	2000	Heavy Snow	N/A	0	0	0	0
82 All Of Minnesota	1/15/1994	100	Extreme Cold	N/A	1	0	0	0

81 Waseca	8/18/1993	700	Thunderstorm Winds	0 kts.	0	0	0	0
80 WASECA	8/7/1991	1932	Tstm Wind	0 kts.	0	0	0	0
79 WASECA	5/28/1991	845	Tstm Wind	0 kts.	0	0	0	0
78 WASECA	9/7/1990	610	Tstm Wind	0 kts.	0	0	0	0
77 WASECA	6/27/1990	1120	Tstm Wind	52 kts.	0	0	0	0
76 WASECA	6/2/1990	1030	Tstm Wind	61 kts.	0	0	0	0
75 WASECA	8/4/1989	1718	Hail	1.00 in.	0	0	0	0
74 WASECA	8/21/1987	103	Hail	1.00 in.	0	0	0	0
73 WASECA	8/15/1987	2325	Tstm Wind	74 kts.	0	0	0	0
71 WASECA	7/27/1987	1727	Tstm Wind	70 kts.	0	0	0	0
72 WASECA	7/27/1987	1743	Tstm Wind	63 kts.	0	0	0	0
70 WASECA	7/14/1987	1835	Tornado	F0	0	0	0K	0
68 WASECA	7/10/1987	40	Tstm Wind	0 kts.	0	0	0	0
69 WASECA	7/10/1987	110	Tstm Wind	79 kts.	0	0	0	0
67 WASECA	6/15/1986	2035	Hail	1.75 in.	0	0	0	0
65 WASECA	4/26/1986	2213	Tstm Wind	59 kts.	0	0	0	0
66 WASECA	4/26/1986	2230	Tstm Wind	0 kts.	0	0	0	0
63 WASECA	9/8/1985	1741	Hail	1.00 in.	0	0	0	0
64 WASECA	9/8/1985	1741	Hail	1.00 in.	0	0	0	0
62 WASECA	7/3/1985	2043	Hail	1.00 in.	0	0	0	0
61 WASECA	3/26/1985	1010	Hail	1.75 in.	0	0	0	0
59 WASECA	7/14/1984	1353	Tstm Wind	60 kts.	0	0	0	0
60 WASECA	7/14/1984	1502	Tstm Wind	0 kts.	0	0	0	0
58 WASECA	6/7/1984	1820	Tornado	F1	0	0	3K	0
56 WASECA	6/4/1984	1437	Tornado	F1	0	0	250K	0
57 WASECA	6/4/1984	1455	Tstm Wind	0 kts.	0	0	0	0
55 WASECA	4/26/1984	1945	Tstm Wind	50 kts.	0	0	0	0
54 WASECA	6/30/1983	2000	Tstm Wind	0 kts.	0	0	0	0
53 WASECA	6/13/1983	2031	Tornado	F0	0	0	25K	0
52 WASECA	7/6/1982	1628	Hail	1.50	0	0	0	0

				in.				
51 WASECA	5/4/1982	1605	Tstm Wind	0 kts.	0	0	0	0
50 WASECA	7/21/1981	1720	Hail	1.75 in.	0	0	0	0
49 WASECA	6/28/1981	1757	Hail	1.75 in.	0	0	0	0
48 WASECA	6/23/1981	1800	Hail	1.75 in.	0	0	0	0
45 WASECA	6/14/1981	510	Tstm Wind	58 kts.	0	0	0	0
46 WASECA	6/14/1981	1942	Hail	1.75 in.	0	0	0	0
47 WASECA	6/14/1981	1958	Hail	1.00 in.	0	0	0	0
44 WASECA	6/13/1981	2145	Tstm Wind	52 kts.	0	0	0	0
43 WASECA	4/30/1981	1320	Tstm Wind	61 kts.	0	0	0	0
41 WASECA	4/27/1981	2345	Hail	1.50 in.	0	0	0	0
42 WASECA	4/27/1981	2345	Hail	1.75 in.	0	0	0	0
39 WASECA	9/20/1980	1735	Hail	1.75 in.	0	0	0	0
40 WASECA	9/20/1980	1745	Tstm Wind	0 kts.	0	0	0	0
37 WASECA	8/18/1980	30	Tstm Wind	0 kts.	0	0	0	0
38 WASECA	8/18/1980	30	Tstm Wind	56 kts.	0	0	0	0
36 WASECA	6/27/1980	1735	Hail	1.00 in.	0	0	0	0
35 WASECA	7/22/1979	1639	Tstm Wind	52 kts.	0	0	0	0
33 WASECA	6/28/1979	1800	Hail	1.50 in.	0	0	0	0
34 WASECA	6/28/1979	1810	Tornado	F1	0	0	250K	0
31 WASECA	6/19/1979	2015	Tstm Wind	0 kts.	0	0	0	0
32 WASECA	6/19/1979	2035	Tstm Wind	0 kts.	0	0	0	0
30 WASECA	9/12/1978	800	Tstm Wind	0 kts.	0	0	0	0
28 WASECA	8/1/1978	1930	Tornado	F1	0	1	2.5M	0
29 WASECA	8/1/1978	2020	Hail	1.00 in.	0	0	0	0
26 WASECA	4/3/1978	2000	Hail	1.50 in.	0	0	0	0
27 WASECA	4/3/1978	2000	Hail	1.75 in.	0	0	0	0
25 WASECA	7/6/1977	1045	Tstm Wind	52 kts.	0	0	0	0
23 WASECA	5/15/1977	2330	Hail	0.75 in.	0	0	0	0

24 WASECA	5/15/1977	2330	Tstm Wind	61 kts.	0	0	0	0
22 WASECA	4/14/1977	1520	Hail	2.50 in.	0	0	0	0
21 WASECA	6/25/1976	1845	Hail	1.00 in.	0	0	0	0
20 WASECA	9/10/1975	2205	Tstm Wind	60 kts.	0	0	0	0
19 WASECA	7/5/1975	2100	Hail	0.75 in.	0	0	0	0
18 WASECA	6/18/1974	1800	Hail	1.50 in.	0	0	0	0
17 WASECA	4/20/1974	1945	Tstm Wind	0 kts.	0	0	0	0
15 WASECA	7/23/1973	1926	Tornado	F0	0	0	3K	0
16 WASECA	7/23/1973	1950	Tornado	F1	0	0	25K	0
14 WASECA	6/18/1973	635	Tornado	F0	0	0	3K	0
12 WASECA	6/15/1970	1830	Hail	2.50 in.	0	0	0	0
13 WASECA	6/15/1970	1830	Tstm Wind	0 kts.	0	0	0	0
11 WASECA	4/29/1970	1732	Tornado	F2	0	0	250K	0
10 WASECA	8/6/1968	1730	Tstm Wind	0 kts.	0	0	0	0
9 WASECA	7/23/1968	300	Hail	1.25 in.	0	0	0	0
7 WASECA	5/15/1968	1600	Hail	1.75 in.	0	0	0	0
8 WASECA	5/15/1968	1600	Tstm Wind	0 kts.	0	0	0	0
4 WASECA	4/30/1967	1800	Tornado	F2	0	0	25.0M	0
5 WASECA	4/30/1967	1815	Tornado	F3	0	0	25.0M	0
6 WASECA	4/30/1967	1900	Tornado	F4	6	22	25.0M	0
3 WASECA	6/9/1963	1745	Tornado	F2	0	0	250K	0
2 WASECA	5/14/1961	1716	Tornado	F2	0	1	250K	0
1 WASECA	8/14/1958	2115	Hail	1.75 in.	0	0	0	0

9.4 MARKETING

Example advertisement for community meetings:

Community Meeting

Waseca County All-Hazard Mitigation Plan Update

Wednesday July 18, 2012
10a.m. to Noon
Waseca County East Annex
300 State Street
Waseca MN 56093

The Waseca County All-Hazard Mitigation Plan Steering Committee invites you to attend a community meeting to evaluate and discuss the goals, strategies, and projects to be included in the updated plan. **The mitigation projects listed in this plan will be eligible for future federal funding assistance.**

As a result of the Disaster Mitigation Act of 2000, FEMA now requires that in order to continue to be eligible for hazard mitigation grand funding, Waseca County and cities within Waseca County must update their All-Hazard Mitigation Plan every five years. Waseca County Emergency Management, with assistance from Region 9 Development Commission, is in the process of updating the original plan. The formulation of goals and strategies, and the identification of projects is one of the final steps in the planning process.

Questions may be directed to Dennis Dinneen (phone 507-835-0690, email dennis.dinneen@co.waseca.mn.us) or Jon Hammel (phone 507-389-8863, email jon@rndc.org).

The update process is supported by financial assistance from FEMA.

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Homeland Security and Emergency Management

9.5 SURVEY MATERIALS

Example of blank survey questionnaire:

WASECA COUNTY EMERGENCY MANAGEMENT

Hazard Mitigation Update - Survey of Local Communities

Dennis Dinneen
Emergency Management Director
507-835-0690
dennis.dinneen@co.waseca.mn.us

Jon Hammel
Hazard Mitigation Planner
507-389-8863
jon@rndc.org

Part 1 – Preliminary Questions

1. Name of Jurisdiction.

2. Names and titles of those contributing to the completion of this survey.

3. Does your community participate in the National Flood Insurance Program? *(FEMA §201.6(c)(3)(ii))*

4. Since 2003 (when this planning process was last conducted), has your community taken any action to mitigate the occurrence or impact of any hazard? If yes, please describe and provide an approximate year. For example, infrastructure upgrades are an example of a potential hazard mitigation measures. *(FEMA §201.6(c)(3)(iii))*

5. Have you identified any actions that would reduce the occurrence or impact of any hazard but you have not yet implemented them? If yes, please list and describe. *(FEMA §201.6(c)(3)(iii))*
    a. What has prevented the implementation of these identified mitigation actions? *(FEMA §201.6(c)(3)(iii))*

6. Have there been any repetitive losses due to any hazard? If yes, please list and describe. Examples could include the reoccurring loss of roads, utilities, public buildings, dwellings, parks, or private businesses. *(FEMA §201.6(c)(2)(ii))*
    a. Please include an estimate of the potential dollar cost associated with any repetitive losses and a description of the method used to calculate this estimate. *(FEMA §201.6(c)(2)(ii)(B))*

7. Are there existing buildings, infrastructure and critical facilities located in potential hazard areas? If yes, please list and describe. *(FEMA §201.6(c)(2)(ii)(A))*

8. Please list and describe any future buildings, infrastructure, and critical facilities that may be in a potential hazard area? *(FEMA §201.6(c)(2)(ii)(A))*

9. Please list the hazard events that have occurred in your community within the last 50 years (to the best of your knowledge & ability). Please provide locations, dates of occurrences, and cost estimates for losses. Examples may include floods, tornadoes, hail, etc. If the method of loss estimation differs from the method used for repetitive losses, please provide a description of the method used.

10. Please provide a copy of the community's current Land Use Map and definition of categories. *(FEMA §201.6(c)(2)(ii)(C))*

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Part 2 – Existing Policy Documents

What mechanisms for incorporating mitigation requirements into other local planning efforts are available within your community? Please check all of the policy documents listed below which may have been adopted by your community. *(FEMA §201.6(c)(4)(ii))*

Plans:

___ Local Comprehensive Plan
___ General Land Use Plan
___ Sustainability Plan
___ Capital Improvements Plan
___ Redevelopment Plan
___ Post-Disaster Redevelopment / Recovery Plan
___ Regional Development Plans
___ Watershed Protection/Enhancement Plan
___ Open Space Plan
___ Flood Mitigation Plan
___ College Campus Plans
___ Comprehensive Emergency Management Plan
___ Evacuation Plan

Codes, Regulations, & Procedures:

___ Zoning Ordinance
___ Subdivision Regulations
___ Building Code / Permitting
___ Landscape Code
___ Solid Waste & Hazardous Materials Waste Regulations
___ Tree Protection Ordinance
___ Site Plan Review
___ Architectural/Design Review
___ Storm Water Management
___ Soil Erosion Ordinance
___ Property Deed Restrictions

Programs:

___ Historic Preservation Program
___ Construction/Retrofit Program
___ Transportation Improvement/Retrofit Program
___ School District Facilities Plan
___ Environmentally Sensitive Purchase / Protection Program
___ Long-Range Recreation Facilities Program
___ Economic Development Authority
___ Land Buyout Program
___ Downtown Redevelopment Authority
___ Local and/or Regional Evacuation Programs
___ "Firewise" and other Fire Mitigation
___ Fire Rescue Long-Range Programs
___ Mutual Aid Agreement
___ Temporary Animal Relocation Program

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Part 3 – Risk Assessment

Please circle the probability and magnitude/severity that is most appropriate for each hazard type.

HAZARD	PROBABILITY *How likely is this hazard to occur in your community?*	MAGNITUDE / SEVERITY *If this hazard does occur, what level of impact will it have on your community?*
Drought	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Earthquake	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Expansive Soils	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Fire	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Flooding	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Water Supply Contamination	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Hazardous Materials Release	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Infectious Disease	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Infrastructure Failure	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Severe Summer Weather	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Severe Winter Weather	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Tornadoes	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Windstorms	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Other:	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
Other:	Unlikely / Possible / Likely / Very Likely	Negligible / Limited / Critical / Catastrophic
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