BECKER COUNTY, MN

2016
Hazard Mitigation Plan

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Section 1: Introduction

Every day, disasters threaten Becker County. Natural, technological, and human-made hazards can cause the loss of life and the loss of property, and jobs and other economic issues can be experienced.

Hazard mitigation in Becker County has become an increased priority due to an emphasis placed on preventing disasters and reducing damage prior to an actual event occurring. The stimulus of this is the Disaster Mitigation Act of 2000. The Disaster Mitigation Act of 2000 requires that units of local government (cities, townships, and counties) have an approved mitigation plan in order to receive mitigation grant funding from disasters occurring after November 1, 2004. The purposes of the Disaster Mitigation Act were fourfold:

1. Revise sections of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.
2. Govern costs of federal disaster assistance.
3. Organize a national program for pre-disaster mitigation.
4. Streamline dispensation of disaster relief.

Hazard mitigation planning is a collaborative process that jurisdictions take to develop a plan that outlines how they will protect themselves from hazards. FEMA requires that this planning process occurs in all counties in states across the nation. Failure to comply with these requirements will result in that county or local government unit not being eligible for certain aspects of federal mitigation funding.

Mitigation actions implemented today will reduce the disaster recovery dollars needed for tomorrow. Hazard mitigation breaks the recurring damage/loss cycle. Mitigation is currently accomplished in several ways: construction, prevention, planning, and education. It is through these mitigation methods that a balance between the constructed and natural environments is achieved.

The overall goals of the hazard mitigation plan for Becker County are to get people, property, jobs, and natural resources out of harm's way. The plan is organized in five related, but distinct areas that the planners believe will provide Becker County and participating jurisdictions the most flexibility to achieve the noted goals. The following sections are included:

1. **County Profile** – This chapter contains information on the County's history, demographics, physical features, infrastructure, and emergency response
2. **Hazards Profile** – This chapter identifies and profiles the various hazards addressed in the plan
3. **Risk Assessment** – This chapter provides a risk

HAZARD MITIGATION

"Hazard mitigation refers to any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazardous conditions. Making the best long-term decisions requires analytical steps that are best summarized as planning" (FEMA

assessment for each local governmental unit covered in the plan

4. **Goals, Objectives, and Mitigation Strategies** – This chapter identifies the specific mitigation steps the participating jurisdictions have committed to achieving the goals of the plan
5. **Plan Administration** – This chapter outlines how the plan will be administered, including implementation tables for chapter four.

The plan provides guidelines for dealing with present and future hazards. More specific steps are outlined in the county emergency response plans, watershed plans, county water plans and zoning ordinances. The written plan does not replace existing operational plans currently in use, but supplements them, helping to reinforce and/or improve present and future mitigation. The finished plan depicts a unified and continuous effort and commitment by many dedicated people in Becker County, all participating jurisdictions, as well as Minnesota Homeland Security Emergency Management, and FEMA.

1.1 Plan Goals and Authority

The goals of the Becker County Multi-Jurisdictional Hazard Mitigation Plan are to:

- Increase community understanding of emergency management and build support for hazard mitigation
- Develop, promote, integrate and track mitigation strategies
- Continue to improve and enhance the county's emergency management program
- Increase the economic stability, core values, and quality of services of the county
- Increase mitigation resources to eliminate or minimize harm done to people, property, jobs, and natural resources in Becker County by natural and manmade hazards

The Becker County Hazard Mitigation Plan has been developed in accordance with requirements set forth in the Disaster Mitigation Act of 2000. The Disaster Mitigation Act of 2000 establishes the framework for pre-disaster hazard mitigation planning and provides the legal basis for state, local and tribal mitigation planning requirements. The newly introduced Section 322 highlights the importance of coordinating hazard mitigation efforts among state, tribal, and local jurisdictions. Under 44 CFR §201.6 local governments must have a FEMA approved hazard mitigation plan in order to apply for and/or receive mitigation funding through existing hazard mitigation assistance programs:

1.2 Hazard Mitigation Grant Program (HMGP)

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural disasters.

The program enables mitigation measures to be implemented during the immediate recovery from a disaster. These mitigation measures include:

- Acquisition of real property from willing sellers and demolition or relocation of buildings to convert the property to open space use
- Retrofitting structures and facilities to minimize damages from high winds, flood, or other natural

hazards
- Safe room construction.
- Elevation of flood prone structures
- Development and initial implementation of vegetative management or invasive species programs
- Minor flood reduction projects that do not duplicate the flood prevention activities of other Federal agencies
- Localized flood control projects, such as certain ring levees and floodwall systems, designed specifically to protect critical facilities
- Post-disaster evaluations of potential building codes modifications
- Hazard mitigation planning

It is estimated that for every dollar spent on mitigation activities, four dollars are saved in disaster caused damages.

Congressional Budget Office (2007)

To offset the cost of mitigation activities, jurisdictions can collaborate with federal organizations and programs. The following are just two of these programs.

1.3 Pre-Disaster Mitigation (PDM)

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. These activities include:

- Voluntary acquisition of real property in flood plains and or property repeatedly damaged by flooding
- Elevation of existing public or private structures
- Construction of safe rooms for public or private structures that meet FEMA requirements
- Hydrologic and hydraulic studies/analyses
- Engineering and drainage studies for project design and feasibility
- Protective measures for utilities, water, sewer, roads and bridges, and storm water management to reduce/eliminate long-term flood risk

1.4 Flood Mitigation Assistance (FMA)

FMA implements cost-effective measures to reduce or eliminate the long-term risk of flood damage to National Flood Insurance Program (NFIP) structures. State-level agencies, tribes, and local governments are eligible sub-applicants through HSEM. Eligible projects include:

- Acquisition, structure demolition, or structure relocation with the property deed restricted for open space uses in perpetuity
- Elevation of structures
- Dry flood proofing of non-residential structures

- Minor structural flood controls activities
- Repetitive flood claims
- Severe Repetitive Loss

1.5 Participation

Effective mitigation planning does not occur in a vacuum. It requires the entire community to be involved in the mitigation planning process. Thus, the planning process and its ability to identify, engage, and include the entire community is just as important as the plan itself. Throughout the mitigation planning process, Becker County invited all of the jurisdictions to attend mitigation planning meetings, participate in workshops, and provide input and feedback in the development of the mitigation plan. The following jurisdictions were represented in updating the Becker County All-Hazard Mitigation Plan Update:

- Audubon, Detroit Lakes, Frazee, Lake Park and Becker County.

In addition to the noted jurisdictions, efforts were made to invite the public to participate in the planning process.

Section 2: Mitigation Plan Update

Effective planning efforts result in high quality and useful plans; however, written plans are only one element in the process. The planning process is as important as the plan itself. A successful planning process forges partnerships and brings together a cross-section of government agencies, the public, and other stakeholders to reach consensus on how to achieve the desired outcome or resolve a community issue.

Applying an inclusive and transparent process adds validity to the plan. The result is a common set of community values and widespread support for directing financial, technical, and human resources to an agreed upon action. The planning process was an integral part of the Becker County's Hazard Mitigation Plan. This section describes Becker County's planning process and how the hazard mitigation plan evolved.

FEMA Requirements Addressed in this Section:

Requirement
§201.6(b) An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

§201.6(b) (1) (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

§201.6(b)(2) (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

§201.6(b) (3) (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

§201.6(c)(1) [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

§201.6(c)(4)(i) [The plan maintenance process shall include a] section describing the method and schedule for monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

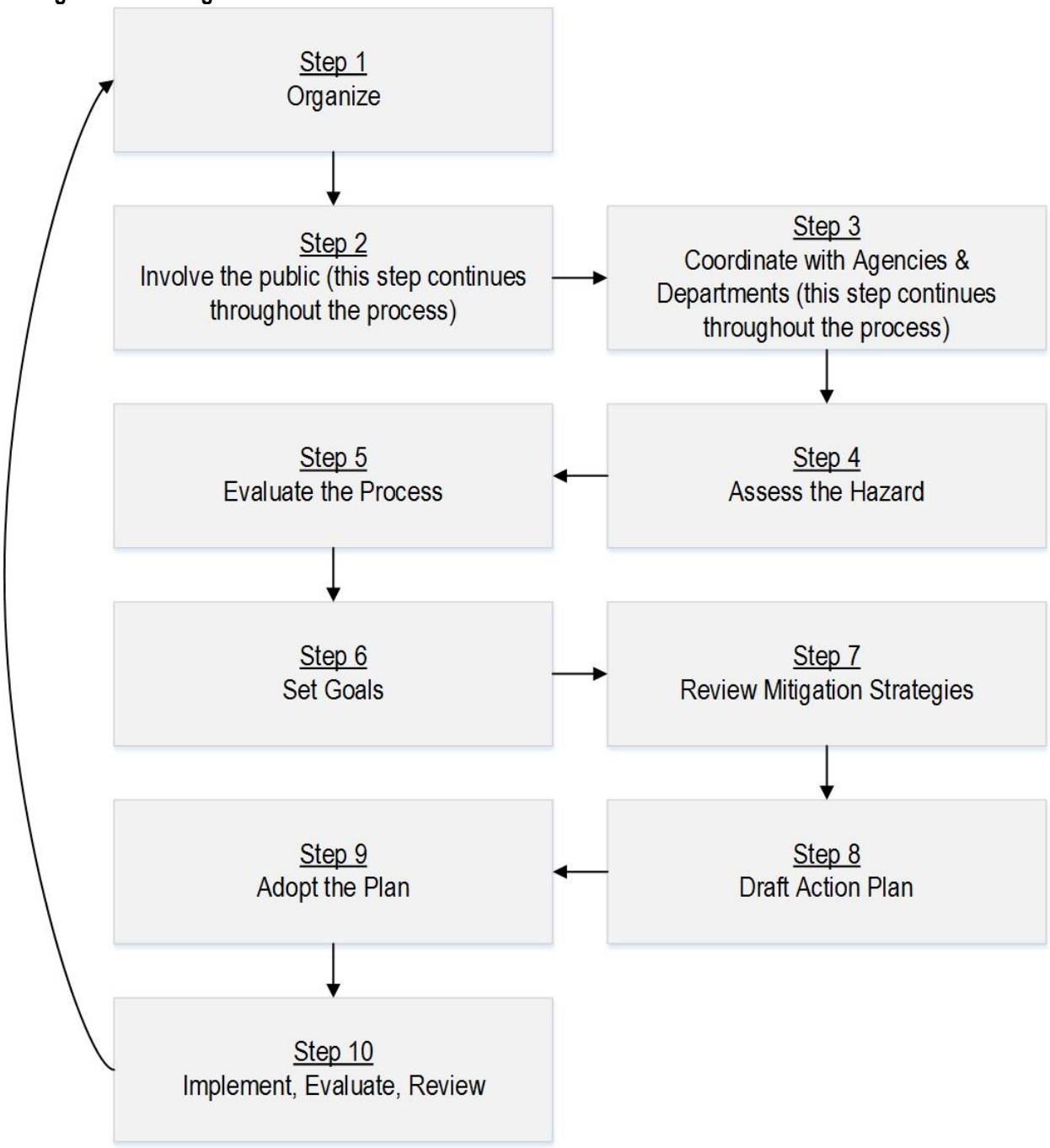
§201.6(c)(4)(iii)[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

2.1 Planning Process

To help guide the mitigation update, The Becker County Steering Committee, and by extension, the Hazard Mitigation Planning Team followed the 10-step process listed below. The planning process is based on the FEMA guidance for mitigation planning. The following graph is a visual representation of the

aforementioned planning process used throughout the plan update cycle.

Figure 1: Planning Process



In addition to the listed process, it is important to note that several key stakeholders reviewed the hazards and their effects on people and property, identified ways to reduce and prevent damage, and recommended the most appropriate and feasible measures for implementation. The Hazard Mitigation Planning Team organized the current plan and updated procedures, reviewed existing plans and programs, and coordinated with stakeholders and the public. The Hazard Mitigation Steering Committee coordinated with key agencies and other organizations to provide insight and discussion throughout the planning process.

2.1.1 Plan Administrators

Mitigation planning is an all-inclusive process, the involvement of the Becker County Emergency Manger, Hazard Mitigation Steering Committee, Hazard Mitigation Planning Team and participating jurisdictions was crucial. To accommodate this requirement, these key groups were assigned various duties and responsibilities. These responsibilities were created to ensure the mitigation plan was comprehensive, reflected the goals of Becker County, and fulfilled the requirements of the mitigation planning process. The aforementioned groups worked closely with several key stakeholders who, in turn, helped to shape the plan.

2.1.2 Emergency Manager Role and Responsibilities

Craig R Fontaine, the Becker County Emergency Manager, was ultimately responsible for completing the hazard mitigation plan update, ensuring that all identified mitigation activities were incorporated into comprehensive strategies that protect the county and its participating jurisdictions. The Becker County Emergency Manager orchestrated the update process, led the Hazard Mitigation Steering Committee and Hazard Mitigation Planning Team, as well as consolidated and solidified stakeholders across the country. The following includes a summary of the duties and responsibilities of the Emergency Manager:

- Oversee the planning process
- Ensure the Plan met the needs of the county, citizens, and complied with the code of federal regulations
- Selection of the Hazard Mitigation Steering Committee members
- Chair the Hazard Mitigation Steering Committee
- Lead the Hazard Mitigation Planning Team
- Take attendance and documenting all meetings
- Point of contact for the plan and planning process
- Ensure the plan was up to date and maintained; i.e., as outlined in the "*Maintain and Maintenance*" section of this plan
- Work within and between the participating jurisdictions and other key stakeholders to ensure the plan represented the entire county
- Ensure that participating jurisdictions were included in the planning update.
- Invite the public to participate and post all updated milestones for review and comment.

2.1.3 The Mitigation Steering Committee

A vital component of the Becker County 5-year mitigation update effort was to identify the Hazard Mitigation Steering Committee. Identification of this core group was important in ensuring implementation and support of the mitigation planning process. Hazard Mitigation Steering Committee members were chosen for their knowledge of the county, cities, and community services.

Table 1: Hazard Mitigation Steering Committee Members

Becker County Steering Committee		
Name	Organization	Title
Craig R. Fontaine	Becker County	County EM Director
Brad Grant	City of Audubon	Mayor
Bradley Green	Detroit Lakes Public Works	Director
Brady Burnside	Lake Park	Representative
Dan Holm	Citizen	Past Becker County Emergency Manager
Danny Johnson	Becker County	Courthouse Maintenance supervisor
Ed Janzen	VOAD American Red Cross	Representative
Guy Fischer	Becker County	Economic Development Coordinator Administrator
Jason Leucuta	Audubon	Fire Department / City Council
Jay Nelsen	Lake Park	Police Chief
Jim Olson	Becker County	Highway Department
Joan Stenger	Becker County	Dispatch Supervisor
John Seiling	Becker County	Chief Deputy
Jonathan Smith	Frazee	Representative
Lonnie Neuner	Lake Park	City Clerk/Treasurer
Mike Johnson	Frazee	Police Chief
Nancy Young	VOAD American Red Cross	Participant
Nick Courneya	Frazee	Public School Activities Director/ School district Representative
Patty Swenson	Becker County	Planning and Zoning
Paul Thon	Becker County	Fire chief's association president
Ranae Niemi	Becker County	Community Health
Rhonda Stock	Becker County	Community Health
Richard Goodmanson	Becker County	Safety Director
Robert Louiseau	Detroit Lakes	City Manager
Robert Strand	Detroit Lakes Police Department	Officer
Roger Hamalainen	Minn Dakota Chapter ARC	Participant
Roger Winter	Becker County	Townships President
Sean Coffman	VOAD American Red Cross	Participant
Shelly L. Dillon	Callaway	
Steve Skoog	Becker County	Deputy Emergency Manager
Steven Haaven	Wild Rice Electric	Electrical Cooperative Rep
Tim Eggebraaten	Detroit Lakes	Police Chief
Todd Glander	Becker County	Sheriff
Tom Alinder	Essentia Health Emergency department	Manager
Tom Holweger	Holmesville Township	Holmesville Township Supervisor
Brad Grant	Audubon	Mayor

Note: The Becker County Emergency Manager provided this list of Hazard Mitigation Steering Committee Members.

With regard to the mitigation planning cycle of 2016, the Hazard Mitigation Steering Committee was responsible for ensuring the following:

- Oversee the plan and ensure its relevance to the changing situation of the county

- Monitor and evaluate the mitigation strategies
- Ensure documents reflect current hazard/risk analysis, development trends, code changes and risk perceptions of the county
- Ensure the plan was up to date and maintained as outlined within the plan
- Provided guidance to the Hazard Mitigation Planning Team
- Approve the plan update and processes used to complete the plan

2.1.4 Hazard Mitigation Planning Team

The Hazard Mitigation Planning Team provided technical guidance, documented the planning process, and wrote the mitigation plan update. The Becker County Emergency Manager served as the coordinating entity of the Hazard Mitigation Planning Team.

The Hazard Mitigation Planning Team facilitated the overall plan development to ensure the Hazard Mitigation Plan and Becker County met the requirements of DMA 2000. Beyond administration, content organization, and text development, the following duties summarize the Hazard Mitigation Planning Team's responsibilities.

- Organize and guide all meetings
- Review all documents provided by the EM and participating jurisdictions
- Provide technical assistance
- Guide the plan development to adhere to DMA 2000 requirements
- Modeled disasters
- Conduct a capability assessment
- Conduct a risk assessment
- Create a hazard and community profile
- Attend and facilitate all the Hazard Mitigation Steering Committee meetings

Table 2: Hazard Mitigation Planning Team Table

Becker County Planning Team		
5-year Update		
Member	**Organization**	**Title**
Craig R. Fontaine	Becker County	Emergency Manager
Micheal Kemp	Integrated Solutions Consulting	Project Manager
Kimberly Pleva-Berka	Integrated Solutions Consulting	Planner

2.1.5 Participating Jurisdictions

Another important aspect of the planning administration process was the inclusion and involvement of the participating jurisdictions. With regard to the 2016 planning cycle, the following participating jurisdictions participated in the planning efforts of the Becker County Multi-jurisdictional Hazard Mitigation Plan.

The participating jurisdictions participated in the plan by providing information, attending meetings and giving

Table 3: Participating Jurisdictions

Participating Jurisdictions
Audubon, Callaway, Detroit Lakes, Frazee, Lake Park, and Becker County.

substantive feedback regarding their jurisdiction and the overall mitigation plan update process. The participating jurisdictions were key participants in the general planning process, hazard identification, risk assessments and the mitigation strategy update process.

The participating jurisdictions were responsible for the following:

- Ensure their participation in the mitigation planning process
- Provide relevant information pertinent to their jurisdictions
- Ensure that within their own jurisdictions, the mitigation plan would be integrated into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- Work with the Becker County Emergency Manager and mitigation planning committee as part of the iterative planning process
- Providing information concerning past mitigation actions and creating new mitigation actions
- Providing comment and review of the plan's community profile, hazard profile, risk assessment, capability assessment, mitigation goals, and maintenance and management section

Each jurisdiction participating in the plan update acted as an official conduit between their respective cities and their citizens. The insight offered by, and provided to the Hazard Mitigation Planning Team by the jurisdictions was invaluable in ensuring the plan represented the entire county.

2.1.6 Meetings and Participation

To kick off the planning process, a series of conference calls were held between Becker County personnel and the mitigation planner. These meetings helped organize the planning process. During these meetings, goals of the planning update were created, priorities were set, responsibilities delegated, key stakeholders and public participants were identified.

While the kickoff meeting discussed several issues, some of the key outcomes included the following important planning details:

- Due to concerns with time commitments and available county resources, it was communicated to the Hazard Mitigation Planning Team that correspondence would be in electronic format as much as possible (web pages, conference calls, electronic document management systems and email)
- It was communicated that the Becker County Emergency Manager would be responsible for the development of the plan
- To ensure the involvement of the county stakeholders, the planning process would be iterative
- It was understood that the county would be responsible for ensuring participation and providing requested documents and resources needed to complete the planning process
- It was decided that the county would be responsible for initiating all communication between the Hazard Mitigation Planning Team and stakeholders
- The planner noted that it would be the Becker County's responsibility to take and keep all records, notes and attendance of all meetings. In addition, it was noted the Becker County Emergency Manager would provide a matrix of the noted meetings to be included in the written plan update
- The Hazard Mitigation Planning Team would complete a community profile, hazard profile, risk assessment, capability assessment, and update mitigation actions as per their contract with Becker County

At the request of the Becker County Emergency Manager, meetings were to serve as both planning and steering meetings. Furthermore, it was requested that the planner starts each meeting with a tutorial concerning general mitigation and concepts. While those attending are experts of their community and areas of reasonability, it was a concern that those attending the meetings had limited experience and knowledge of the hazard mitigation process. The agenda for the rest of the meetings included an overview of the actual planning process, updates of the planning process and comment and approval of various sections of the plan.

To ensure open communication and input, all of the noted meetings were open to the public. Furthermore, invitations for the outlined meetings included announcements via the county and city websites, postings in the paper of record, mass emails, and direct invites. The following is an outline of the agreed upon "five" set meetings.

Table 4: Five-Set Meetings Table

Set Meetings Meeting Number	1	2	3	4	5
Date	10/16/2013	12/5/2013	2/25/2015	4/6/2016	5/16/ 2016
Location	Detroit Lakes MN	Detroit Lakes	Detroit Lakes	Detroit Lakes	Detroit Lakes
Meeting Focus	Kickoff Meeting	Community Profile	Risk Assessment	Mitigation Actions	Plan Approval

Meeting One (October 16, 2013): The focus of the meeting was to set the stage of the planning process, set expectations, and to ensure the plan would accurately represent the makeup of the county and participating jurisdictions. An invitation to this meeting was provided to all of the participating jurisdictions and city and county organizations. The Becker County Emergency Manager sent the invitations and city information using existing county contacts.

The meeting was well attended and input from those in attendance proved invaluable. The Hazard Mitigation Planning Team provided an introduction of the planning process, a general understanding of mitigation, and introduced the concept of the community profile.

The Hazard Mitigation Planning Team also provided an overview of the planning process and suggested a timeline for completion. The Hazard Mitigation Planning Team reviewed the mitigation crosswalk and noted that the required elements of the plan. Finally, the Hazard Mitigation Planning Team discussed the iterative process, placing an emphasis on the importance of feedback, input, and communication.

Outcomes: The major outcome of the meeting was the understanding that the Hazard Mitigation Planning Team would provide drafts of the community profile for review. It was noted the Hazard Mitigation Planning Team and stakeholders would create the community profile (and subsequent sections of the plan) using an iterative process. The Hazard Mitigation Planning Team provided the community profile in draft form and the stakeholders provided comments and added additional county-owned information to provide additional context and accurately portray the local perspective.

Other outcomes of the meeting concerned the issue of notification and participation. It was understood that the emergency manager would use several methods to inform the public of the mitigation process with the primary source of public information being outreach. The Hazard Mitigation Planning Team suggested that each jurisdiction places an announcement on their respective web pages informing the public that the

mitigation update process had begun, how and where to participate, points of contact, and meeting dates. The Hazard Mitigation Planning Team further advised each jurisdiction to request that the mitigation planning process and noted information be added as an item in their respective city council meetings as an official agenda item (NOTE: Council agenda items are typically reported and listed in the Becker County's paper of record). Finally, it was suggested for those jurisdictions that have a regular newsletter to include information about the mitigation planning projects. To ensure everyone's efforts were coordinated and recorded, it was requested that all the actions used to encourage participation to be reported to the emergency manager.

Meeting Two (December 5, 2013): The purpose of the second meeting was to present the findings of the community profile, present the preliminary data of the hazard profile, discuss the relationship of hazards and disasters, finalize the hazards to be completed in the Becker County Mitigation Plan and present the methods and instruments used to conduct both a capability assessment and a risk assessment. Outcomes of the meeting included accepting the community profile and approval of the various assessment data collection methods and processes.

Note: This meeting was open to the public with the public being invited via the County Paper of Record.

Outcomes: Outcomes of the meeting included feedback regarding the community profile, deciding on which hazards should be included in the Becker County Hazard Mitigation Plan, how hazards should be arranged in the Becker County Hazard Mitigation Plan, how risk should be calculated, presented and determine what hazards should be expounded upon. Also decided up was the capability assessment survey. Finally, it was agreed that the Emergency Manager would ensure all participating jurisdiction were aware of the update process and complied with the planning teams request to participate.

Meeting Three (February 25, 2015): The meetings included a progress update on the mitigation planning process, an overview of the risk and capability assessment results, and the introduction and initial assessment of mitigation actions.

Beyond approving the results of the assessments, this meeting allowed discussion of mitigation actions. Specifically discussed was how the mitigation plan assists jurisdictions (qualifying for funding, etc.) documentation of past mitigation actions, areas of improvement, and which mitigation actions should be included in the plan. To facilitate the creation of mitigation actions, the Hazard Mitigation Planning Team conducted a brief training on mitigation strategies. The overview included the following topics:

- How to understand the risk assessment
- The connection of risk hazard and the community profile
- Creating strategy goals

Outcomes: It was noted that the jurisdictions would communicate with the Becker County Emergency Manager and provide feedback concerning the completed risk and capability assessments. In addition, new mitigation goals were created. Finally, participants were instructed to work within their jurisdictions to identify new mitigation actions to be included in this iteration of the mitigation plan. Note Two additional follow-up meetings were held on these issues (3/11/2015 & 5/15/2015).

Meeting Four (April 6, 2016): All of the participating jurisdictions were requested to send a representative

to the meeting. The call for representation was made to ensure all participating jurisdictions understood the planning process, their commitment, and update them on what had been accomplished to date. This meeting also provided them with the tools and knowledge to assist in finalizing mitigation projects and completing the plan.

Outcomes: The final mitigation projects were identified and the mitigation plan less the planning section was approved for a final edit. It was noted the emergency manager would place the final mitigation plan on the county website to make the mitigation plan available for public input. Upon the public input phase, the planning team would ready the plan for final approval.

Meeting Five (May 2016): The final meeting was conducted via phone conferences and email exchanges per the Becker County Emergency Manager, the planning team and the participating jurisdictions. The Hazard Mitigation Steering Committee received several plan iterations. Thus, the plan approval process lasted for approximately one month (April 2016 to the May 2016), with the Becker County Emergency Manager deeming the plan approved and sending it on for state approval.

Final plan approval also consisted of a public comment and questions process. The process was advertised in the county paper of record and was available on the county and cities websites. A copy of the updated plan was available via the county website. A hard copy of the plan update was made available upon request. The review process lasted approximately 15 days.

2.1.7 Additional Meetings and Participation

As well as the five meetings, additional meetings were held with the Becker County Emergency Manager as required and or requested. These additional meetings provided the Hazard Mitigation Planning Team with additional information and insights that were vital to the plan update. Participants included officials from all of the county's jurisdictions, key stakeholders from various organizations, subject matter experts, regional and state officials, and the public.

What follows is a comprehensive list of all the meeting that occurred over the entire planning process. The dates, as well as a general synopsis of what occurred at the meetings, who participated and general notes are provided in the following table. Meetings occurred in both traditional formats and conference calls.

Table 5: Date and Purpose of Meetings

Meetings with Key Stakeholders, the Community, and Other Interested Parties			
Date	**Purpose**	**Forum**	**Invited attendees**
10/16/2013	Becker County Hazard Mitigation Plan Update Kick-Off Meeting, Community profile	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
12/5/2013	Becker County Hazard Mitigation Plan Community/Hazard Profile and Risk Assessment	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
2/25/2015	Becker County Hazard Mitigation Plan Community/Hazard Profile and Risk Assessment	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public

Meetings with Key Stakeholders, the Community, and Other Interested Parties			
Date	**Purpose**	**Forum**	**Invited attendees**
3/11/2015	Becker County Hazard Mitigation Plan Update, Risk Assessment and Mitigation Strategies	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
3/11/2015	Becker County Hazard Mitigation Plan Update and Mitigation Strategies	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
5/15/2015	Becker County Hazard Mitigation Plan Update and Mitigation Strategies	Plenary	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
4/6/2016	County Hazard Mitigation Plan Update and Create and Approve Mitigation Strategies	Plenary	Mitigation Planning Committee and city officials
May 20016	Mitigation Plan approval	Plan approval (Via Electronic review)	Mitigation Planning Committee, Mitigation Steering Committee, Participating Jurisdictions and the Public
NOTE: Each of these meetings was proceeded by extensive follow-up via electronic and other means advertised in the county paper of record meeting because of an open invitation to participate in the plan via the county outreach efforts. Becker County EM was responsible for creating this table and/or any notes and signup sheets resulting from the noted meetings.			

In addition to traditional methods of involvement, surveys were also offered to participants. These participant surveys proved to be a valuable instrument to gather data, garner local support, and ensure community participation.

2.1.8 Partners and Stakeholders

Involving partners and stakeholders in the mitigation planning process will assist in obtaining a thorough and comprehensive understanding of the county's diverse programs, facilities, operations, community vulnerabilities, hazard risks, existing and planned developments and projects, and opportunities to implement mitigation strategies. To facilitate involvement in the mitigation update, the Hazard Mitigation Steering Committee, and project team invited to participate, met with and/or used resources provided by a variety of local, regional, state, and federal authorities. Where appropriate, contacts were also made with regional, state and federal agencies and other external organizations to determine how their programs could support the mitigation efforts. The following is a list of those organizations that were used as resources invited to participate and/or is actively supporting Becker County's mitigation efforts.

Table 6: Organizations

● U.S. Geological Survey ● U.S. Army Corps of Engineers ● U.S. Department of the Interior ● National Weather Service ● Federal Emergency Management Agency ● Houston Engineering	● Becker County Sheriff's Office ● Becker County Hwy Department ● Becker County Townships Association ● Becker County Community Health ● Becker Soil and Water	● Otter Tail Power Company ● Wild Rice Electrical Power Cooperative ● Pelican River Watershed District ● Crow Wing Watershed District ● Otter Tail River	● Pine Point Public School District ● Lake Park Audubon School District ● Lake Agassiz Special Education Cooperative School District ● Frazee-Vergas Public School District

● Becker County Emergency Management	Conservation District ● Lake Region Electric Cooperative ● County Board of Commissioners	Watershed District ● Wild Rice River Watershed District ● Detroit Lakes Public School District	● Circle of Life Survival School

Note: Participation is reflected in the materials provided to support the update, actual meeting participation and or representation on the steering committee See Tables 1, 7 and Appendix C.

2.1.9 Review and Incorporation of Existing Plans and Studies

To ensure the plan was completed using best practices and included accurate information, the Hazard Mitigation Planning Team members reviewed various public domain documents to include plans, studies, and guides to begin developing the hazard mitigation plan update. These plans included, but were not limited to, mitigation plans from surrounding jurisdictions, FEMA guidance documents, emergency-services documents, contingency plans, community plans, federal, local, state regulations/ordinances, and other similar public domain documents.

The following table is a list of the public domain plans and other documents the Hazard Mitigation Planning Team used to guide the hazard mitigation plan update. Sources are also listed and cited within the document.

Table 7: Existing Plans and Studies Utilized in the Update

Existing Plans and Studies Utilized in the Update		
Plans/Studies/Guides	**Author**	**Plans/Studies/Guides and their use in creating this plan**
American Fact Finder Community Facts	US Census Bureau	This resource was used to inform the development Chapter 3, the Community Profile section of this document.
2012 Agricultural Census for Becker County	US Department of Agriculture	This resource was used to inform the development Chapter 3, the Community Profile section of this document.
Draft National Climate Assessment for Minnesota	US global Change Research Program	This document was used to inform Chapter 4, the Risk Assessment section of this document.
2013 Report of the Interagency Climate Adaptation Team report "Adapting to Climate Change in Minnesota"	Climate Adaptation Team	This document was used to inform Chapter 4, the Risk Assessment section of this document.
Drinking Water Report for Communities in Becker County	Minnesota Department of Health	This document was used to inform the Water Supply Contamination section in Chapter 4, the Risk Assessment section of this document.
2014 Minnesota Motor Vehicle Crash Facts Summary	Minnesota Department of Transportation	This document was used to inform Chapter 4, the Risk Assessment section of this document.
Fire In Minnesota Report from the State Fire Marshall for years 2007-2013	State of Minnesota Fire Marshall	This document was used to inform the structural fire section in Chapter 4, the Risk Assessment section of this document
Potential Cost Savings from the Pre-Disaster Mitigation Program	Congressional Budget Office (2007)	This document was used to inform the planning process as identified in Chapters 1,2 and 5
How-to-Guide (Series 386–1, 2, 3, 4, & 5)	FEMA	These documents were used to inform the planning process as identified in Chapters 1,2 and 5
NFIP Community Rating System	FEMA	This document was used to inform the flooding

Existing Plans and Studies Utilized in the Update		
Plans/Studies/Guides	**Author**	**Plans/Studies/Guides and their use in creating this plan**
		section in Chapter 4, the Risk Assessment section of this document.
National Flood Insurance Program	FEMA	This document was used to inform the flooding section in Chapter 4, the Risk Assessment section of this document, and define mitigation actions Section 6 of this document.
Hazus-MH: Flood Event Report for Becker County	Becker County	This document was used to inform the flooding section in Chapter 4, the Risk Assessment section of this document.
Storm Events Database	National Oceanic Atmospheric Administration	This document was used to inform Chapter 4, the Risk Assessment section of this document.
The Right-to-Know Network	Center for Effective Government	This document was used to inform the hazardous material section in Chapter 4, the Risk Assessment section of this document.
2014 Minnesota All Hazard Mitigation Plan	State of Minnesota	This document was used to inform the community profile Chapter 3 and risk assessment Chapter 4 sections.
Becker County Local Water Management Plan	Becker County	This document was used to inform community profile Chapter 3 section of this document.
Tornado History Project for Becker County, MN	Tornado History Project	This document was used to inform the Tornado section in Chapter 4, the Risk Assessment section of this document.
2008 Becker County Hazard Mitigation Plan	Becker County	This document was used to inform the community profile Chapter 3, risk assessment Chapter 4 and mitigation project Chapter 6 sections.
Texas Tech University	Wind Science & Engineering Research Center	This document was used to inform the risk assessment Chapter 4 and mitigation projects in chapter 6
2010 Becker County Land Use Analysis	Minnesota Geospatial Information Office	This document was used to inform the community profile Chapter 3.
Watershed Information	Department of Natural Resources	This document was used to inform the community profile Chapter 3 and Risk Assessment Chapter 4.
Wild Rice River, Buffalo River, the Otter Tail River and the Crow Wing Watershed Plans	Becker County	These entities were used to inform the community profile Chapter 3, Risk Assessment and Mitigation Actions.
Designation of Infested Waters and Aquatic Invasive Species Prevention Program	Department of Natural Resources	This document was used to inform the invasive species section in Chapter 4, the Risk Assessment section of this document.
Becker County Local Emergency Operations Plan	Becker County Emergency Management	This document was used to inform the Risk assessment Chapter 4 and mitigation Project section Chapter 6
Becker County Land Use/Zoning Ordinance	Becker County	This document was used to inform the mitigation Project section Chapter 6
Aquifer Withdrawal Rates	United States Geological Survey	This document was used to inform the community profile Chapter 3.
Becker County Comprehensive Zoning Plan	Becker County	This document was used to inform the community profile Chapter 3.
University of Minnesota Morris Report of the Health of Becker, Clay, Wilkin and Otter Tail Counties	University of Minnesota Morris	This document was used to inform the communicable disease section in Chapter 4, the Risk Assessment section of this document.
Becker County, Minnesota,	FEMA	This document was used to inform the flooding

Existing Plans and Studies Utilized in the Update		
Plans/Studies/Guides	**Author**	**Plans/Studies/Guides and their use in creating this plan**
Resilience Report		section in Chapter 4, the Risk Assessment section of this document.
Becker County Flood Insurance Study	FEMA	This document was used to inform the flooding section in Chapter 4, the Risk Assessment section of this document.
Becker County Soil Survey & USGA	U.S. Department of Agriculture	This document was used to inform the community profile Chapter 3.
Houston Engineering & U.S. Army Corps of Engineers	U.S. Army Corps of Engineers	Information provided be these entities was used to inform the mitigation Project section Chapter 6

2.1.10 Participation and Data Request

The success of the plan update is heavily dependent on the cooperation of the Hazard Mitigation Steering Committee, participating jurisdictions and Hazard Mitigation Planning Team. The Hazard Mitigation Planning Team created a timeline for the plan update. Additionally, the Hazard Mitigation Planning Team also created plan phases and provided direction on what would be needed to complete each phase. Plan instructions included noting who should participate, what documents should be provided to the Hazard Mitigation Planning Team for review, how to review documents and the overall planning process. This information was shared with the Hazard Mitigation Steering Committee, participating jurisdictions, and the Hazard Mitigation Planning Team. The information was regularly maintained and updated throughout the planning process.

The planning process used to complete the Becker County plan update was an iterative process; iterative, meaning as sections of the plan was prepared, the emergency manager, the Hazard Mitigation Steering Committee and participating jurisdictions reviewed the draft and provided comments and/or suggestions for improvement. The input and feedback provided were then incorporated into the draft and finalized. The following table is a representation of the planning phases used in this iterative planning process of the Becker County Mitigation Plan update.

Table 8: Participation Table (Data Request & Iterative Process Schedule)

	Information/Editing Requested by Planning Team						Information Noted as Being Validated by Jurisdictions			
This spreadsheet is a documentation of the involvement of participating Jurisdictions	October10 2013 (Community Profile)	December 5, 2013 (Capability & Risk Assessment)	February 25, 2014 (Risk & Strategies)	May 5, 2015 (Strategies & Review)	April 2016 (Review and Final Acceptance)		December 2013 (Community Profile)	February 2014 (Risk Assessment)	April 2016 (Strategies)	May 2016 (Plan Approval)
Audubon	X	X	X	X	X		X	X	X	X
Detroit Lakes	X	X	X	X	X		X	X	X	X
Frazee	X	X	X	X	X		X	X	X	X
Lake Park	X	X	X	X	X		X	X	X	X

Becker County	X	X	X	X	X		X	X	X	X

(Note: The above table does not represent actual meetings, but rather the iterative planning process. Thus, the table shows timeframes of when the Hazard Mitigation Planning Team requested data and/or feedback, when data was verified by the jurisdictions and which jurisdictions participated in the process.)

2.1.11 Summary of the Planning Process & Significant Plan Updates

The following section provides a bulleted overview of the previously described planning process and the major changes that occurred to this plan during the update. The planning update as conducted in the following phases:

- Community profile creation
- Hazard profile
  - Hazard selection
- Risk assessment conducted
  - Impact (assumptions and magnitudes)
  - Risk
  - Disaster modeling
- Mitigation strategy creation
  - Update of existing strategies
  - Creation of new strategies
  - Prioritizing strategies
- Final plan approval
  - Plan overview created
  - Plan monitoring created
  - Plan maintenance created
  - The mitigation plan was reconciled with the most current language used in planning/information/codes etc. used by the participating jurisdictions

2.2 Changes Made During this Plan Update

The update of the mitigation plan used an iterative planning process for making several changes and enhancements to the previous version of the mitigation plan. The following section provides an overview of the significant updates reflected within this plan.

- The overview of community profile sections changed to reflect the recent census data and changes within the county
- Several variables were included in the community profile that did not previously exist (See the community profile)
- The mitigation goals were updated, created and prioritized
- The hazard risk assessment was completed and updated to account for the disasters and changes within the community that occurred in the past five years
- The overview of mitigation goals, objectives and strategies were updated to reflect new goals, new objectives, and new strategies
- Processes were created to ensure governance and accountability of the plan
- A monitor and maintain section was created to ensure the plan remains updated

The following sections constitute the actual mitigation update and are a columniation of all the participants' effort. The information in each section plays an integral role in the mitigation planning process and is interdependent upon the entirety of the planning process. For assistance in using this document and/or becoming involved in future mitigating planning processes, please contact Becker County's Emergency Manager.

Section 3: Community Profile

In many jurisdictions, including Becker County, a detailed and in-depth community profile is developed as a key element of the County Hazard Mitigation Plan; however, its utility goes far beyond this plan alone. The Community Profile is an overview of the political governance, economy, geography, climate, population, community assets, future development and trends, and commercial and industrial make-up of Becker County. The Community Profile provides the county with a solid foundation for developing a common operational picture for the mitigation, but can also be referenced for other activities, such as THIRA, emergency training, exercises and actual incidents.

To complete the community profile the Emergency Manager and its representative contacted numerous agencies, conducted research and examined several technical reports and records (see the corresponding community profile section of this Plan for full details). These organizations included, but were not limited to MN State Historical Society, Becker County Social Services, Fire Departments throughout the county, Becker County Extension Service, MN Forest Service, Regional Public Health, Law enforcement, National Weather Service, United States Census Bureau, Becker County Soil and Water Conservation District, Becker County Family Services, among others.

The following pages provide a broad range of information that will serve to provide a context for the subsequent sections in this plan. This information is divided into four broad categories:

1. General Historical Overview
2. Physical Characteristics of the County
3. Population and Demographics
4. Community Conditions
5. Critical Infrastructure

This information was used in a subsequent assessment section to determine the type and magnitude of the County's risks.

The county and community profile is an important aspect of the hazard mitigation process. This profile serves to recognize and familiarize the reader with the targets of a dangerous hazard, specifically: people, property, jobs, natural resources, and crops. Through this informational process, a general picture of the make-up of Becker County can be identified.

Several documents were essential in the writing of this plan. The excerpts were written below recap these resources for the purpose of providing an idea of the general environment of Becker County.

Your Quality of Life, Your County

You do not really think about it because you do not have to. After a snowstorm the roads are cleared so you can get your kids to school safely, if there is an accident you call 911 to summons help quickly, you don't think about it because it's your county, Becker County, doing it for you. Every day in our community, county government is hard at work providing the quality of life services that makes our county an outstanding place to live and raise a family. Whether operating services or programs that keep communities safe or providing emergency services during a disaster or protecting children at risk of abuse, counties are at the foundation of what makes our state great. Take a closer look at your county and you will find that 24/7 they are there working for you.

A correctly written hazard mitigation plan will secure the life, wellness, and security of its residents, avert repetitive damages due to various hazards, and furnish a faster recovery process when a disaster does occur. In addition, there is an increased sense of cooperation and communication among the public as well as an increased possibility for funding recovery and reconstruction projects.

3.1 General Overview

Becker County is located in northwest Minnesota. The county is thirty miles north to south and forty-eight miles east to west, comprising 1,440 square miles of land. Becker County is surrounded by Norman, Mahnomen and Clearwater Counties to the north, Clay County to the west, Otter Tail County to the South and Hubbard and Wadena Counties to the east. Fargo/Moorhead, a major metropolitan area, lies thirty-five miles west. Becker County is classified as a non-metro county adjacent to a metro area with an urban population between 2,500 and 19,999 by the Economic Research Service (ERS).

3.1.1 Historical Setting

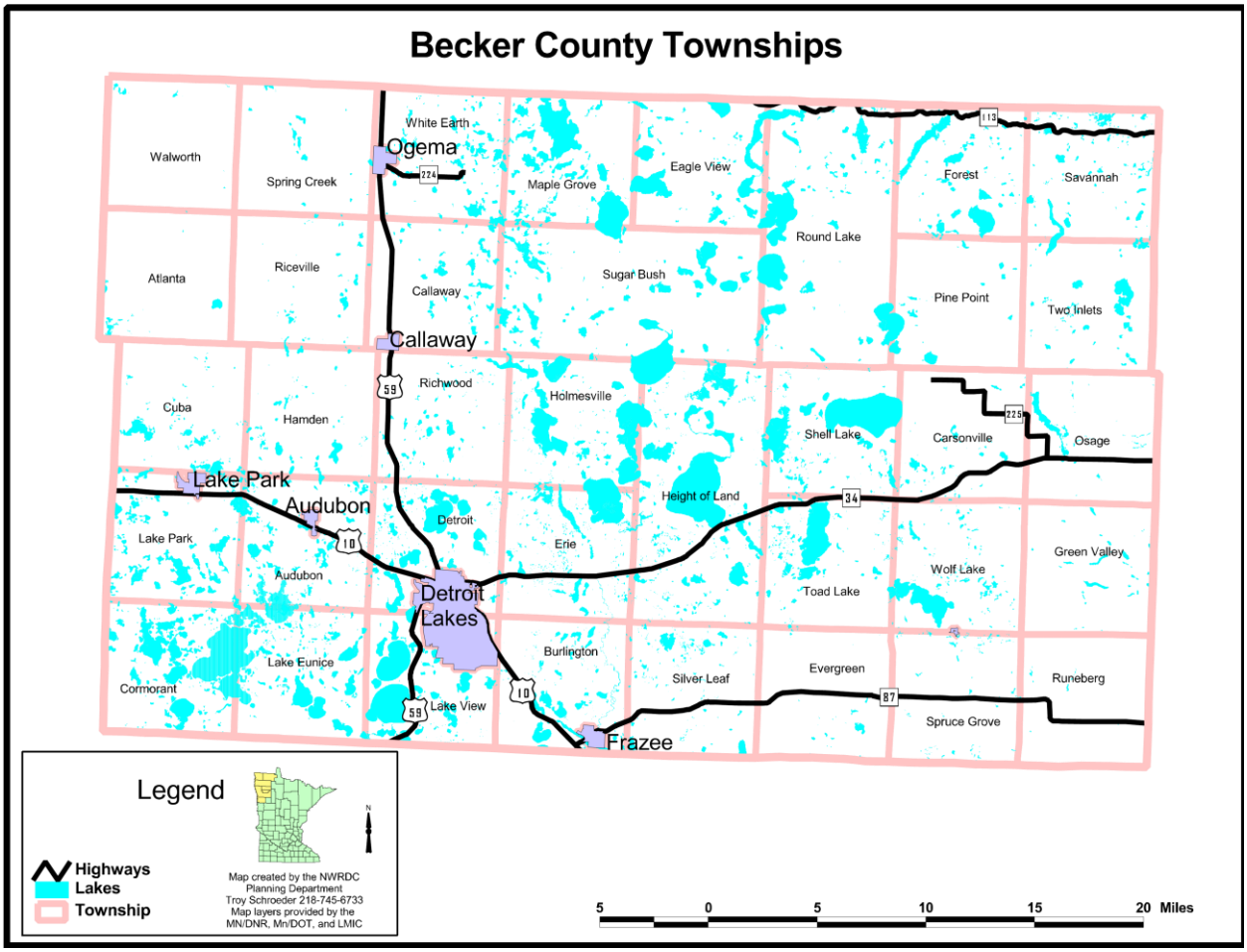
Becker County was named for Brigadier General George Loomis Becker. He was one of three members elected to Congress. Since Minnesota could only send two, Becker stayed behind in Minnesota and was promised that the county would bear his name.

The White Earth Reservation is located in portions of Becker, Clearwater, and Mahnomen Counties. Creation of the Reservation occurred in 1867 between the United States and the Mississippi Band of Chippewa Indians. The Chippewa or Ojibwa are synonymous names for the Anishinaabe, which means "the original people." This group is the largest Indian group in Minnesota.

Becker County is composed of 3 cities and a variety of other non-official communities or areas. Detroit Lakes, Frazee, Lake Park and Audubon are the only incorporated cities in the county. Unincorporated villages include Ogema, Two Inlets, Callaway, Wolf Lake, White Earth, Osage, Ponsford, and Rochert. Many other cities are listed on the roadmap of the county; these cities represent an important part of the county's past but have limited or no population.

Detroit Lakes, the county seat since 1877, is the largest city in the county. Detroit Lakes is located on the major transportation routes of US Highway 10, US Highway 59, and State Highway 34.

Figure 2: Becker County Townships



Becker County has county-wide zoning with zoning and subdivision ordinances in place, identifying seven districts: the special protection district, the residential district, the high-density residential district, the water-oriented commercial district, the commercial district, the general agriculture district and the industry district. Some townships such as Riceville and Spring Creek have more restrictive zoning in place. Most of the land is zoned in the general agriculture district.

Becker County has a shoreland ordinance as part of the zoning ordinance. This ordinance identifies three types of lakes: a natural environment lake, a recreational development lake, and a general development lake. Each type of lake has a different setback requirement and lot size. The majority of lakes in Becker County are characterized as natural environment lakes.

The cities of Detroit Lakes, Lake Park, Audubon, Frazee, Ogema, Callaway, Wolf Lake and the White Earth Reservation are all participating in the hazard mitigation process and will be represented in the plan. Unincorporated cities, while falling under the jurisdiction of the township, are still protected under this plan and by the Becker County Emergency Management process.

3.2 Climate and Precipitation

The climate of a region is determined by the monthly or longer weather pattern conditions that exist within a specified area. Minnesota experiences continental climate with four climatic seasons within a calendar year. A continental climate is characterized by the annual temperature varies due to the lack of significant bodies of water with frigid winters and hot humid summers. In northern Minnesota spring characteristically lasts from early March to early May with an average temperature of 36 degrees Fahrenheit. Summer lasts from late May to late August with an average temperature of 60 degrees Fahrenheit; with the highest record temperature of 114 degrees Fahrenheit in July of 1936 in the city of Moorhead. Fall lasts from mid-September to mid-November with an average temperature of 38 degrees Fahrenheit. Winter lasts from early December to late February with an average temperature of 6 degrees Fahrenheit; with the lowest record temperature of -60 degrees Fahrenheit in February 1996 in the city of Tower. The northern regions experience an average of 31 inches of precipitation each year; with an average 19 inches of rainfall and in the spring and summer seasons and an average 70 inches of snowfall in the fall and winter seasons; with a record season snowfall of 175 inches in 1949-1950 near the city of Grand Portage. Characteristically Minnesota experiences two blizzards annually within each winter season with a record maximum of 36 inches in January 1994 near the city of Finland. The northern regions of the Minnesota experience slight variations in climatic conditions than it's southern counterparts.

3.2.1 Climate

The climate of the County is characterized as continental. During the winter months, cold, dry polar air dominates the region. Hot, dry air masses from the desert southwest, along with warm, moist maritime tropical air masses that originate over the Gulf of Mexico, are common during the summer months. The spring and fall months serve as transition periods between the summer and winter, with alternating intrusions of air from various sources.

As shown in, Figure 3, the average daily temperature for the County is between 42 and 44 degrees F. The 40- year (1971-2010) average annual temperature for Becker County was 42.8 degrees F. The temperature extremes for this station are provided in Table 9.

The maximum one-day temperature ever recorded was 107 degrees F; this occurred in 1936. The lowest one-day temperature ever recorded was in 1996 at -51 degrees F.

Figure 3: Average Daily Temperatures

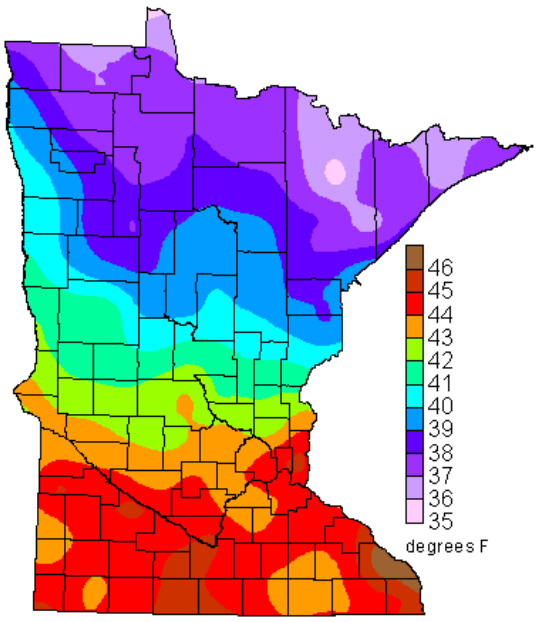


Table 9: Temperature Extremes for Becker County (1896-2010)

City	Temperature in degrees (F)			
	Record High	Year	Record Low	Year
Ogema	103	1976	-48	1996
Callaway	107	1936	-46	1936
Richwood	107	1936	-46	1936
Lake Park	105	1984	-40	1984
Audubon	107	1936	-46	1936
Detroit Lakes	107	1936	-46	1936
Frazee	107	1936	-46	1936
Wolf Lake	101	1976	-51	1996
Osage	101	1976	-51	1996

3.2.2 Precipitation

Figure 4: Average Annual Precipitation

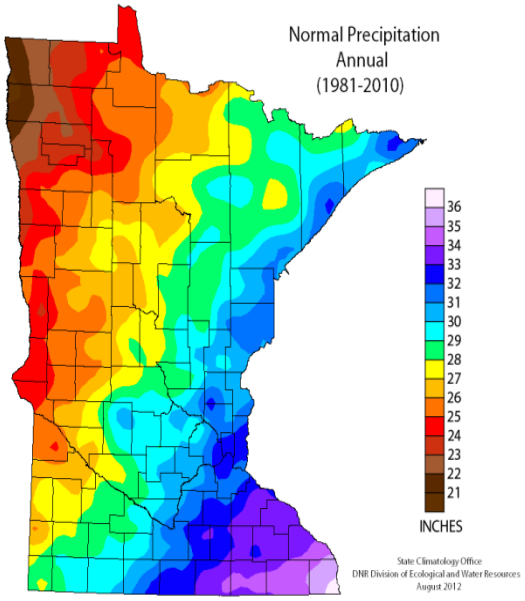


Figure 4 displays the State's average annual precipitation (1981-2010), as determined by the Minnesota Climatology Working Group. Becker County averages 27-31 inches of precipitation annually. On average this includes 19 inches of rain from May to September and 47 inches of snowfall. The precipitation extremes are presented in Table 10. The maximum one-day precipitation was 7.20 inches; this occurred on June 9, 1895. Annual snowfall for the County is approximately 47 inches; however, this represents only a small portion of the annual precipitation due to the low moisture content of snow. Even so, minor flooding can occur in the spring as a result of a number of factors including a deep, late winter snowpack, frozen soil prohibiting the infiltration of water, and rapid snow melt due to an intrusion of warm air and precipitation.

Table 10: Precipitation Averages for Becker County (1893-2010)

Month	Average in.
January	0.75 to 1.00
February	0.50 to 0.75
March	1.00 to 1.50
April	1.25 to 2.00
May	2.50 to 3.25
June	3.50 to 4.50
July	3.25 to 4.00
August	2.75 to 3.50
September	2.00 to 2.75
October	1.75 to 2.75
November	1.00 to 1.50
December	0.50 to 1.00

3.2.3 Geology

The state's geology is influced/defined by three specific periods; the formation of Precambrian rock, the formation of Sedimentary rock, and the Ice Ages.

Precambrian

Minnesota's oldest rock formations date back to 2,700 million years. The Precambrian bedrock varies in age from Achaean (approximately 2,700 million years) to Paleoproterozoic (approximately 2,200 to 1,800 million years). Minnesota's oldest rocks, the Lower Precambrian gneiss rocks, lie in alternating belts within the northern half of the state and much of the Minnesota River Valley. The granitic gneiss rock is formed when granite and other rocks were subjected to intense heat and pressure within the earth crust from magma flows, causing a chemical and structural change, to form large crystals. Gneiss rocks also underline portions of the Minnesota River Valley dating back 3,600 million years. Volcanic rocks began their formation 2,700 million years ago when lava escaped the earth crust through rifts in the sea floor. These volcanic formations are found throughout Minnesota's portion of the Canadian Shield, from the northern half of the state to the Minnesota River Valley. The volcanic debris, sand, mud, and gravel released into the nearby waters settled to form layers of sedimentary rock. The Achaean rocks are volcanic rocks that metamorphosed into greenstone that underlie portions of the terrain that are well exposed in the northeastern regions Minnesota. Tectonic activity folded many of these rock formations forming faults, or slippage planes. During this period of tectonic activity, the Panokean Mountains formed, extending from east-central Minnesota through northern Wisconsin and Michigan. From the folds occurring during this period, the Thomson formation was created southwest of Duluth. Finally, a collision of crustal plates

produced the Great Lakes Tectonic Zone, extending across the state from Morris and Alexandria toward Duluth.

Sedimentary

The tectonic events left areas of high relief above the low basin of the Midcontinent rift. Over the next 1,100 million years, the uplands were worn down and the rift filled with sediments, forming rock ranging in thickness from several hundred meters near Lake Superior to thousands of meters further south. Approximately 550 million years ago, the state went through cycles of repeated undulation with waters from the shallow sea. The land mass of what is now North America ran along the equator, and Minnesota had a tropical climate. Sedimentary rocks from the Cretaceous age were deposited roughly 65 to 100 million years ago over a broad area of Minnesota that extended as far north as the western end of the Mesabi Iron Range. Subsequent erosion has removed most of these strata, leaving only scattered outliers throughout the region. The Cretaceous rocks were deposited on top of weathered Precambrian bedrock.

Ice Age

The State of Minnesota has been through several Ice Ages, glacial advance, dating back to two million years ago during the Quaternary Period. The most recent glacial advance was the Wisconsin Glaciation that spanned approximately 100,000 to 10,000 years ago. This glaciation drastically remodeled most of Minnesota, by lobes of glacial ice pushed in different directions across the landscape. There were three distinctive lopes, the Wadena Lope, the Rainy and Superior Lobes, and Des Moines Lobe, that created the current surface features of the state. The Wadena Lope advanced from the north several times across Minnesota's landscape with the last advance creating the Alexandria moraine, the Itasca moraine, and the drumlin fields spanning Otter Tail, Wadena, and Todd counties. The Rainy and Superior Lobes advanced several times from the northeast with its last advanced leaving rock formations of basalts, gabbro, granite, iron formation, red sandstone, slate, and greenstone from the northeastern half of Minnesota to the Twin Cities. The Des Moines Lobe advanced from the northwest across Minnesota and into Iowa leaving rock formations of limestone, shale, and granite fragments, which developed into the prairie soils found in the region. Southern regions of the state were untouched by the last ice age leaving driftless area, where land was not advanced by the glacial till or drift. The landscape features more bedrock exposures, the rivers and streams are more developed, resulting in more efficient drainage systems and advanced erosion.

3.2.4 Hydrology

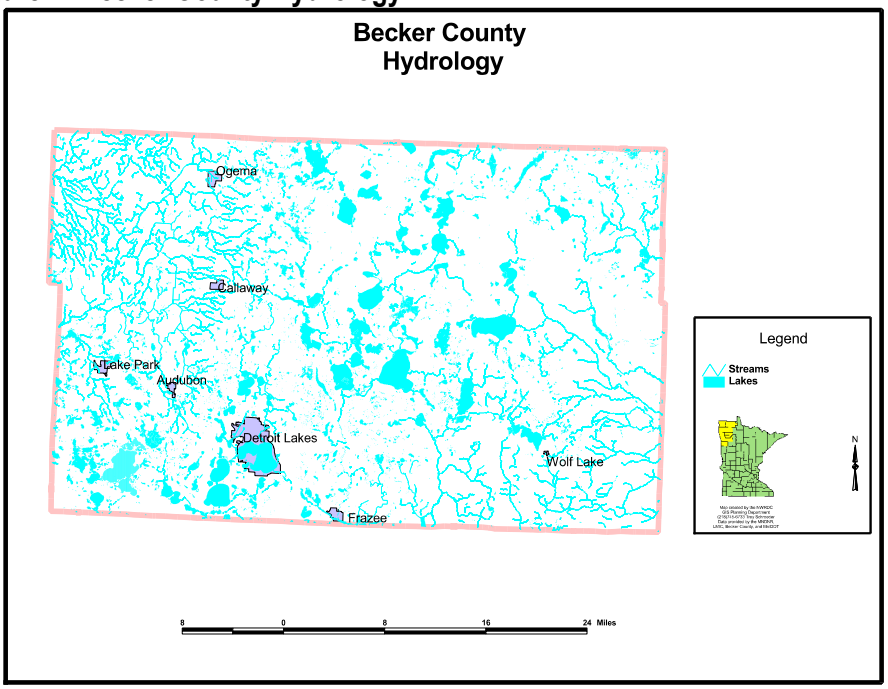
The hydrology of Minnesota is a system of groundwater (aquifers), lakes, watersheds, wetlands, and a network of rivers and streams. Aquifers are areas of rock below the ground surface that can produce sufficient amounts of water to efficiently supply the communities within the region. There are three different types of aquifers:

1) Unconfined, is where the water table is able to move freely without interference due to the lack of aquitard, a non-permeable formation.
2) Semi-confined, is where the water table is partially confined due to semi-permeable formations, and,
3) Confined, is where the water table is completely confined by non-permeable formations above and below the body of water. The amount of groundwater available is dependent on the amount of precipitation the region receives each year. Minnesota's ground water system supplies approximately 75 percent of the state's drinking water and approximately 90 percent of the agricultural irrigation. Minnesota's ground water system is comprised of a system of six provinces of different aquifers; the Cambrian-Ordovician Aquifer system, Lower Cretaceous Aquifers, Paleozoic Aquifers, Sand and Gravel Aquifers, and the Upper Carbonate Aquifer. The provinces include the Metro Province, the South-Central Province, the Southeastern Province, the Central Province, the Western Province, and the Arrowhead Province.

A watershed is a physical area where water from streams, rivers, lakes, and wetlands drain into the surrounding land. Minnesota has 8 water basins, 81 major watersheds, and 5,600 minor watersheds. Minnesota also has 11,842 lakes (over 10 acres), 6,964 rivers and streams (69, 200 miles), 9.3 million acres of wetlands, and borders Lake Superior, which is the world's largest freshwater body.

The hydrology of Becker County is a very important, northwest Minnesota is one of the most drained areas in the United States, if not the world. Water issues and flooding present a challenge to someone every year. It is important to document what the hydrology of the county is as a first step to try and mitigate flooding.

Figure 4: Becker County Hydrology



3.2.5 Groundwater

Becker County is characterized by glacial drift overlying Cretaceous bedrock, usually clay rich and thick. Sand aquifers found in the glacial drift are rich in sand as well as clay. An aquifer is any rock formation that can be used to store or transmit water. It is usually a porous material such as sandstone or gravel that is confined by a less porous material. It is not depicted as a void beneath the ground. There are also aquifers that are found between interbedded layers of sandstone and thick shale. Becker County has a very high-quality groundwater system that includes both surficial and buried drift aquifers. A comprehensive local water plan has been written to ensure that the quality remains high. Water testing clinics have been carried out in all portions of the county. Areas of concern are noted such as abandoned wells and problem septic systems.

Surficial aquifers are shallow aquifers typically less than 50 feet (15 m) thick, but larger surficial aquifers of about 60 feet (18 m) have been mapped. In Becker County, the depth to bedrock is 100 feet at a minimum. Buried sand and gravel aquifers are very apt to exist. These can occur from ice deposits (moraines) or water deposits (outwash, lake sand, kames, and eskers). In some cases, water will move down to recharge bedrock aquifers, or move from bedrock aquifers up to the surficial aquifers for discharge into a nearby stream or river. Wells often take water from this type of aquifer.

Crystalline-rock aquifers are one of the most common in Becker County. Precambrian rocks are the main constituents of the crystalline rock aquifers. Granite, gabbro, gneiss, schist and slate are all common lithologies. Water collects by following faults, joints and fractures within the rock. The quality of the water collected is broad, ranging from salty to fresh.

The Cretaceous aquifer can be seen in a small region of Becker County. This aquifer is not one of the most common in the area. It is defined by sandstone beds, ranging from thick to thin, overlain by beds of limestone or shale. The limestone and shale have a confining property upon the aquifer. The Cretaceous aquifer is also overlain by glacial deposits. Overall, the total thickness drifts from ninety feet to about 170, depending on the area. Water from this aquifer tends to contain concentrations of dissolved solids.

Table 11: Aquifer Withdrawal Rates

County	Glacial/Surficial Aquifer	Other Aquifers
Becker	6.52	0.71
Kittson	0.6	0.56
Marshall	0.31	0.28
Norman	0.22	0.18
Pennington	0.06	0.02
Polk	0.67	0.48
Red Lake	0.87	0.15
Roseau	0.66	0.25

Figures are MG/D (million gallons per day) Source: United States Geological Survey

The Department of Natural Resources Water Year Data Summary Report document that Becker County used about 3,184.7 million gallons of water in the year 2001. Surface water accounted for 34.1 million gallons and the rest was ground water. Crop irrigation was the primary use of water in Becker County. Usage had risen from 2000 when 2,772.3 million gallons of water were used.

Although not a problem now, concerns have been raised in regard to water levels and increased irrigation. Studies are being done currently.

3.2.6 Lakes

According to the Minnesota Department of Natural Resources, there are two hundred and thirty-six lakes in Becker County. The United States Geological Survey's GNIS system (Geographic Names Information System) lists 374 lakes. Alvin H. Wilcox lists two hundred and ninety-six in his book, "A Pioneer History of Becker County, Minnesota." Varying numbers on the exact amount of lakes in Becker County are most likely due to the differing definitions of a lake and how many acres a body of water must hold in order to be considered a lake instead of a pond or other smaller body of water. Lakes in Minnesota have a typical fluctuation of about one to two feet per year but historical information suggests that over ten feet of difference have been seen. To see the DNR's list of lakes please go to the Lake Finder feature on their website: http://www.dnr.state.mn.us/lakefind/index.html A sample of the information that is included on this website includes various descriptions, ownership, type, area, depth, clarity, fish stocking and various maps available for download. The Minnesota Pollution Control Agency (MPCA) also has a lake assessment section with similar information.

Lakes in Becker County have come under increased pressure from mounting development. A population and housing development boost around lakes have caused a decrease in water quality. A recent rising trend of shoreline development combined with the decrease of shoreline management practices has local agencies worried. Lake water clarity is less and more algae problems are being seen as indicators of lake deterioration. Practices contributing to the problem include removing shoreline vegetation, lawn fertilizer leaching into the lake, runoff from storm sewers, agricultural lands and the increase in impermeable surfaces, and wetland drainage.

3.2.7 Rivers

The two main rivers in Becker County are the Red River and the Mississippi River. The following quote is from Alfred H. Wilcox in his book: A Pioneer History of Becker County. The following paragraph describes the relationship these two rivers have with each other and with Becker County.

"Becker County occupies a peculiar position in the physical geography of our country, located as it is on the watershed of North America. We are living at the fountain head. Our county is at the beginning and the parting of two mighty rivers. Around us rise the fountains from which the great Mississippi begins its course to the Gulf of Mexico, and from which the Red River of the North pursues its winding way to the Arctic Sea. A peculiarity of these rivers is that they both start on their long journey to the sea in a direction exactly opposite to their general course and final destination."

A continental divide that runs through Becker County contributes to the situation noted in the above paragraph. The eastern third of the county contributes to the Mississippi River basin while the central, west and southern portions of the county contribute to the Red River basin.

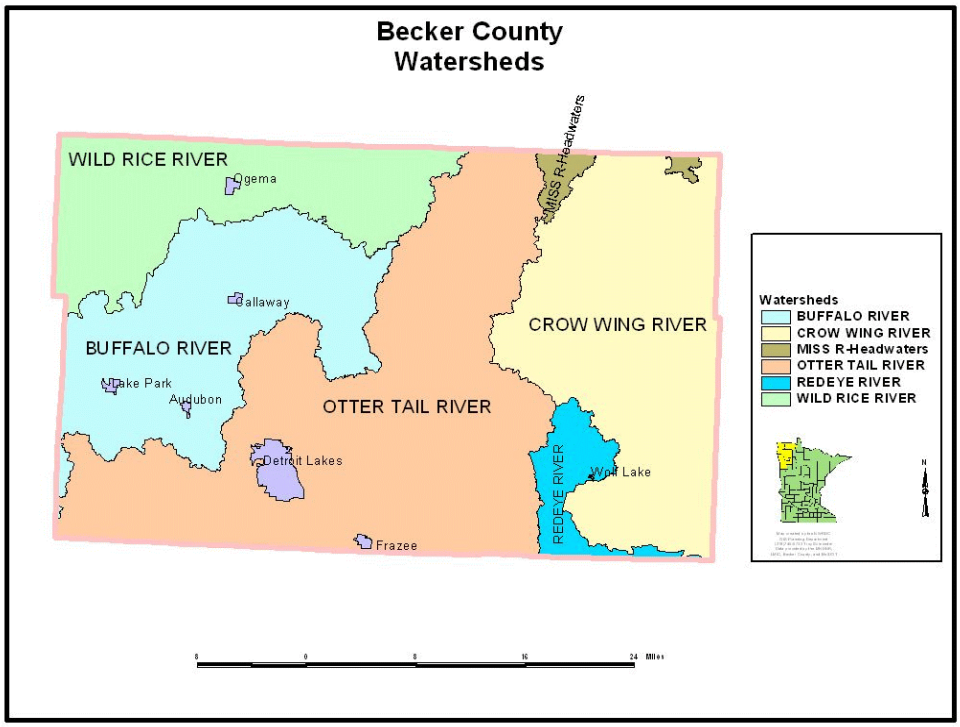
Other rivers in Becker County also have their headwaters located within. The South Branch of the Wild Rice River begins near Ogema and winds in a westward direction toward the Red River. The Buffalo River has its headwaters located just northeast of Callaway as it meanders westward towards the Red River. The Otter Tail River starts in Becker County and eventually meets the Red River. The Mississippi River in Becker County is fed by two major watersheds: The Crow Wing and the Redeye. In all, rivers, streams, and swamps make up about fourteen percent of land in Becker County (Albert Wilcox). This percentage can be described as the land that does not have good drainage due to surrounding topography.

Humans have affected rivers since their settlement in the area in various ways such as sedimentation, dikes, levees, and draining areas. Human activity can also leads to flooding. Flooding information will be covered in greater detail later in this report in the hazard identification section. The hydrology map above and the watershed map below give more information about the rivers that flow through Becker County.

3.2.8 Watersheds

Minnesota has forty-six watershed districts. Water-related problems are solved and prevented by these units. There are four watersheds that occur in Becker County: the Pelican River Watershed District, the Wild Rice Watershed District, the Buffalo-Red Watershed District and the Cormorant Watershed District. The boundaries of a watershed differ from the political boundaries of a county in that the watershed boundary is dependent upon the local bodies of water. A water-related event such as a flood knows no boundaries, so it is important to manage water and practice mitigation and conservation on a watershed basis.

Figure 5: Becker County Watersheds



3.2.9 Wetlands

Wetlands serve an important function in the region. They are integral in their usage as wildlife habitats. Many wetlands serve both as nesting grounds and as stops for migrating birds. Wetlands are also valued because they slow down surface water runoff. The dense plant growth can store vast quantities of water, which helps in flood control or in times of immense precipitation or snow melt. The sediments that are found in wetlands can also be used as a natural filter for pollutants. There are eight types of wetlands found in Minnesota.

- Type one (seasonally flooded basin) wetlands are often found in upland depressions or forests that are found in the floodplain. Looks can be deceiving as this swamp only floods during certain seasonal periods, leaving it well-drained other times of the year. Vegetation varies greatly depending on the continuity and time of the flood. Varieties of herbaceous plants to hardwood trees can be seen.

- Type two (wet meadow) wetlands are often found in shallow basins or sloughs. The soil is waterlogged a few inches below the surface. Grasses, rushes, sedges, and various broadleaf plants inhabit this type of wetland.

- Type three (shallow marsh) wetlands are found in shallow lake basins or sloughs. The soil is waterlogged and is covered by six inches of water or more. Grass, rushes, cattails, arrowheads, smartweed, and pickerelweed are often found populating this wetland.

- Type four (deep marsh) wetlands are found in depressions like shallow lake basins, potholes, and sloughs. Six inches to three feet of water often covers the soil. Cattails, rushes, reeds, and wild rice are found here, as well as pondweeds, nalads, coontail, watermilfoils, waterweeds, duckweeds, and water lilies.

- Type five (shallow open water) wetlands are found in shallow lake basins. Water less than ten feet deep covers the surface of the soil. The vegetation here is similar to the vegetation in Type 4 wetlands.

- Type six (shrub swamp) wetlands are located along slow streams, drainage depressions, and flood plains. Water up to six inches covers the ground. This is because the water table is located at or near the surface. Vegetation residing here includes alders, willows, dogwoods, buttonbrush, and swamp privet.

- Type seven (wooded swamp) wetlands are found in ancient shallow lake basins, oxbows, slow streams, and on flat uplands. Up to one foot of water covers the ground. This is because the water table is located at or near the surface. Hardwood and coniferous vegetation such as black spruce, tamarack, balsam, red maple, and black ash are found residing in these swamps, as well as deciduous duckweed and smartweed.

- Type eight (bog) wetlands are found in shallow glacial lake basins and depressions, flat uplands, and slow streams. The soil is usually waterlogged because the water table is at or near the surface. Woody and herbaceous varieties of vegetation grow here, as well as moss.

The following graph lists the acreage of each type of wetland in a given county:

Table 12: Acreage of Wetlands

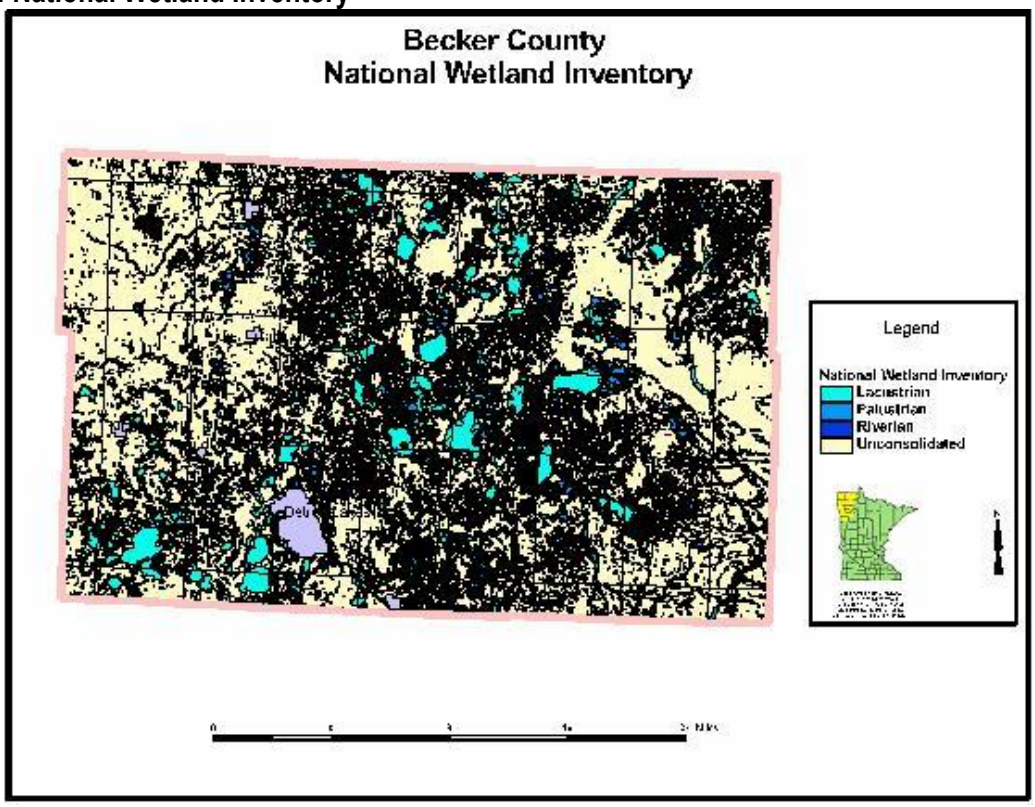
County	T1	T2	T3	T4	T5	T6	T7	T8
Becker	2,207	10,564	60,004	3,642	13,701	26,904	8,304	23,026
Kittson	2,938	42,356	5,112	827	193	17,505	2,290	211
Marshall	5,319	52,328	41,201	5,244	2,596	56,192	22,985	8,446
Norman	2,275	4,032	6,857	217	0	1,921	2,932	216
Pennington	1,726	15,299	3,778	76	0	6,059	1,861	276
Polk	3,763	27,237	26,617	440	2,462	14,800	7,228	1,437
Red Lake	1,187	5,106	2,156	65	0	2,202	1,903	259
Roseau	8,235	119,160	4,149	2,815	1,682	110,511	69,323	49,251

Source: Minnesota Department of Natural Resources

The National Wetlands Inventory maps wetland vegetation types and boundaries using high altitude aerial photography.

- A Lacustrian environment is a wetland with lakes and deep ponds.
- A Riverian environment is a wetland with a river, creek, or stream.
- A Palustrian environment is a wetland with a shallow pond, marsh, swamp or slough. Woody vegetation can sometimes be seen.

Figure 6: National Wetland Inventory



3.2.10 Ecology

The ecology of Minnesota is a relationship between organisms and their environments. With the combination of Minnesota's geology, hydrology, and climate the state's ecology is broken down into a classification system, by Minnesota Department of Natural Resources of Provinces, Sections, Subsections, Land Type Associations, Land Types, and Land Type Phases.

Table 13: Ecology

Minnesota Ecology	
Classification	**Criteria**
Provinces	Provinces are units of land defined using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. There are 4 Provinces in Minnesota.
Sections	Sections are units within Provinces that are defined by the origin of glacial deposits, regional elevation, distribution of plants, and regional climate. Minnesota has 10 sections.

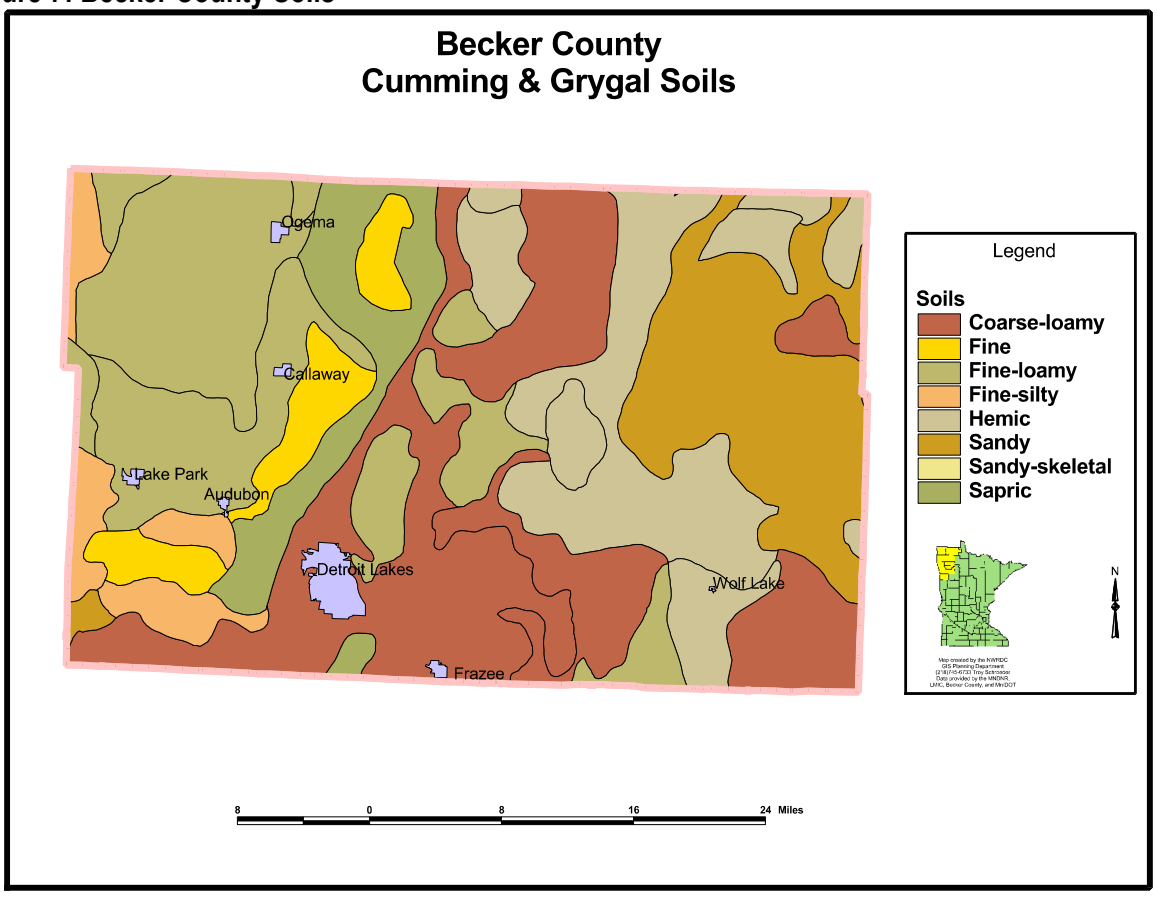
Subsections	Subsections are units within Sections that are defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. Minnesota has 26 subsections.
Land Type Associations	Land Type Associations are units within Subsections that are defined using glacial landforms, bedrock types, topographic roughness, lake and stream distributions, wetland patterns, depth to ground water table, soil parent material, and pre-European settlement vegetation. Minnesota has 291 land type associations.
Land Types	Land Types are units within Land Type Associations that are defined using pre-European settlement vegetation, historic disturbance regime, associations of native plant communities, wetland distribution, and soil types.
Land Type Phases	Land Type Phases are units within Land Types that are defined using a native plant community class, soil type, and topography.

3.2.11 Soil

As an agricultural county, soil is one of Becker County's most valuable resources. Soil develops from the breakdown of rock minerals, intermixed with plant and animal remains. The formation of a soil is an extremely long process, taking place over hundreds of thousands of years. Becker County's soils were formed from deposits originally left by glaciers more than 10,000 years ago. The County has a wide variety of soil types due to the wide variety of parent material from which they were formed. Climate, vegetation, and topography are also important in the formation of the County's soils.

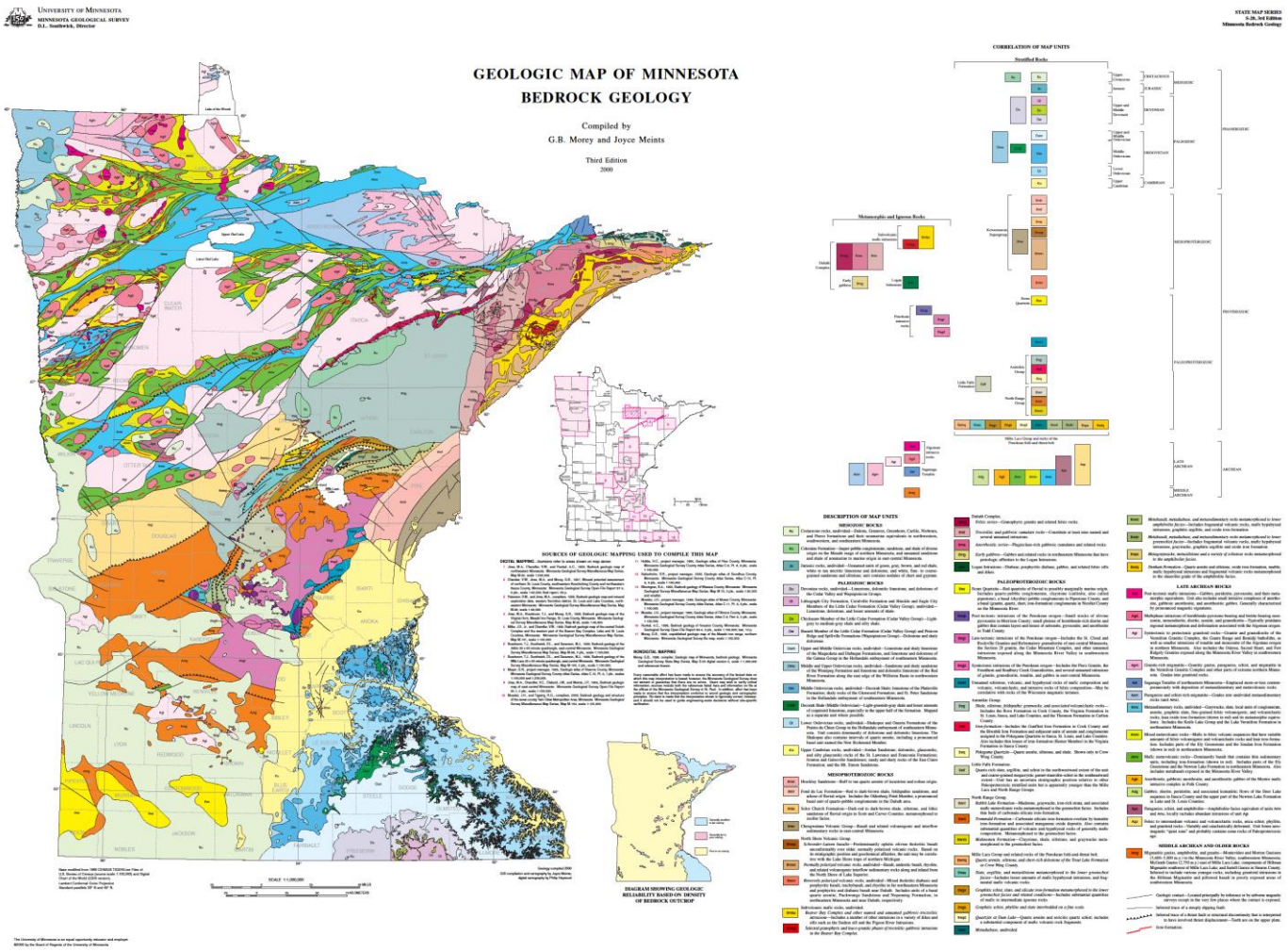
A brief description of Becker County's association are provided below:

Figure 7: Becker County Soils



The bedrock of Becker County greatly varies. It is made up of a variety of rocks and minerals instead of one homologous type. Faults can also be seen crossing the bedrock. There is one particular thrust fault that is of interest due to the fact that it differs from the other faults seen in the county. The map can be seen in the following figure:

Figure 8: Bedrock Geology



Becker County shows different size bands of bedrock having the same orientation. This trend is a southwest-northeast direction. Three bedrock types display this banding trend. They are all formed in the late Archean.

1. Metavolcanic Type Bedrock: Variable quantities of felsic volcanogenic and volcaniclastic rocks can be found composing this type, as well as iron. This type is often described in a number of volcanic sequences varying from mafic to felsic.

2. Mafic Metavolcanic Type Bedrock: Concentrations of iron formations are almost always found scattered throughout the basalt, as well as thin sedimentary units.

3. Metasedimentary Type Bedrock: It is composed of shale, graywacke, slate, arenite as well as volcaniclastic and volcanogenic rocks. Conglomerate can also be viewed.

There are also concentrations of bedrock found in spots across Becker County that do not band.

1. The first type is made up of granodiorite, syenite, diorite, and a monzonite that can be rich in hornblende, pyroxene or biotite. This type was formed in the late Archean.

2. The second type was formed in the Mesozoic. This is made up of rocks from the Dakota, Graneros, Greenhorn, Carlile, Niobrara and Pierre formations.

In order for soils to form, five different constituents must be present: parent material, climate, relief, organisms, and time. A unique mixture of the five above factors will result in the formation of a soil. The soil that is seen on the landscape of Becker County is not a random occurrence, but the careful combination of the above factors. The following soil associations are seen in Becker County:

Table 14: Soil Associations in Becker County

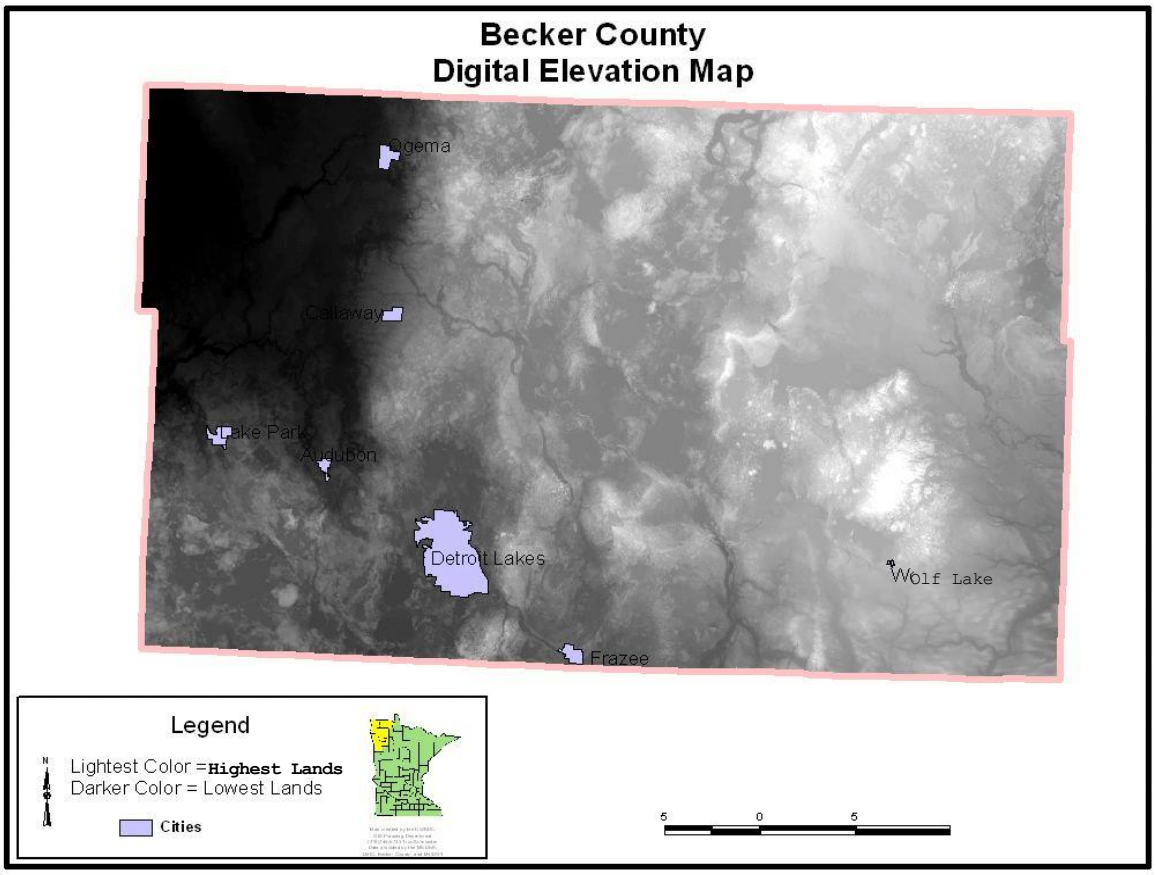
Soil Associations in Becker County
Hamerly-Winger-Valleys
-Formdale-Langhie-Lom
-Barnes-Langhie-Vallers
-Waukon-Forman-Cathro
-Nebish-Seeleyville
-Birchlake-Audubon-Foxlake
-Naytahwaush-Seeleyville
-Sugarbush-Graycalm-Two Inlets
-Blowers-Paddock-Rockwood
-Snellman-Rifle-Sugarbush
-Sol-Lumpton-Sugarbush
-Eagleview-Seeleyville-Snellman
-Arvilla-Sandberg
-Verndale-Dorset-Corliss

Reference: United States Department of Agriculture, Soil Survey of Becker County, Minnesota

3.2.12 Topography

The highest elevation in Becker County is located in the southeast part of Wolf Lake Township at 1,850 feet. The lowest elevation is estimated to be near 1,150 feet and is found in the northwest part of Walworth Township.

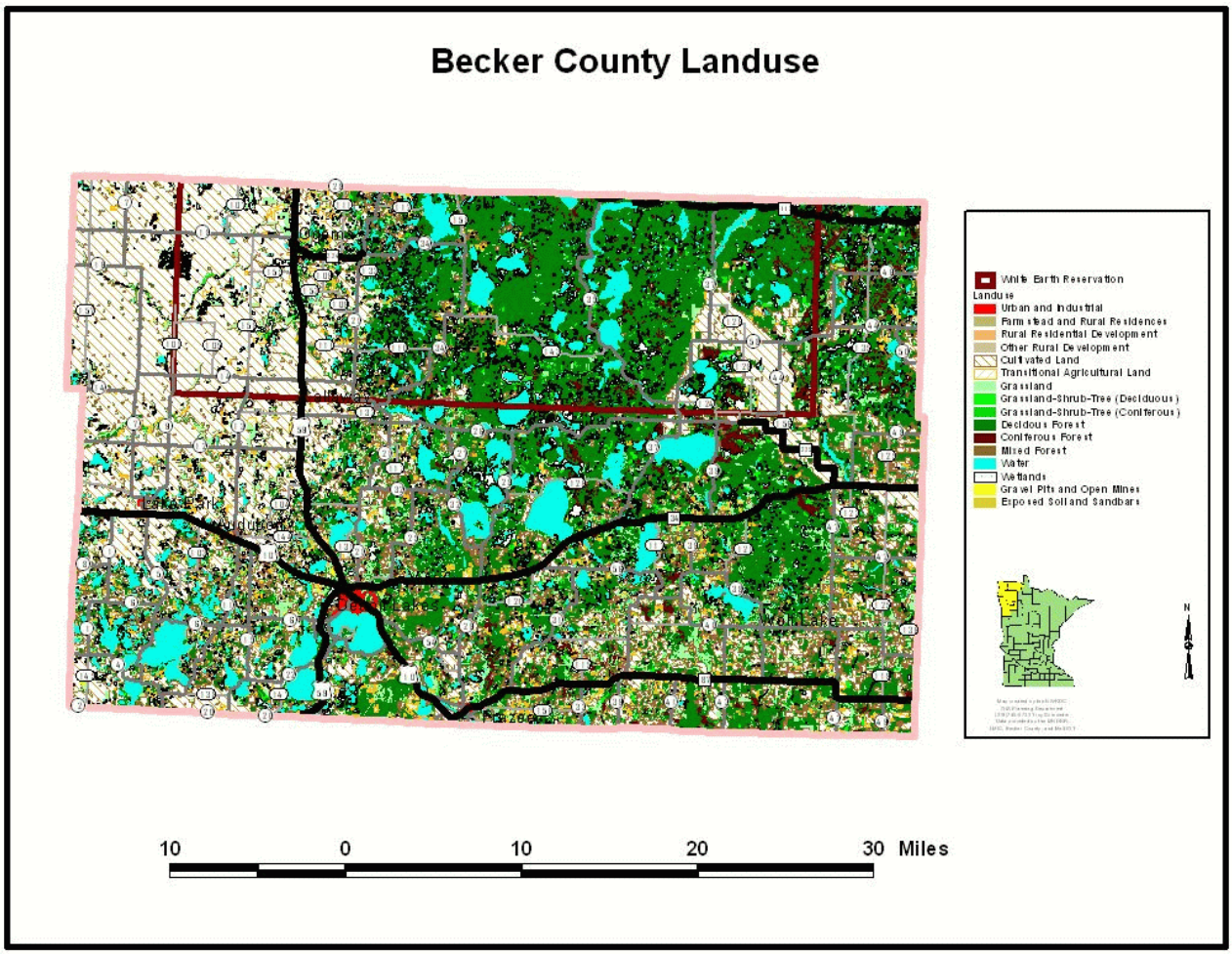
Figure 9: Becker County Topography



3.2.13 Land Use

The University of Minnesota, Remote Sensing, and Geospatial Analysis Laboratory developed the *Minnesota 2000 Level 1 Landsat Landcover Classification*, which offers the most recent land use data for the County. The land cover type was derived via mulitemporal, multispectral supervised image classification of satellite imagery acquired by the Landsat TM and Landsat ETM+ satellites. A seven-category classification scheme was developed to categorize data. The following describes the types of land uses found in each category.

Figure 10: Becker County Land Use



- ***Agriculture*** - An area where the primary cover type during the growing season is an agricultural cover type, including row crops, forage crops, and small grains. Examples: corn, soybeans, alfalfa, oats, wheat, and barley.

- ***Forest*** - An upland area of land covered with woody perennial plants, the tree reaching a mature height of at least 6 feet tall with a definite crown. Examples: white pine, red pine, oak, mixed conifer, and mixed deciduous.

- ***Grassland*** - An upland area covered by cultivated or non-cultivated herbaceous vegetation predominated by grasses, grass-like plants, and forbs. Includes non-agricultural upland vegetation dominated by short manicured grasses and forbs, as well as non-cultivated herbaceous upland vegetation dominated by native grasses and forbs. Examples: golf courses, lawns, athletic fields, dry prairies, and pastures.

- ***Shrubland*** - An upland or lowland area with vegetation that has a persistent woody stem, generally with several basal shoots, low growth of fewer than 20 feet in height. Examples: alder, willow, buckthorn, hazel, sumac, and scrub oak.

- ***Urban/Developed*** - An area containing any amount of impervious cover of man-made solid materials or compacted soils, including areas with interspersed vegetation. Examples: parking lots, shopping malls, warehouses, industrial parks, highways, sparse development, single family residential developments, single lane roads, and mines.

- ***Water*** - An area of open water with none or very little above surface vegetation. Examples: lakes, streams, rivers, and open wetlands.

- ***Wetland*** - A lowland area with a cover of persistent and non-persistent herbaceous plants standing above the surface of wet soil or water. Examples: cattails, marsh grass, sedges, and peat.

According to Table 15, agricultural land is the predominant land use in the County, comprising more than half of its area (60.9%). Other major land uses include Forest (9.6%), Wetland (9.3%), Urban/Developed (7.6%), and Water (7.0%). Relatively minor land uses include Grassland (5.0%) and Shrubland (0.5%).

Table 15: Becker County Land Use Analysis (2010)

Land Use	Area (ac)	County (%)
Agriculture	336,178	60.9
Forest	52,788	9.6
Wetland	51,559	9.3
Urban/Developed	42,071	7.6
Water	38,875	7.0
Grassland	27,526	5.0
Shrubland	2,822	0.5
Total	**551,819**	**100.0**

3.2.14 Public Land Ownership

The majority of land in the County is privately owned. Based on available data from local, State, and Federal agencies, public land accounts for only 2.5% of the area of the County. Table 16 presents an inventory of the major public lands. The U.S. Fish and Wildlife Service (5,620 ac) and DNR, Division of Fish and Wildlife (3,579 acres) manage the most public land. It is important to note that these figures do not account for land that is enrolled in conservation easement programs, such the Conservation Reserve Program and Reinvest in Minnesota.

3.2.15 Presettlement Vegetation

The DNR has inventoried the original vegetation of the State through its Presettlement Vegetation Database. Pre-settlement vegetation was determined by analyzing the detailed maps and records of early surveyors (circa 1895). The purpose of this database was to enable analysis of pre-settlement vegetation patterns for determining natural community potential and patterns of disturbance. Prior to European settlement of the area, the vegetation in the western half of the county was mainly tall prairie grass species, wetland reeds, and sedges and that in the eastern half was mainly mixed hardwoods.

Table 16: Becker County Public Lands Inventory

Public Agency	Number of Tracts	Area (a)
U.S. Fish and Wildlife Service	33	5,620
DNR, Division of Fish and Wildlife	21	3,579
DNR, Division of Parks and	12	2,115
Bureau of Land Management	15	1,112
Department of Transportation	10	591
Becker County	8	575
DNR, Division of Forestry	4	199
DNR, Division of Minerals and	1	79
Department of Corrections	1	40
DNR, Division of Trails and	1	39
Total	106	13,949

3.3 Population and Demographics

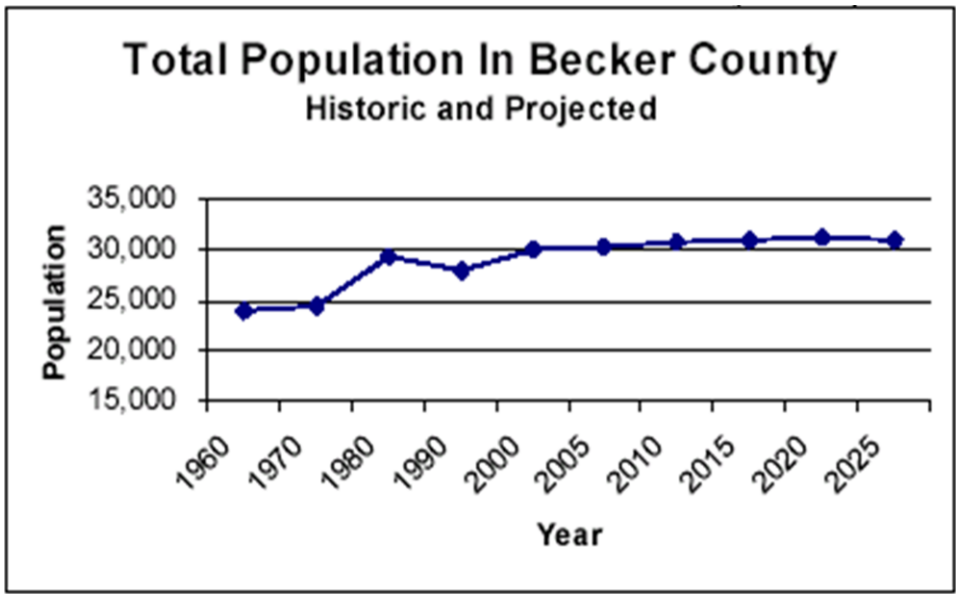
3.3.1 Historic Population

Becker County's population data since 1960 is presented in Figure 3. Notice that the County gained residents every decade except the 1990s during the time period. Since 1990, the County has experienced steady growth. This trend is expected to continue into the future.

3.3.2 Cities and Township Populations

In the past decade, Becker County has seen a shift of population. The lakeside communities have seen the greatest growth which coincides with an increased shift towards lakes as a primary entertainment venue in the region. With lake homes expanding, there becomes an increased need for services provided by both the public and private sectors. As expressed in some of the following graphs, the county's average age is increasing. The next generation of retirees is leaving the rural farming communities and moving to heavier populated areas to increase the availability of services.

Figure 11: Population of Becker County since 1960 (U.S. Census)



Source: Becker County Comprehensive Zoning Plan

Table 17 presents population data for Becker County's cities and townships since 1990. As previously mentioned, Detroit Lakes is the County's largest city, with a 2010 population of 8,509. Overall, the total population of the County's cities has increased by 4,623 people (16%) since 1990, while the population of its townships has increased by 2,224 (12%) over the same time period.

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Table 17: Population of Becker County's Cities and Townships Since 1970 (U.S. Census)

Political Subdivision		Year			20 Year Change	Percent Change
		1990	2000	2010		
Cities	Detroit Lakes	6,635	7,348	8,509	1,875	28%
	Audubon	411	445	519	108	26%
	Frazee	1,176	1,377	1,350	174	15%
	Lake Park	638	782	881	243	38%
	Total Cities	***8,860***	***9,952***	***11,259***	***2,399***	27%
Total Townships		***19,021***	***20,048***	***21,245***	***2,224***	12%
Becker County		***27,881***	***30,000***	***32,504***	***4,623***	16%

3.3.3 Comparable Growth

One of the best ways to compare the County's rate of population growth is to examine the growth rates of neighboring counties. Table 18 accomplishes this by including demographic information for the following counties: Chippewa, Meeker, Pope, Renville, Stearns, and Swift.

Table 18: Seven County Area Population Change since 1970 (U.S. Census)

County	Year					40 Year Change	Percent Change
	1970	1980	1990	2000	2010		
Chippewa	15,	14,9	13,2	13,0	12,4	-2,668	-17.66%
Becker	***30,***	***29,3***	***27,8***	***30,0***	***32,5***	***11,691***	***38.27%***
Meeker	18,	20,5	20,8	22,6	23,3	4,913	26.72%
Pope	11,	11,6	10,0	11,2	10,9	-112	-1.01%
Renville	21,	20,4	19,6	17,1	15,7	-5,409	-25.59%
Stearns	95,	108,161	118,791	133,166	150,642	55,242	57.91%
Swift	13,	12,9	10,7	11,9	9,78	-3,394	-25.76%

The statistics that appear in Table 18 indicate that Becker County has experienced above average population growth since 1970. In fact, the County was second only to Stearns County in the overall percentage of population increase among the seven counties compared. Stearns County's large increase is obviously directly related to the rapid growth that has occurred in the St. Cloud region.

3.3.4 Population by Age Groups

Table 19 shows the breakdown of Becker County's population by age categories for the years 1970 to 2010. While Becker County's total population has witnessed steady growth in recent years, the rate of population growth among the elderly (65 and older) has been significantly higher. In 1970, the County's elderly population was 3,971 persons. By 2010, this population grew by 48.5 percent, to

a Census count of 8,189 persons. The State Demographic Center projects the percent increase in elderly population will continue to grow at a larger rate than that of the total population over the next 30 years *(Minnesota's Changing Counties: The Next 30 Years)*. It is during this time frame that the "baby boomers" will reach their retirement age. This is a strong indicator of the increasing need for many senior-related services, including senior housing and transit services.

Table 19: Becker County's Population by Age Groups in 2010 (U.S. Census)

Age Group	Year				
	1970	1980	1990	2000	2010
Under 18	10,692(36%)	10,293(28%)	11,242 (29%)	10,980 (27%)	10,497 (32%)
18-24	3,055 (10.0%)	5,147 (14.0%)	3,488 (9%)	3,894 (9%)	2,124 (7%)
25-44	6,110 (20.0%)	9,191 (25.0%)	11,628 (30%)	10,907 (26%)	7,481 (23%)
45-64	6,720 (22.0%)	6,985 (19.0%)	6,589 (17%)	9,269 (23%)	7,484 (23%)
65 & Over	3,971 (13.0%)	5,147 (14.0%)	5,814 (15%)	6,153 (15%)	4,918 (15%)
Total	24,372 (100%)	29,336 (100%)	27,881 (100%)	30,000 (100%)	32,504 (100%)

3.3.5 Households

Table 20: Population, Households, and Average Household Size of Becker County since 1970 (U.S. Census)

Characteristic	Year				
	1970	1980	1990	2000	2010
Population	30,548	36,763	38,761	41,203	32,504
Households	9,272	12,852	14,327	15,936	18,784
Average Household Size	3.29	2.86	2.57	2.53	1.73

Table 20 shows exactly how the number of households has increased as Becker County has gained population since 1970. Although knowing the total number of people and households is important, these numbers allow an average County household size to be established (the average number of people living in each household). Notice that since 1970, the average household size in Becker County has decreased from 3.29 people per household to an average size of 1.73 people per household in 2010.

3.3.6 Population and Household Projections

The Minnesota State Demographic Center has published population and household projections for Becker County in five-year increments between 2000 and 2030. However, population and household projections should only be viewed as educated estimates based on historical data. There are a number of variables that directly and indirectly influence population levels including in-migration, out-migration, net births/deaths, and economic conditions. For this reason, the population, and household projections should only be used for general planning purposes.

Becker County is experiencing a shift in age. As the baby boomer generation is reaching retirement age, the elderly population will continue to grow. As the elderly population is compared to younger age groups, it is growing very rapidly in a relationship. The 60+-year-old age groups have doubled in size while some of the middle age groups are declining. This will present many challenges for Becker in considering mitigating with an elderly population in mind. The projections show in 2030, almost 25% of Becker County's population will be over 60. While the quality of life has increased for our retirees in today's world, this still presents challenges when considering families are moving further apart geographically and it will be up to the community to account for its citizens without much family help.

3.3.7 Special Populations

Special population is a term used to express a disadvantaged group for example populations with disabilities, minors, and the elderly. Special populations often require accommodations for physical, mental or emotional differences. Special populations must be carefully considered by emergency service providers. The tables below illustrate the special population in Becker County the statistics were provided by the Census Bureau. Below are tables of special populations identified in Becker County. Children, Elderly, and Females all represent special populations within the county.

Table 21: Children

Subject	2010 Census Data (US Census Bureau)
Family households with children	3,590
Married couples with children	2,451
Single mothers with children	780
Single fathers with children	359

The table illustrates the population of children within the county. The children population in the county has decreased from 2000 to 2010.

Table 22: Elderly

Subject	2010 Census Data (US Census Bureau)
65 to 69 years old	1,687
70 to 74 years old	1,352
75 to 79 years old	1,069
80 to 84 years old	758
85 years and older	771
Total	4,918

The elderly table is a recap of earlier stated county population data of just the 65 years old and older population. Currently, the number of 65 and older makes up 12.8% of the total county population, but this number will increase exponentially as the baby boomers age.

Table 23: Females

Subject	2010 Census Data (US Census Bureau)
Female Population	16,190
Under 18 years old	3,944
18 years and older	12,246
65 years and older	3,016

The female population table represents the number of females in the county. An interesting point shown in this table is the 65-year-old and older population total, 67% are women. Even before any further analysis of where they are at geographically or housing-wise in the county, there are probably a good number of elderly females who live alone.

Table 24: Population with a disability

The following data includes persons with a work disability, mobility disability, or a self-care limitation:

Subject	2010 Census Data (US Census Bureau)	Percentage
5 to 20 years old	530	7.4%
21 to 64 years old	2,685	16.8% 55.2% employed
65 and older	1,584	35%
Total	4,799	14.8%

Table 24 outlines the population with a disability in Becker County. The table is an overview of the total of those with a disability condition recognized in the 2010 census.

Table 25: Institutionalized Population

Subject	2010 Census Data (US Census Bureau)	Percentage
In group quarters	868	2.1%
Institutionalized	704	1.7%
Non- institutionalized	164	0.4%
Total	868	2.1%

According to the US Census Bureau, 2.1% of Becker County's population is considered institutionalized.

Table 26: Becker County Poverty

Subject	Minnesota State Demographic Center Data
All ages below poverty	4,920 (12.1%)
65 and older below poverty	467(7.6%)

The table is the number in Becker County who fall below the state poverty levels.

3.4 Cultural Conditions

The state of Minnesota has a rich cultural history dating back over 5,000 years ago with inhabitation of the region following the last Ice Age. The state's first inhabitants being Native Americans with the dominate tribes being the Dakota and Ojibwa (also called Chippewa or Anishinabe) Indians with cave drawings called petroglyphs found in several state parks throughout the region, such as in Jeffers Petroglyphs near Comfrey. Ancient burial mounds can also be found throughout the state.

The first European explorers came to the Minnesota region in the early 1600's. Etienne Brule in 1623 or 1624 was likely the first but Groseilliers and Radisson, in 1654 to 1660, are generally regarded as the first explorers of the region. These first explorations ultimately resulted in French sovereignty over Lake Superior.

Fort Snelling was the first permanent European settlement in Minnesota in 1825. The earliest settlers were primarily from the East Coast with most immigration from Germans and Scandinavians by the late 1860's.

Minnesota became the 32nd state in the union in 1858. On October 27, 1849, nine large Minnesota counties were created. Among them were Benton, Dahkotah, Itasca, Ramsey, Mahkahta, Pembina, Wabasha, Washington, and Wahnata. Of those Benton, Dakota, Itasca, Ramsey, Wabasha, and Washington hold original names. With the creation of Kittson County on March 9, 1878, Pembina County no longer existed. When Minnesota was organized as a state, 57 of the present 87 counties were established. The last county to be established was Lake of the Woods County in 1923.

3.4.1 Race and Ethnicity

There is limited cultural diversity based on race and ethnicity in Becker County. 88.4 percent of the County identified as White in the 2010 U.S. Census.

Table 27: Population of Becker County by Race and Ethnicity

RACE	Number	Percentage
Total population	32,504	100.0
One Race	31,532	97.0
White	28,720	88.4
Black or African American	138	0.4
American Indian and Alaska Native	2,455	7.6
Asian	125	0.4
Asian Indian	9	0.0
Chinese	21	0.1
Filipino	19	0.1
Japanese	10	0.0
Korean	27	0.1
Vietnamese	29	0.1
Other Asian [1]	10	0.0
Native Hawaiian and Other Pacific Islander	7	0.0
Native Hawaiian	7	0.0
Guamanian or Chamorro	0	0.0
Samoan	0	0.0
Other Pacific Islander [2]	0	0.0
Some Other Race	87	0.3
Two or More Races	972	3.0
White; American Indian and Alaska Native [3]	765	2.4
White; Asian [3]	60	0.2
White; Black or African American [3]	62	0.2
White; Some Other Race [3]	21	0.1

The following table illustrates that there is a distinct majority regarding the language spoken in the homes of residents of Becker County. With 95.7% of residents speaking only English at home and only 1% of residents speaking Spanish.

Table 28: Language Spoken at Home in Becker County

LANGUAGE SPOKEN AT HOME	Number	Percentage
Population 5 years and over	30,416	30,416
English only	29,108	95.7%
Language other than English	1,308	4.3%
Speak English less than "very well"	294	1.0%
Spanish	319	1.0%
Speak English less than "very well"	25	0.1%
Other Indo-European languages	620	2.0%
Speak English less than "very well"	191	0.6%
Asian and Pacific Islander languages	64	0.2%
Speak English less than "very well"	48	0.2%
Other languages	305	1.0%
Speak English less than "very well"	30	0.1%

3.4.2 Level of Education

The next table indicates the level of education of the residents of Becker County. This indicates that of the population in Becker County 25 and over, the majority of the county has graduated from high school and attended some college.

Table 29: Level of Education for Becker County

EDUCATIONAL ATTAINMENT	Number	Percentage
Population 25 years and over	22,392	22,392
Less than 9th grade	766	3.4%
9th to 12th grade, no diploma	1,497	6.7%
High school graduate (includes equivalency)	7,413	33.1%
Some college, no degree	5,589	25.0%
Associate's degree	2,361	10.5%
Bachelor's degree	3,334	14.9%
Graduate or professional degree	1,432	6.4%

Source: U.S. Census 2010

3.4.3 Socioeconomic Conditions: Income

The income per household in Becker County as of 2012 can tell a lot about the County as a whole. There is a total of 13,454 households in the county. The income range with the highest number of households is the $50,000-$74,999 range, with the second largest income range being $35,000-$49,999. These statistics indicate that almost half the households in the county have income ranges within the lower to mid middle class.

Table 30: Income and Benefits per Household in 2012 Becker County

INCOME AND BENEFITS (IN 2012 INFLATION-ADJUSTED DOLLARS)		
Total households	13,454	13,454
Less than $10,000	751	5.6%
$10,000 to $14,999	889	6.6%
$15,000 to $24,999	1,699	12.6%
$25,000 to $34,999	1,556	11.6%
$35,000 to $49,999	1,936	14.4%
$50,000 to $74,999	2,894	21.5%
$75,000 to $99,999	1,766	13.1%
$100,000 to $149,999	1,337	9.9%
$150,000 to $199,999	321	2.4%
$200,000 or more	305	2.3%
Median household income (dollars)	49,159	(X)
Mean household income (dollars)	61,038	(X)

3.4.4 Employment Status

The following table indicates that the unemployment rate in Becker County is actually less than the national average. The national average unemployment rate is 6.9% and the actual unemployment in Becker County in 2010 was just 5.2%.

Table 31: Employment Status in Becker County Estimates from 2008-2012

Subject	Becker County, Minnesota	
	Estimate	Percent
EMPLOYMENT STATUS		
Population 16 years and over	25,486	25,486
In labor force	16,683	65.5%
Civilian labor force	16,674	65.4%
Employed	15,812	62.0%
Unemployed	862	3.4%
Armed Forces	9	0.0%
Not in labor force	8,803	34.5%

Source: U.S. Census Bureau

3.4.5 Occupation

The following table shows that the majority of occupations by people in Becker County are either in Office or Management, Business, Science or Service Occupations. These two occupation types make up almost half of the occupations in the County.

Table 32: Occupations in Becker County (estimates from 2008-2012)

OCCUPATION	Estimate	Percent
Civilian employed population 16 years and over	15,812	15,812
Management, business, science, and arts occupations	4,930	31.2%
Service occupations	2,634	16.7%
Sales and office occupations	3,709	23.5%
Natural resources, construction, and maintenance occupations	2,081	13.2%
Production, transportation, and material moving occupations	2,458	15.5%

3.4.6 Commercial Trends

As of 2012, there was a total of 968 employer establishments in Becker County, MN. The following table outlines the type of sector and the number of establishments for each sector.

Table 33: Employer Establishments

Type of Establishment	Number of Establishments
Total for all sectors	968
Agriculture, forestry, fishing, and hunting	4
Utilities	1
Construction	169
Manufacturing	44
Wholesale trade	41
Retail trade	135
Transportation and warehousing	67
Information	9
Finance and insurance	56
Real estate and rental and leasing	34
Professional, scientific, and technical services	54
Management of companies and enterprises	2
Administrative and support and waste management and remediation services	44
Educational services	1
Health care and social assistance	78
Arts, entertainment, and recreation	23
Accommodation and food services	87
Other services (except public administration)	118
Industries not classified	1

3.4.7 Faith Based Community

In Becker County, the faith-based community is strong with 2/3rds of the entire county population participating in their religion of choice. The majority of the county is predominantly Lutheran with Catholicism ranking second. The adherent totals of the religious groups listed below (21,824) included 67.1% of the total population in 2010.

Many churches offer services which can supplement the plans and recovery efforts of a community. Table 34 outlines the number of adherents making it possible to identify the larger religious bodies.

The faith-based communities have had a long history of providing a communication and reaction conduit for those expressing an interest in disseminating information.

Table 34: Religious Bodies

Religious Bodies	Tradition	Family	Congregations	Adherents	Adherence Rate†
Amish Groups, undifferentiated *	Evangelical Protestant	European Free-Church	1	114	3.5
Apostolic Lutheran Church of America	Evangelical Protestant	Lutheran	1	---	---
Assemblies of God	Evangelical Protestant	Pentecostal	4	244	7.5
Bahá'í	Other	Other Groups	0	1	0.0
Catholic Church	Catholic	Catholicism	15	7,400	227.7
Christian and Missionary Alliance, The	Evangelical Protestant	Holiness	2	654	20.1
Church of Jesus Christ of Latter-day Saints, The	Other	Latter-day Saints	1	217	6.7
Church of the Lutheran Confession	Evangelical Protestant	Lutheran	2	---	---
Conservative Baptist Association of America	Evangelical Protestant	Baptist	2	---	---
Episcopal Church	Mainline Protestant	Episcopalianism/Anglicanism	3	264	8.1

Religious Bodies	Tradition	Family	Congregations	Adherents	Adherence Rate†
Evangelical Free Church of America, The	Evangelical Protestant	Methodist/Pietist	1	80	2.5
Evangelical Lutheran Church in America	Mainline Protestant	Lutheran	15	6,541	201.2
Evangelical Lutheran Synod	Evangelical Protestant	Lutheran	1	118	3.6
Jehovah's Witnesses	Other	Adventist	1	---	---
Lutheran Church--Missouri Synod	Evangelical Protestant	Lutheran	7	3,066	94.3
Lutheran Congregations in Mission for Christ	Evangelical Protestant	Lutheran	2	186	5.7
Mennonite Church USA	Evangelical Protestant	European Free-Church	2	106	3.3
Non-denominational	Evangelical Protestant	----	4	757	23.3
Seventh-day Adventist Church	Evangelical Protestant	Adventist	1	228	7.0
United Church of Christ	Mainline Protestant	Presbyterian-Reformed	1	215	6.6
United Methodist	Mainline Protestant	Methodist/Pietist	2	454	14.0

Religious Bodies	Tradition	Family	Congregations	Adherents	Adherence Rate†
Church, The					
Vineyard USA	Evangelical	Pentecostal	1	1,179	36.3
		Totals:	**69**	**21,824**	

2010 U.S. Religion Census: Religious Congregations & Membership Study. Collected by the Association of Statisticians of American Religious Bodies (ASARB) and distributed by the Association of Religion Data Archives (www.theARDA.com).

3.4.8 Economic Conditions

Table 35 shows the most common industries in the county and displays percentages each industry. The following table, Table 36, outlines the profile for Becker County with regards to farms. The total employment for the county is 22,371 jobs and of those, 1,371 are farm employment. Among all the Minnesota counties, Becker County ranks 44 in crop production, number 41 in livestock production and number 43 in total agricultural production. The table outlines the percent change seen from 2007 to 2012. As you can see, the acreage of land used for farms and average size has increased in the time period indicated, however, the number of farms has decreased by 8 percent. This is critical information because agriculture is a big industry in the County.

Table 35: Most Common Industries in the County

INDUSTRY	Total	Percentage
Civilian employed population 16 years and over	15,812	100%
Agriculture, forestry, fishing and hunting, and mining	799	5.1%
Construction	1,300	8.2%
Manufacturing	2,114	13.4%
Wholesale trade	357	2.3%
Retail trade	2,095	13.2%
Transportation and warehousing, and utilities	846	5.4%
Information	202	1.3%
Finance and insurance, and real estate and rental and leasing	705	4.5%
Professional, scientific, and management, and administrative and waste management services	866	5.5%
Educational services, and health care and social assistance	3,733	23.6%
Arts, entertainment, and recreation, and accommodation and food services	1,237	7.8%
Other services, except public administration	860	5.4%
Public administration	698	4.4%

Table 36: Becker County Farm Profile

	2007	2012	Percent Change
Number of Farms	1,202	1,107	-8
Land in Farms	395,858	434,917	+10
Average Size of Farm	329 acres	393 acres	+19

Source: U.S. Census of Agriculture

3.4.9 Future Development

Current economic trends for the region are as follows:

1. Aspects of agriculture have plummeted in recent years. Counties in the region with the most population loss often are agriculturally dependent. Population loss is an important issue in many counties.

2. Employment in the region has increased since 1990, but it is not an even growth. The gain is not enough to prevent population loss. Large losses are seen in agriculture and self-employment

3. Some recent growth in the service and retail portions of the workforce is related to outside visitors coming to the region and surrounding areas for recreational purposes.

4. Agricultural lands and natural areas are a majority of the landscape in the region. The ensuing environment befits the preferences of a rural population.

3.4.10 Crime

The following table outlines the number and type of crime in Becker County from 2005.

Table 37: Crimes Known in 2005 in Becker County

Type of Crime	Number of Known Crimes
Murders	0
Rapes	2
Robberies	3
Assaults	19
Burglaries	83
Thefts	128
Auto Thefts	44

3.5 Critical Infrastructure

The term built environment refers to the human-made surroundings that provide the setting for human activity, ranging in scale from personal shelter and buildings to neighborhoods and cities that can often include their supporting critical infrastructure (bridges, water treatment, and highways) and key resource (schools and museums) assets. The built environment is a material, a spatial and cultural product of human labor that combines physical elements and energy in forms necessary for living, working and playing. In urban planning, the phrase connotes the idea that a large percentage of the human environment is man-made, and these artificial surroundings are so extensive and cohesive that they function as organisms in the consumption of resources, disposal of wastes, and facilitation of productive enterprise within its bounds.

The County's infrastructure and facilities are important for its normal functioning and the health, safety, and general welfare of its residents. This section identifies Becker County's important critical infrastructure and facilities, including subsections on transportation, schools, medical facilities, waste facilities, and historic sites.

3.5.1 Airports

The Detroit Lakes Airport is the only publicly owned airport that is located in Becker County. There are other numerous airstrips that are privately owned. The Detroit Lakes Airport is under the jurisdiction both the county and the city of Detroit Lakes. It houses between forty-six and fifty aircraft within its hangars. Service provided includes nonscheduled flights, charter service, maintenance/repair and storage. About

14,650 planes either took off or landed at the Detroit Lakes Airport in 2000 (estimate). In 1999, an aviation plan was written documenting needs for this airport, including an extension of 500 feet of the 4,500-foot runway and the construction of a parallel taxiway. The airport has courtesy rides to town for private air passengers. This assists with Detroit Lakes ability to be maintain itself as a popular vacationing destination additionally, there are a multitude of motels and restaurants nearby.

3.5.2 Railroads

There are two railroads that service the Becker County area. One of them is the Burlington Northern and Santa Fe railroad (BNSF), a Class I variety with over $256.4 million in annual gross operating revenue. This railroad is 250 miles long in Minnesota (extending from Moorhead to Minneapolis). Twenty-six miles of this cross Becker County. Up to ninety trains utlize the tracks in Becker County, some going as fast as seventy-nine miles per hour. The BNSF railroad is one of the fastest and highest volume rail corridors in the state. The railroad hauls coal, grain, chemicals, lumber, automobiles and containers through the borders.

The Canadian Pacific railroad runs north and south and connects Canada to the upper Midwestern United States. This line is thirty miles long in Becker County and is also a class I. The Canadian Pacific crosses the BNSF in Detroit Lakes, making it a hub of the county. The Canadian Pacific is only a freight railroad, hauling lumber, grain, and fertilizer. Approximately nine Canadian Pacific trains a day cross Becker County.

Amtrak also manages two passenger trains a day that run through Becker County on BNSF tracks. The county is part of a route that stretches from Chicago to the Seattle/Portland area. These trains stop in Detroit Lakes in the early morning hours. One train goes east, the other goes west.

BNSF has thirty-nine railroad crossings in Becker County. Thirty-eight are at grade crossings (roadway and tracks are at the same elevation) and one is grade separated (road goes over the tracks). Similarly, there is only one grade separated crossing at the Canadian Pacific line, and thirty-two at grade crossings. According to the Becker County Comprehensive Zoning Plan, done in 2003, only twelve crashes between automobile and train have occurred at grade crossings since 1995. Most of these occurred at roads where traffic volume was low. In response to this, MNDOT office of Freight, Railroads & Waterways prepared a comprehensive plan. Specific issues that contribute to railroad crossing accidents in Becker County are listed below:

-Poor visibility
-Poor approach condition
-Poor railroad alignments
-Deficient warning devices
-Poor conditioned signage
-Lack of signage
-Permanent structures blocking the driver's view of the railroad tracks
-Driver distraction
-Changing traffic patterns

Table 38: FRA Railroad Track Classification

Class	Freight Speed (mph)	Passenger Speed (mph)
One	10	15
Two	25	30
Three	40	60
Four	60	80

The efficiency of a railroad is affected by the physical condition of the rail lines. The Federal Railroad Administration (FRA) track classification is based upon the physical characteristics of the roadbed, track geometry, and track structure. There are four different track classifications with maximum freight and passenger speeds (Table 38). Characteristics related to the roadbed include drainage and vegetation. Track geometry includes gauge, alignment, elevation, and surface. Track structure involves ballast, ties, rail, spikes, joints, and switches. These characteristics determine the allowable operating speeds for each rail line.

The weight restriction of a particular line has a great effect on the movement of grain traveling through the County. The most efficient means for rail shipment of grain is by 100-ton hopper cars. Such cars have a gross weight of 263,000 pounds. Without access to a rail with strength to handle these hopper cars, a shipper must choose between small rail cars or truck transportation. Both the CP/Soo and BNSF rail lines are designated to handle over 263,000 pounds. As a result, the CP/Soo and BNSF rail lines both bear over 10,000,000 gross tons of freight annually.

3.5.3 Pipelines

The energy transportation network of the United States consists of over 2.5 million miles of pipelines. That's enough to circle the earth about 100 times. These pipelines are operated by approximately 3,000 companies, large and small. Based on data generated from annual reports to PHMSA from pipeline operators, the network includes approximately:

- 175,000 miles of onshore and offshore Hazardous Liquid pipeline;
- 321,000 miles of onshore and offshore Gas Transmission and Gathering pipelines;
- 2,066,000 miles of Gas Distribution mains and service pipelines;
- 114 active LNG Plants connected to our gas transmission and distribution systems; and
- Propane Distribution System pipelines.

Although pipelines exist in all fifty states, most of us are unaware that this vast network even exists. This is due to the strong safety record of pipelines and the fact that most of them are located underground. Installing pipelines underground protect them from damage and helps protect the communities as well.

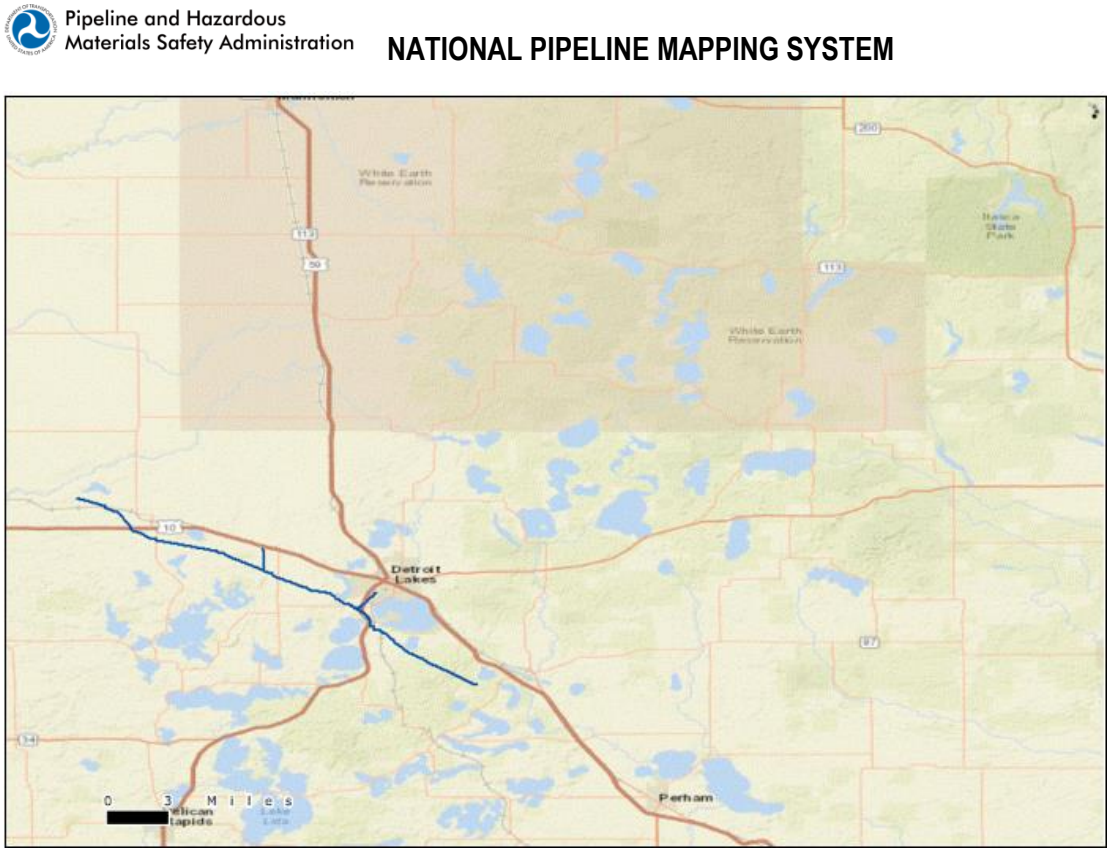
Table 39 outlines the pipelines and the utility it carries in Becker County. The majority of the pipelines which run through Becker County are natural gas. The pipelines run near Audubon and Detroit Lakes.

Table 39: Pipelines

Pipeline	Utility
Alliance	Natural Gas
Center Point Energy	Natural Gas
Dooley's Natural Gas	Natural Gas
Kinder Morgan	Natural Gas
Magellan	Crude Oil
Northern Natural Gas	Natural Gas Pipeline
Sheehan's	Natural Gas
Xcel Energy	Natural Gas

Most hazardous liquid and gas *transmission* pipelines are located underground in rights-of-way (ROW). A ROW consists of consecutive property easements acquired by, or granted to, the pipeline company. The ROW provides sufficient space to perform pipeline maintenance and inspections, as well as a clear zone where encroachments can be monitored and prevented.

Figure 12: Pipelines in Becker County



Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.
This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.
Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com.
Projection: Geographic Datum: NAD83
Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Pipeline operators are required to post brightly-colored markers along their ROW to indicate the presence of – but not necessarily the *exact* location of – their underground pipelines. Markers come in a variety of shapes and sizes. They contain information about the nearby pipeline as well as emergency contact information for the company that operates it.

Gas distribution systems consist of distribution main lines and service lines. Distribution main lines are generally installed in underground utility easements alongside streets and highways. Distribution service lines run from the distribution main line into homes or businesses. Distribution main and service lines are not generally indicated by above-ground markers.

Pipelines play a vital role in our daily lives. Cooking and cleaning, the daily commute, air travel and the heating of homes and businesses are all made possible by the readily available fuels delivered through pipelines.

These routine activities really add up, in terms of energy use. Natural gas provides for fully 24% of our country's *total energy consumption*, and petroleum provides for another 39%. Because such huge volumes of hazardous liquids and gas must be transported, the only feasible way to do so is through pipelines. Pipelines do not crowd our highways and waterways as trucks and barges would, nor do they contribute to traffic congestion or highway accidents. (U.S. Department of Transportation)

3.5.4 Becker County Sanitary Landfill/ Regional Household Hazardous Waste Facility

The Becker County Sanitary Landfill is the only landfill in the County permitted through the MPCA. The facility is located in Section 23 of Lake Andrew Township. Becker County also has a Regional Household Hazardous Waste (HHW) Facility located in Detroit Lakes. Products accepted at the HHW facility include paint, stain, varnish, fuels, pesticides, aerosols, poisons, and acids. In addition to serving all of Becker County, the facility also serves the following counties: Big Stone, Chippewa, Lac qui Parle, Meeker, Renville, and Swift. This facility is also licensed to accept hazardous waste from very small quantity generators on an appointment basis.

3.5.5 Transit

Mass transit is considered to be an essential public service. Mass transit provides for increased capacity on heavily traveled roads, provides transportation access to persons with disabilities or those otherwise unable to drive, supports dense land use development, decreases dependence on car use, and helps to prevent the creation of additional air pollution from diminished individual car use.

Becker County Transit is the only public transport system in the county. This service is focused on six major areas: Audubon, Callaway, Detroit Lakes, Frazee, Lake Park and Ogema. Twice each month, a scheduled rural route comes through the towns of Richwood, White Earth, Snellman, Wolf Lake, and Cormorant. Dial-a-ride service is offered as well as a fixed or deviated flexible route or a scheduled rural route.

3.5.6 Trails

Trails in Becker County consist mostly of continuously networked snowmobile trails. There are more than one thousand miles available for riders to use during winter months. Routes cross public/private land, are located near lakes and border roads in ditches. These routes may change from year to year if a private landowner does not give permission for a route to cross his land. Accommodations such as restrooms and resorts are located along these trails. Examples of snowmobile clubs in the county include the Ultra Snowmobile Club and the Wolf Pack Snowmobile Club. Some of the trails can double as a hiking or biking trail during the summer.

Trails are also set aside for non-motorized activity. Examples of modes of transportation to use these trails include hiking, jogging, biking and cross country skiing. Some trails are prepared to be in use all year long. One example is located at Dunton Locks Park and is two-thirds of a mile long. Cross-country skiing trails are also located at Detroit Mountain, and ski trails are positioned at Frazee and Pine Lake. More mountain biking opportunities might be needed within the county, however.

Currently, there are few trails made specifically for ATV use and this is a problem for Becker County. ATVs can currently use roads in the state forest and county-managed land unless access to ATVs is prohibited, however, mileage is often limited. Unless there is a specific trail constructed for ATVs, riders may drive on snowmobile trails or other trails that are not for ATV use. This could result in damage to the trail as well as harm to wetlands and destruction of the shorelines. The Forest Riders ATV Club manage the majority of the trails located in Becker County. The club wants to increase ATV trail mileage in the future.

In the summer of 2007, a new seventy-mile trail for ATVs and motorcycles was created. The DNR was reviewing possible sites for an ATV/OHM trail and Becker County was selected. Located on state and county administered forest lands, the new trail can be found in north-central Becker County in North and South Round Lake Townships. Trails will range from easy to difficult and rest areas/picnic facilities will also be included. Campgrounds and resorts can be found within a half hour's drive.

For the nature enthusiast, there is a new birding trail that runs through the county called the Pine to Prairie birding trail. This trail covers more than 200 miles of Minnesota and features 43 stops. More than 275 species of birds can be viewed while on this trail.

Becker County is home to the Lake Country Scenic Byway. This eighty-eight mile drive stretches from Detroit Lakes (Becker County) to Walker (Cass County), Minnesota. Along the way, a national forest, state park, a national wildlife refuge and six state forests can be seen. More than 1,000 various sources of water can be seen along this trail. Many experiences are offered on this trail, fun for any season.

3.5.7 Transportation

The primary purpose of any transportation system is to move goods and people both safely and efficiently. An efficient and balanced transportation system includes highways, railroads, mass transit, and aeronautics. While the most influential mode of transportation is the automobile, the other types of transportation play an important role in the overall network.

Becker County's transportation system is made up of the township, county, and state roads, railways, an airport, trails, and public transportation. Through these pathways come materials and services needed to

sustain the area. Agriculture, various businesses, tourism, government, and residents are all dependent on the transportation system.

3.5.8 Highways

The current highway network in Becker County has been built in response to an ever- increasing public demand for improved mobility. The local units of government and MN/DOT are all responsible for assuring that the total highway system operates properly and the roads owned by the different levels of government are integrated into the overall highway system. Becker County is well served by an extensive roadway network, which connects the County with the rest of the region and the State. Becker County has a well-balanced mix of City, Township, County, and State roadways nicely spaced throughout the County.

The Functional Classification System is a method used to describe the main function each road performs in the highway network. It is essentially a hierarchy of roads using criteria that describe the function that a particular road performs in a highway network (typically access and mobility). There is a general agreement among the public that the responsibility for the most important roads should be assigned to the highest level of government. In this fashion, the greatest resources for road maintenance and construction are devoted to the most heavily traveled roads. It follows that less traveled roads become the responsibility of local levels of government. Definitions for each of the road types in the Functional Classification System are provided below:

- **Principal Arterial –** These highways provide an integrated network of routes, which carry the highest traffic volumes, serve the longest trip movements, and provide for statewide or interstate travel. They serve all major urbanized areas and population centers. Principal arterial routes provide for through movement with minimum interference.

- **Minor Arterial –** These highways link cities, larger towns, and other major traffic generators, such as major resort areas, to each other and to principal arterial routes. They form an integrated network which provides for movement within the State and between counties.
- **Major Collectors –** These routes provide service to the county seat and to the larger cities not served by principal or minor arterials. They predominately serve trips within the County and link locally important traffic generators with their service areas and other nearby larger cities with higher order routes.

- **Minor Collectors –** These routes link smaller cities and locally important traffic generators and provide developed areas with reasonable access to a higher functioning roadway.

- **Local Roads –** The rural local roads primarily service relatively low traffic volumes and short distance trips.

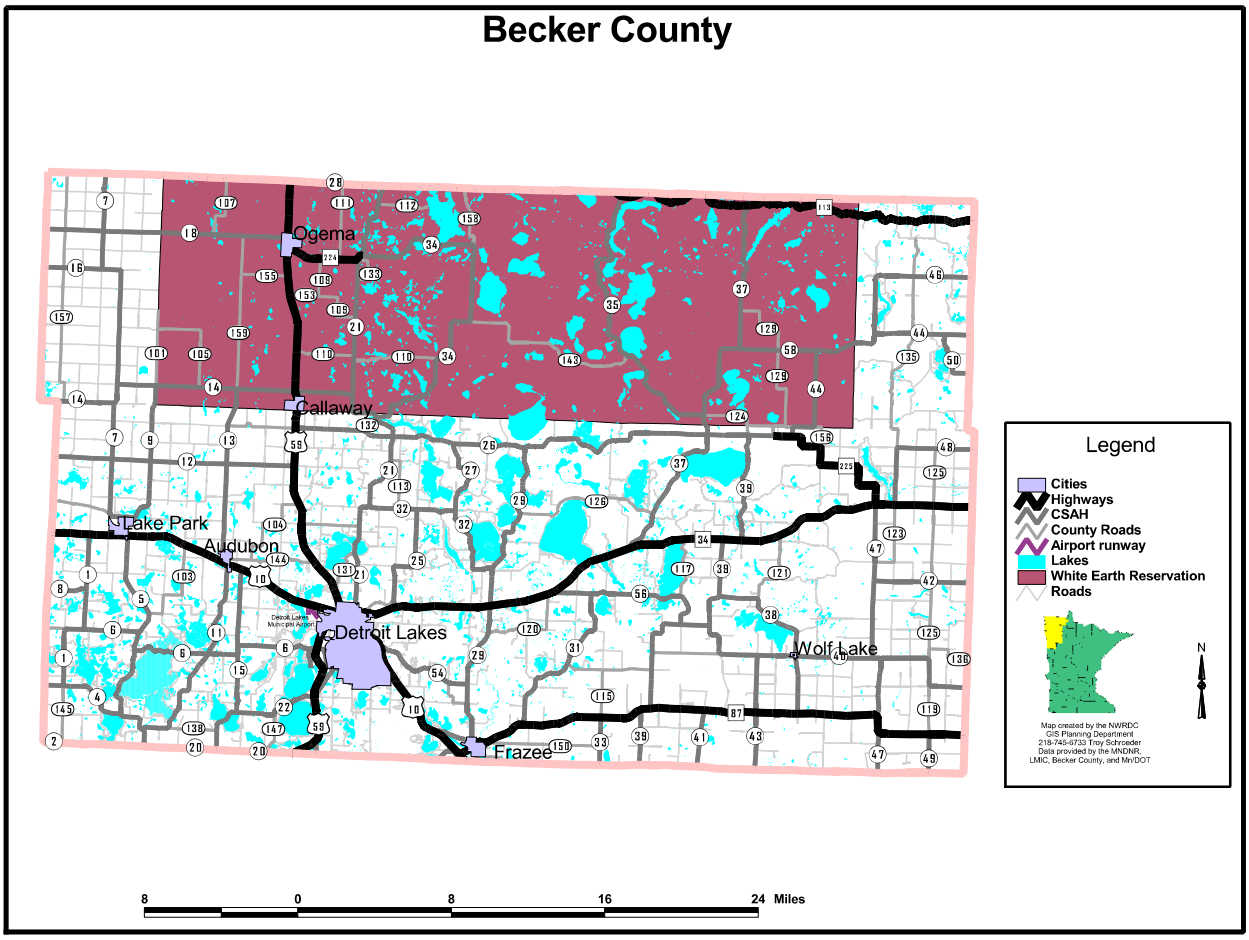
A breakdown of the Rural Functional Classification System for Becker County is given in Table 40. Notice that the vast majority of roads are classified as Local Roads (66%), with lesser percentages in the Major and Minor Collectors (25%), Minor and Principal Arterial (10%), and Principal Arterial (6%) categories. Generally, these percentages are within the suggested guidelines established by the MN/DOT for rural areas.

Table 40: Road Types

Road Type	Becker County (%)	MN/DOT Suggested (%)
Principal Arterial	6	2-4
Minor and Principal Arterial	10	6-12
Major and Minor Collectors	25	20-25
Local Roads	66	65-75

In order to protect the integrity and prolong the lifespan of the roads, weight restrictions are imposed on the paved roads in Becker County. Spring weight restrictions are intended to restrict weights on roads when they are most vulnerable to damage. Spring is a critical period for roads because the soils and aggregate materials are weak while the frost leaves the road. By State law, all County and Township roads are automatically reduced to five-ton per-axle weight limit (unless posted otherwise) at the same time as spring road restrictions are placed on state highways.

Figure 13: Becker County Roads



3.5.9 Water Control Structures

Table 41 lists the 25 water control structures that have been classified as dams by the DNR, most of which have been assigned a hazard potential. A dam's hazard potential is rated 1 to 3; the lower the rating a dam receives, the higher the risk for structural, economic, and human life loss if it were to fail. According to the Table, a majority of the dams in the County have been classified as having a hazard potential rating of 3 (the safest rating). More detailed information on the dams in Becker County and the hazard potential can be found in Section 4, the Risk Assessment portion of this plan.

Table 41: Becker County Dams

DNR ID	Name	Section	Township	Range	Hazard Potential
MN01154	Big Becker Lake	34	118N	34W	3
MN00067	Calhoun Lake Diversion	28	121N	33W	3
MN00066	Calhoun Lake Outlet	28	121N	33W	3
MN00075	Calhoun Lake West	20	121N	33W	3
MN00069	Diamond Lake	NA	NA	NA	3
MN01153	Eagle Lake	25	120N	35W	3
MN00498	Elkhorn Lake Rearing Pond	25	120N	35W	3
DNR ID	**Name**	**Section**	**Township**	**Range**	**Hazard Potential**
MN00495	Fisher Unit Pond	NA	NA	NA	3
MN00068	Florida Lake	34	121N	35W	3
MN00496	Florida Slough Lake	32	121N	35W	3
MN00060	Foot Lake	16	119N	35W	3
NA	Games Lake	33	122N	35W	NA
MN00370	Green Lake	30	121N	33W	3
MN00064	Becker Lake Inlet	23	118N	34W	3
NA	Lake Andrew	11	121N	35W	NA
NA	Lake Elizabeth	2	118N	33W	NA
NA	Lake Wagonga	8	118N	34W	NA
MN00493	Langsjoen WPA	NA	NA	NA	3
MN00063	Little Becker Lake	3	118N	34W	3
MN00065	Long Lake	6	121N	33W	3
MN00061	Nest Lake	27	121N	34W	3
MN00062	New London	10	121N	34W	1
MN00497	Swan Lake	NA	NA	NA	3
MN01155	Wagonga Lake	33	119N	34W	3
MN00494	Weber Fish and Wildlife	NA	NA	NA	3

3.5.10 Public Water Accesses

The Minnesota Department of Natural Resources (DNR), through its Public Water Access Program, manages over 1,500 trailers and carry in boat accesses on Minnesota's lakes and rivers. These accesses usually remain open 24 hours a day unless posted and are patrolled by conservation officers. There is no fee for their use. However, accesses located within a State Park require a daily or annual State Park sticker. The Public Water Access Program also provides other water access amenities such as fishing piers and shore fishing sites for those who may not have a boat. Fishing piers and shoreline enhancements are barrier free and are

generally operated and maintained by local units of government.

The goal of the Public Water Access Program is to provide free access to Minnesota's lakes and rivers. The program strives to meet the increasing demand on the State's water resources for all boating activities. The Public Water Access Program works year round on acquisition, development and maintenance of water access sites. Funds to provide public accesses are derived through boat license fees and a portion of gas tax revenues attributed to motorboats. In addition, funding is periodically provided through the Legislative Commission on Minnesota Resources (LCMR) and the State Bonding Program.

Table 42 provides information on the 47 public water accesses that are located in Becker County, as well as fishing piers within the County.

Table 42: Public Water Accesses

Waterbody/Course Name	Ramp Type	Administrator
Acorn Lake	Concrete	DNR
Bad Medicine Lake	Asphalt	DNR
Bass Lake	Earth	County
Bass Lake	Earth	County
Bass Lake	Earth	County
Big Basswood Lake	Carry in	County
Big Rush Lake	Earth	County
Big Sugar Bush Lake	Concrete	County
Blackbird Lake (NW)	Earth	USFWS
Blackbird Lake (SW)	Carry in	USFWS
Blueberry Lake	Concrete	DNR
Boot Lake	Concrete	DNR
Boyer Lake	Concrete	DNR
Buffalo Lake	Gravel	USFWS
Carman Lake	Concrete	DNR
Cedar Lake	Concrete	DNR
Cormorant Lake (NW)	Concrete	DNR
Cormorant Lake (W)	Concrete	DNR
Cotton Lake	Concrete	DNR
Detroit Lake (NE)	Concrete	MN DOT
Detroit Lake (NW)	Concrete	City
Detroit Lake (SE)	Concrete	DNR
Dinner Lake	Concrete	DNR
Eagle Lake	Concrete	Township
Elbow Lake	Earth	County
Eunice Lake	Concrete	County
Floyd Lake	Concrete	DNR

Hanson Lake	Concrete	DNR
Height of Land Lake (E)	Concrete	County
Height of Land Lake (S)	Concrete	DNR
Height of Land Lake (N)	Gravel	USFWS
Howe Lake	Carry in	DNR
Hungry Lake	Gravel	DNR
Hungry Man Lake	Concrete	DNR
Ida Lake	Concrete	DNR
Island Lake	Concrete	DNR
Juggler Lake	Earth	County
Kane Lake	Earth	Township
Knutson Lake	Carry in	County
Labelle Lake	Concrete	DNR
Leif Lake	Concrete	DNR
Little Bass Lake	Carry in	County
Little Bemidji Lake	Earth	DNR
Little Cormorant Lake	Concrete	DNR
Little Floyd Lake	Concrete	DNR
Little Long Lake	Earth	County
Little Mantrap Lake	Earth	County
Little Sugar Bush Lake	Concrete	DNR
Little Toad Lake	Concrete	DNR
Long Lake (Airport Park)	Concrete	City
Many Point Lake	Gravel	Tribe
Marshall Lake	Concrete	DNR
Maud Lake	Concrete	DNR
Meadow Lake	Concrete	DNR
Melissa Lake	Concrete	DNR
Middle Cormorant Lake	Concrete	DNR
Monson Lake	Earth	County
Net Lake	Earth	County
Otter Tail River - Wannagan	Carry in	DNR
Pearl Lake	Concrete	DNR
Perch Lake	Earth	County
Pickerel Lake	Concrete	DNR
Pine Lake	Gravel	USFWS
Rice Lake	Gravel	USFWS
Rock Lake	Concrete	DNR
Round Lake	Earth	DNR
St. Clair Lake	Earth	County

Sallie Lake	Concrete	DNR
Sallie Lake	Fishing pier	DNR
Sauers Lake	Concrete	MN DOT
Shell Lake	Concrete	DNR
Shipman Lake	Earth	County
Siverston Lake	Asphalt	DNR
Straight Lake	Concrete	DNR
Straight Lake	Fishing pier	DNR
Strawberry Lake	Concrete	DNR
Tamarack Lake (N)	Earth	USFWS
Tamarack Lake (NE)	Earth	USFWS
Tamarack Lake (SE)	Earth	USFWS
Tilde Lake	Concrete	DNR
Toad Lake	Concrete	DNR
Town Lake	Concrete	City
Town Lake	Fishing pier	City
Turtle Lake	Concrete	DNR
Two Inlets Lake	Concrete	DNR
Upper Cormorant Lake	Earth	DNR
Waboose Lake	Earth	USFWS
White Earth Lake	Concrete	County
Winter Lake	Earth	USFWS
Wolf Lake	Earth	County

Source: Minnesota Department of Natural Resources, Division of Trails and Waterways

3.5.11 State and Federal Wild and Scenic Rivers/ Canoe and Boating Routes

The Minnesota State Wild and Scenic Rivers Program were established in 1973 to protect rivers which have outstanding natural, scenic, geographic, historic, cultural and recreational value. Once a river is designated as a part of the program, a management plan, which outlines the rules and goals for that waterway, is developed. The management plan is designed to work in conjunction with local zoning ordinances to protect the river from pollution, erosion, over-development, and degradation. Six rivers in Minnesota have segments that are designated as wild, scenic, or recreational under the State Wild and Scenic Rivers Program, none of which are located in Becker County.

The Minnesota Department of Natural Recourses (DNR) has designated 19 Canoe and Boating Routes, most of which are located in the eastern half of the State. Currently, there are no such designated routes in Becker County.

3.5.12 Implications and Assessment

Becker County is rich with water-based recreational lands. The County has one State Park, seven County parks, two municipal swimming beaches and forty-seven public water accesses that are associated with surface water resources. Besides publicly owned lands, there is an abundance of privately owned resorts, motels, and camps oriented around water-based recreation. Becker County should support State and local efforts to maintain and/or expand public and private water-based recreation opportunities within the County.

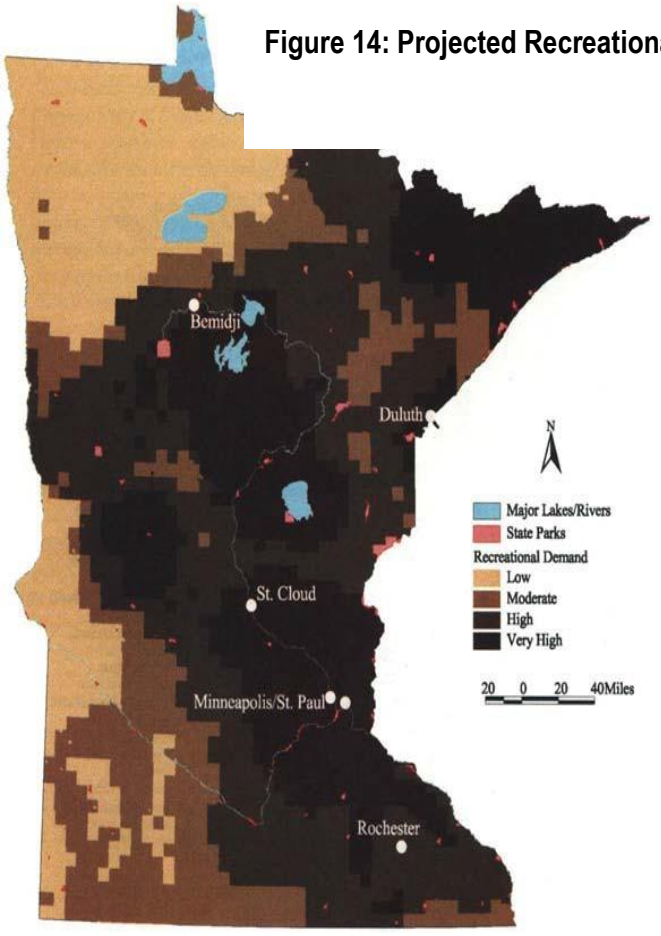


Figure 14: Projected Recreational Demand in 2025

According to Figure 4A, which is taken from the *2000 Minnesota State Park System Land Study*, Becker County's projected recreational demand in 2025 is expected to be in the moderate to high range. To meet this projected demand, the County should work with the Minnesota Department of Natural Resources (DNR) to identify locations that have the potential for expanding water-based recreation. The County should also pursue grants and other available funding to acquire and maintain water-based recreational lands.

Water and related land resources can be better managed to protect and/or enhance the County's water-based recreational lands through the implementation of best management practices (BMPs). Programs, such as continuous CRP and EQIP, provide landowners compensation for the implementation of conservation practices, such as the placement of buffers along watercourses and the upgrading of feedlots. These practices can improve water quality, thus enhancing the water-based recreational opportunities of the water resource. The Becker County SWCD, watershed management-like organizations and the Becker County Lakes Improvement Association play a vital role in promoting such practices.

The County and DNR are primarily in charge of ensuring that important recreational waters are protected for water quality concerns. The DNR protects important waters through its Public Waters Inventory and also assists the County in enforcing shoreland regulations. These programs are described in depth within

this Plan.

3.5.13 Key Resources

Emergency Operations Center

The warning point for Becker County is located at the Becker County Sheriff's Office. The warning point supervisor is the Becker County sheriff and is responsible for notifying certain people upon receiving an emergency notification, sometimes through designated warning point officers located in towns across the county. People notified by telephone, radio, and television include those living in affected cities, people in private/public facilities, and rural residents. NOAA weather alert broadcast can also be heard. There is a tower located near Detroit Lakes. In addition, towers in Mahnomen, Fargo, Fergus Falls and Park Rapids also cover part of the Becker County area. The warning point also is responsible for notifying the Emergency Broadcast System.

The Emergency Operating Center (EOC) is located in the Becker County Law Enforcement Center in Detroit Lakes, Minnesota. The Becker County Courthouse serves as an alternate spot in case the law enforcement center is not usable. General duties of the EOC include coordination of response to the hazard, including volunteer help, communication to local/state/federal governments and agencies, communication with the National Weather Service during serious weather, and producing suitable information for public viewing. There are eighteen people that staff the EOC during a disaster, but staffing is on an as-needed basis. Supplies at the disposal of the EOC for an emergency include but are not limited to:

- Communication equipment - protected from electromagnetic pulses.
- 75-kW Generator - backup power for the EOC. Has an underground fuel tank. The alternate EOC has a 30-kW generator.
- Food - from privately owned food markets. Water is supplied by city mains.
- Extra supplies provided by county - paper, chairs, medical kits, and similar

Emergency Services

Becker County is served by 11 local fire departments, 6 ambulances, 6 First Responder Agencies, the Becker County Rescue Squad, as well as the Atwater Police, Detroit Lakes Police, and Becker County Sheriff's Office shown in Table 43.

Table 43: Emergency Services in Becker County

Jurisdiction	Law Enforcement	EMS	Fire
Becker Co.	Becker Co. Sheriff	St. Mary's Ambulance Service	
Detroit Lakes	Detroit Lakes Police	St. Mary's Ambulance Service	Detroit Lakes Fire
Callaway	Callaway Police	St. Mary's Ambulance Service	Callaway Fire
Ogema	Ogema Police	St. Mary's Ambulance Service	Ogema Fire
White Earth	White Earth Police	White Earth Ambulance	White Earth Fire
Carsonville	Becker Co. Sheriff	St. Mary's Ambulance Service	Carsonville Fire
Elbow/Tulaby	Becker Co. Sheriff	St. Mary's Ambulance Service	Elbow/Tulaby Fire
Hitterdal	Becker Co. Sheriff	St. Mary's Ambulance Service	Hitterdal Fire
Ulen	Becker Co. Sheriff	St. Mary's Ambulance Service	Ulen Fire
Park Rapids	Becker Co. Sheriff	North Ambulance	Park Rapids Fire
Lake Park	Lake Park Police	St. Mary's Ambulance Service	Lake Park Fire
Wolf Lake	Becker Co. Sheriff	St. Mary's Ambulance Service	Wolf Lake Fire
Frazee	Frazee Police	St. Mary's Ambulance Service	Frazee Fire
Audubon	Audubon Police	St. Mary's Ambulance Service	Audubon Fire

Healthcare

St. Mary's Regional Health Center and the Dakota Clinic in Detroit Lakes are available for use by all people injured during a hazard event. There are eighty-seven beds available, with four birthing rooms, two operating tables, and a twelve-bed woman's unit. Specialties include Family Practice, General Surgery, OB/GYN, Internal Medicine, Midwife Services, Radiology, and Podiatry. St. Mary's also has a home health office. According to the Economic Development Authority, it is the second largest employer in Detroit Lakes.

Dakota Clinic and Innovis Health is a medicare certified ambulatory care center. There are clinics located in both Frazee, Detroit Lakes, and Lake Park, as well as in several other communities in neighboring counties. The Dakota Clinic in Detroit Lakes is attached to the St. Mary's Regional Health Center.

A Merit Care clinic is also located in Detroit Lakes, one of twenty-seven offshoots of the Merit Care Hospital in Fargo/Moorhead. Merit Care Hospital in Fargo/Moorhead has 380 beds available and more than three hundred physicians. They are available for use in case of a large event in Becker County.

There is a public health clinic located in Ponsford and the White Earth Health Center is available for residents in and around the White Earth area. If additional facilities are needed, Veterans Hospital in Fargo and Perham Memorial Hospital in Perham can also be utilized.

Supervised Living:

-Emmanuel Community is a class A professional home care agency and an assisted living home care provider.
-Emmanuel Nursing Home has 140 beds available and new assisted living condos.
-Frazee Assisted Living provides housing with services. It is an assisted living home care provider
-The Frazee Care Center has 98 nursing home beds available. It is classified as a class A professional home care agency.
-Golden Manor Corporation is an assisted living home care provider.
-Lamplighter Manor provides housing with services
-Lincoln Park Assisted Living provides housing with services. There is also Lincoln Park Senior Apartments, also providing housing with services.
-Northstar Nursing Temporary Association Inc. is a class A professional home care agency.
-Smith Group Home Inc. has seven beds available. It is an intermediate care facility for the developmentally disabled.
-St. Mary's Continued Care is a class A professional home care agency.
-St. Mary's Regional Health Center has 100 nursing home beds available.
-Sunnyside Care Center is a nursing home with 61 beds available.
-West Home is a supervised living facility with nine beds for the mentally retarded.
-White Earth H.H.A. is a class A professional home care agency
-Winchester on Washington provides housing with services.

Air Support Services

The Civil Air Patrol can help in the location of missing people.

The National Guard can help assist any people that are stranded because of snowfall. For cases of need, rescue squads are available in the towns of Frazee, Lake Park, and Wolf Lake. Immediate medical attention can be paid by these rescue groups for victims with major or minor injuries.

Telecommunication Facilities

The media is one of sources that broadcast severe weather alerts for the county. By using multiple media sources, Becker County ensures that the maximum amount of people are warned about the upcoming severe weather.

Radio Stations:

KDLM in Detroit Lakes
KFGO in Fargo
KQWB in Fargo
KVOX in Moorhead
WDAY in Fargo
KRCQ in Detroit Lakes

TV Stations:

WDAY in Fargo
KXJB in Fargo

KTHI in Fargo
TV 3 in Detroit Lakes

Newspapers:
Detroit Lakes Tribune
Frazee Forum
Lake Park Journal
Lake Area Press

Telephone:
Qwest
Arvig
Loretel
Felton Telephone Company
Twin Valley-Ulen Telephone

Power Facilities

Minnesota has two nuclear power plants. These power plants are not located in Becker County or any of the surrounding counties. Although a release or accident with these plants would affect Becker County, however it is not considered a direct hazard. The Becker County EOP has a detailed section about what to do in the event of a nuclear or radiologic exposure, including the management of evacuees.

Companies that provide electricity to Becker County include Otter Tail Power Company, Wild Rice Electric Co-op, Lake Region Electric Co-op, Itasca-Mantrap Co-op and Todd-Wadena Electric Co-op. Detroit Lakes and Lake Park have their own municipal utility departments to provide power to their citizens.

Natural gas needs for most of the county are met by Aquilla. The regional office is located in Detroit Lakes. Lake Park has its own natural gas distribution system.

Water and sewer for city members are provided by the city that they live in. For rural residents, a permit can be obtained for a well and septic system.

Propane is supplied by Anglo-American, D-M Propane, Ferrell Gas, Cenex in Lake Park and the National Propane Company. Gasoline, ethanol and diesel fuel are provided by many gas/service stations that are located throughout the county.

For security reasons, individual plants and substations will not be mapped out. Please see the emergency management staff for more information about this topic.

Energy Sector

The Minnesota State Energy Sector Partnership was created in 2009 by the Governor's Workforce Development Council and is a statewide initiative to forge an integrated and demand-driven system of education, training, and support services in energy efficiency and renewable energy industries. MSESP is funded by a three-year, $6 million U.S. Department of Labor grant.

The Minnesota State Energy Profile indicates that Minnesota was ranked fourth in the nation in ethanol production capacity in 2013. Even though Minnesota is 21st in the nation in population in 2011, was 29th in residential per capita energy use despite its very cold winters. In 2013, approximately 46% of the electricity generated in Minnesota came from coal-fired electric power plants. Most of these plant's coal supply were transported by rail from Montana and Wyoming.

There are two nuclear power plants near Minneapolis-St. Paul, the Monticello reactor, and the Prairie Island I and II reactors, accounted for 21% of Minnesota's net electricity generation in 2013. Minnesota ranked seventh in the nation in net electricity generation from wind energy in 2013; its net generation was 8 million megawatt hours in 2013, an increase of 5.9% from 2012.

The following table outlines the most common heating fuel for houses and condos in Becker County.

Table 44: Heating Fuel for Households in Becker County

Type of Heating Fuel	Percentage of Households
Utility Gas	24.7%
Electricity	17.0%
Bottle, Tank or LP Gas	31.3%
Fuel oil, kerosene, etc.	14.7%
Wood	11.9%

Schools

There are seven school districts that provide knowledge to the residents of Becker County, including Detroit Lakes School District #22 (largest number of students), Frazee School District #23 (among the top 25 districts in the state of MN and also the largest), Lake Park-Audubon School District #2889, Waubun-Ogema #435 and Pine Point School District #25. There is also the Lake Agassiz Special Education Co-op. These schools provide superior education to community members that are enrolled in kindergarten through 12th grade.

Table 45: Schools in Becker County

Community	School				
	Elementary	Middle	High	Parochial	College
Detroit Lakes	Roosevelt Rossman	X	X		
Circle of Life	X	X	X	X	
Frazee	X	X	X		
Pine Point	X	X			
Lake Park/Audubon	X	X	X		

College Students

The Minnesota State Community and Technical College is located in Detroit Lakes. It is one part of a five-part regional college serving most of northwest Minnesota. The college is focused toward industry-related

technical and general education. Students graduating usually receive a certificate, diploma or associate degree in applied science.

Section 4: Risk Assessment

A risk assessment is critical to mitigation and comprehensive emergency management because it allows communities to measure and better understand the potential impact of hazards on their communities. Conducting a risk analysis is a multi-step process. The risk assessment process includes identifying hazards, profiling hazard events, determining how frequent hazards occur, and determining both the type and magnitude of hazard impact. A risk assessment provides the means for emergency managers and community leaders to develop mitigation actions, to prioritize resources needed to address operational activities, and to ultimately help a community become more resilient (Schwab, Eschelbach, and Brower, 2007).

FEMA Requirements Addressed in this Section:

§201.6(c)(2)(i): [The risk assessment shall include a] description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008, must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

§201.6(c)(2)(ii)(A): (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

§201.6(c)(2)(ii)(B): (B) An estimate of the potential dollar losses to vulnerable structures identified in … this section and a description of the methodology used to prepare the estimate.

§201.6(c)(2)(ii)(C): (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

§201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

4.1 Hazard Profile

The first step in conducting risk analyses is to identify which hazards are the most probable to impact one's community. With regard to Becker County's mitigation plan update, an all-inclusive list of hazards was considered for inclusion in the plan update. The Hazard Mitigation Planning Team reviewed several sources to include Becker County's previous hazard mitigation plan, hazards identified by FEMA (Multi-Hazard Identification and Risk Assessment), the Region's Threat Hazard Risk Analysis (THIRA), the Minnesota State Multi-Hazard Mitigation Plan, and mitigation plans of other neighboring counties. In addition to reviewing the region's mitigation plans, the Hazard Mitigation Planning Team analyzed past

declared disasters and spoke to local experts and residents. To elicit input from both officials and citizens, a survey was created and distributed to all of the participating jurisdictions.

While this iteration of the plan evaluated a wide variety of hazards, after careful analyses, receiving feedback from the public and approval of the steering committee, it was decided that this update would have several changes but would essentially remain the same. As suggested by the Hazard Mitigation Planning Team and approved by the Hazard Mitigation Steering Committee and upon receiving feedback from the citizens of Becker County and the MN HSEM, the following changes were made:

1. The risk assessment process would be updated to better align with the current standards.
2. Flood control structures were reclassified as Dam/Levee failure
3. The hazards of terrorism were eliminated from the plan. Becker County has other plans in place (such as the THIRA) which serve as the primary planning documents to address non-natural and political hazards.
4. Issues of blizzard, extreme precipitation blizzard, snow storms and ice storms were incorporated into severe winter storms
5. Thunderstorms were eliminated as issues of wind and lightning (both included hazards) accounted for this hazard
6. Earthquake was not profiled as it was decided the frequency and impact of an event on Becker County and the participating jurisdictions are negligible
7. The hazard of Fires (Structures and Vehicles) was added to the plan.
8. The hazard of Invasive Species was added to the plan.

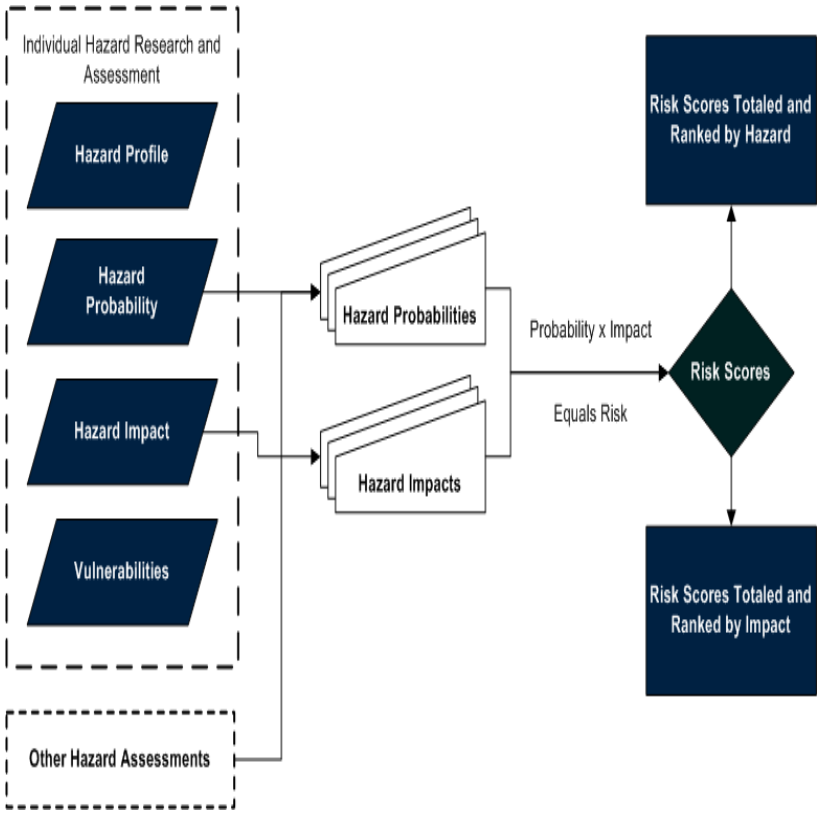
Table 46: provides a summary of the final hazards identified in the hazard risk assessment:

Natural Hazards	Natural Hazards	Technological Hazards
Flooding (riverine and flash flood)	Erosion	Hazardous Material Release
Dam / Levee Failure	Land Subsidence	Invasive Species
Wildfire	Drought	Infectious Diseases
Windstorms	Extreme Heat	Fires (Structures and Vehicles)
Tornadoes		Transportation Incidents
Hail		Ground and Surface Water Supply Contamination
Lightning		
Winter Storms		

4.1.1 Risk Assessment Process

At the most fundamental level, both DHS and FEMA recognize that risk is equal to frequency X consequence (R = FC) of a hazard. More specifically, the risk is based on the premise that in order to have a certain level of risk there must be a probability or likelihood of a hazardous event to occur. Likewise, if the event does occur, it must have an impact or consequence. The following section outlines the methodology used to determine Becker County's risk.

To assess hazards and determine risk, the planning team proposed that a methodology based on probability and impact be utilized. First, each hazard was researched, documented, and assessed for frequency and impact. Then, the hazard frequency and impacts were compiled for all of the individual hazard assessments. Once this data was compiled, the frequency and impact calculations were tabulated to obtain a matrix of risk scores. The risk methodology as highlighted above was presented to the steering committee during the December 10, 2014, steering/planning meeting.



4.1.2 Probability of Future Occurrences

The probability of future occurrences is commonly determined by using the frequency of past events to gauge the likelihood of future occurrences. In the case of Becker County, the hazard analyses and update was based on the County's historical data, the written record and information provided by citizens of Becker County, and input from participating jurisdictions. When possible, a 50-year period was used to determine the probability (note, not all hazards report 50 years of data). The data used for all the hazard probabilities can be found in Appendix B.

The method used in the Becker County's plan for standardizing the scale of probability values was based on the probability as shown below. The metrics for these classifications have been modified to reflect the 50-year reoccurrence interval used for this risk assessment and properly reflect the scale for the probabilities that was analyzed.

Table 47: Frequency/Probability

Frequency/Probability		
Level ID	**Description Index Value**	**Index Value**
Unlikely	Rare with no documented history of occurrences or events. Annual probability of less than 0.001	.5
Possible	Rare occurrences of at least one documented or anecdotal historic event. Annual probability that is between 0.01 and 0.001	1
Likely	Likely occurrences with at least two or more documented historic events. Annual probability that is between 0.1 and 0.01	2
Highly Likely	Highly Likely Frequent events with a well-documented history of occurrence. The annual probability that is greater than 0.1.	3

One issue to note is that hazard data is often reported regionally versus being isolated to a single community. When determining risk, regional reporting can present a challenge in that multiple communities are noted as being impacted versus individual cities or counties. For example, NOAA might report that a severe storm affecting the Southcentral part of Becker County while not directly indicating the city of Viking as being affected. As such, to ensure each jurisdiction (or in the example--- Viking) is accounted for a quadrant system was used.

The quadrant used in the Risk Analyses simply arranged Becker County and its cities into the regional reporting categories (Central Becker, Southcentral Becker, Northcentral Becker, Northwestern Becker, Southwestern Becker, Northeastern Becker, and Southeastern Becker). For tabulating hazards frequency, the following Regional Classification Table demonstrates which cities are associated with each jurisdiction.

Table 48: Regional Classification

Regional Classification	
Central	Unincorporated Becker County
Southcentral	Unincorporated Becker County
Northcentral	Unincorporated Becker County
East central	Unincorporated Becker County
West central	Unincorporated Becker County
Northwestern	Unincorporated Becker County
Southwestern	Audubon, Detroit Lakes, Frazee, Lake Park & Unincorporated Becker County
Northeastern	Unincorporated Becker County
Southeastern	Unincorporated Becker County

Note: The quadrant system was only used when the Hazard data used regional indications and did not directly indicate a community.

4.1.3 Hazard Impact

When conducting a risk analysis, creating a probability of a hazard occurrence is just one of several steps one must take to determine risk. To determine risk one must also take in account both impact assumption and impact magnitudes.

Impact assumptions describe how hazards impact the County and or its cities. The specific set of impact

assumptions listed below were selected for Becker County's hazard risk analyses. The listed impact assumptions were chosen as they 1) can be caused by several different hazard events; 2) are mostly independent of each other; 3) each can be (to certain degrees) mitigated; 4) are often cited in the disaster literature (Center Comprehensive Emergency Management Research. 2015). And 5) are commonly used in disaster planning.

Table 49: Impact Assumptions

Impact Assumptions	
Casualties/Trauma	Non-Critical injuries that require medical attention.
Communication, Lack thereof	Disruption of communication including mobile and wired phone, radio, television, and satellite.
Continuity of Government	Disruption of county government normal operations.
Debris	Dry, wet, hazardous, organic or inorganic materials that need to be cleared and properly disposed of.
Emergency Services Disrupted/Limited	Fire, Rescue, and Medical services are either overwhelmed or unable to respond normally.
Evacuation Needs	Hazardous conditions require the evacuation from either a specific site or larger area within the county.
Fatalities	Death due to the hazard.
Hazardous Material Release	Hazard event causes a hazard material release as a secondary hazard.
Overwhelm of First Responders	First responders are overwhelmed or unable to respond.
Mass Care Needs	Hazard event requires emergency sheltering of citizens.
Physical Damage / Asset Destruction	Loss or damage to the built environment.
Power, Disruption/Outages	Inability to supply power to end users or lack of enough power.
Transportation, Disruption/Failure	County roads, sidewalks, and public transit are obstructed or unable to function normally.
Economic Loss	Hazard causes loss or disruption to economic assets.

4.1.4 Impact Magnitudes

Disaster is loosely determined by when a jurisdiction's capacity is exceeded or when the jurisdiction no longer has the capacity to cope with the hazard. To quantify impact assumptions, it is necessary to determine the magnitude that hazard might have on a jurisdiction. The metric for impact magnitude consisted of a number of descriptors that are normally associated with a jurisdiction's capability and capacity to respond to, mitigate, and or recover from hazed events. A full list of these magnitude ratings is presented in the Impact Magnitude Rating table below.

Table 50: Impact Magnitude Ratings Descriptors

Impact Magnitude Ratings	
Rating	**Descriptors**
0	Hazard has no foreseeable effect specific to the impact assumption (rare).
1	The impact is present but is extremely light having relatively no notable adverse effect on the jurisdiction.
2	The impact has an effect on the Jurisdiction but does not always require next level government intervention.
3	Impact necessitates a county response or deployment of resources, impact disrupts normal/planned community functions.
4	Impact requires EOC operations or other coordinated response efforts.
5	The cost of impact exceeds a threshold of being unusually detrimental or disruptive to the Jurisdiction.
6	The impact is taxing on county's resources and has a widespread effect on the greater community.
7	The impact has an extended response / short-term recovery duration exceeding 36 hours and some long-term recovery needs.
8	Impact exceeds county and municipal response capabilities/capacities.
9	Long-term recovery planning needed, State or Federal resources needed to aid response and recovery from the impact.
10	The impact is so great it disrupts basic county function for an extended period of time and causes secondary hazards.

The final steps in calculating consequence (impact score) is to provide a magnitude of each impact. Once each impact is assigned a magnitude rating, the sums of each impact are added together and divided by 14 (the number of impact assumptions). The maximum impact score for each event could be 10 while the minimal score could be 0.

As noted by the steering committee during the December 5, 2013, meeting, the challenge with using this model is to quantify hazard impacts so that they use similar scales and are easily interpreted without inserting bias.

To account for bias, it was decided that once the data was calculated, it would be placed on a dedicated web page for open review and comment by the steering committee, participating jurisdictions, and public. The emergency manager was responsible for informing the public, steering committee and participating jurisdictions that the information was available for review and to provide comment. The hazard risk assessment with input occurring from each of the participating jurisdictions. In instances where the findings provided by the jurisdictions were inconsistent with the written record, the average of the two data sets was used to determine the County's hazard frequencies.

Table 51: Impact Descriptors

Impact		
Level ID	**Description Index Value**	**Index Value**
No Impact	No action required.	0
Low (Less than 3.33)	Minimal action required.	1
Moderate (3.34-7.45)	Action required with present resources.	2
High (7.5-10)	County resources are overloaded and additional help is required.	3

4.2 Risk

Risk Scoring Key	
0 – 3.23	Little To No Risk
3.24 - 5.49	Low Risk
5.5 - 7.74	Moderate Risk
7.75 - 9	High Risk

This section is a summary of risks and the factors that contributed to the overall risk score for each hazard. Data was derived from Becker County's past mitigation plan, readily available data (internet searches, disaster database), and records provided by Becker County and the participating jurisdictions. The individual hazard profiles were the basis that informed the hazard risk analysis process. The probability, impact and risk hazard event data was analyzed for each of the listed hazards and for each of the participating jurisdictions in the county.

To satisfy the risk equation proved earlier (i.e. Risk = Frequency X Consequence), a final risk score for each jurisdiction was generated. The risk was determined by multiplying the probability index number by the hazards consequence index number (i.e. Consequence = Impact Assumption X Impact Magnitude / 14). Risk scores range from 0-9 and are categorized as Little to No Risk (score of 0 to 3.23), Low Risk (score of 3.24 to 5.49), Moderate Risk (score of 5.5 to 7.74) and High Risk (score of 7.5 or higher). The table to the right summarizes the risk-scoring key.

To assist the reader in understanding how risk was determined an example is provided.

EXAMPLE: Over the past 50 years, hazard X occurred 40 times. From this information, it can be determined that this hazard is highly likely to reoccur and is recorded with a probability index score is equal to 3. Additionally, the hazard impact assessment suggests the hazard will have a moderate impact on the jurisdiction (70/14= 5) and as such the hazard's impact index score is equivalent to 2. The hazard risk score is calculated based on the probability (3) multiplied by the impact (2), to give an overall risk score of 6 or Moderate Risk.

It should be noted that because some select hazards were grouped, there might be inflation with regard to probability and impact. For example, severe summer storms include instances of hail, thunderstorms, and severe winds. Thus, the number of events and impact will rise causing the risk to also rise.

Another consideration is this model uses both the written record and record as reported by Becker County citizens. Therefore, there may be ambiguity with regard to occurrence and impacts provided in written record. Additionally, while some hazard events technically occur outside of the legal boundaries of a jurisdiction, the effect of these hazards are still felt by those living in the jurisdiction. Thus, it is common for participants to note hazards such as wildfire and or invasive species as having an impact on their respective jurisdictions regardless of that hazard technically occurring outside the boundaries of their legal jurisdiction. Finally, one must also consider the influence of perception when assessing a hazard's magnitude. For example, one might say an event was worse or less severe than officially reported. Such as the perception that a severe storm generated an actual tornado; however, in reality, the event generated severe, straight-line winds.

It should be noted that considerations such as these occur in all data analyses. However, such incommodes do not influence the overall purpose of mitigation or diminish the analyses. Matter of fact, It

can be argued that including both qualitative and quantitative data has made the model more accurate as it accommodates for risk perceptions and expertise of those living in Becker County.

4.2.1 Risk Findings

The hazard risk assessment requires information about what hazards have historically impacted the communities, past mitigation actions, current vulnerability, climate change, the relationship to other hazards and what hazards may present risks in the future. Identifying historical and potential future hazards were primarily accomplished in two phases. The first phase entailed interviewing local government officials and staff, local emergency planning and response staff, and the public. The second phase entailed researching government records and news publications for records of previous hazard events. The results of the initial hazard evaluation were used to further focus the risk assessment on hazards that historically caused the most problems and those judged to be of most future concern.

Using the frequency X consequence (R = FC) formula, each jurisdiction has its own unique risk score based on the 28 points of data. An overall score was provided as a means to show the overall risk to the participating jurisdictions as a whole. While the level of detail for each hazard correlates to the relative risk of each hazard, the risk is limited by the amount of data available. As additional information is discovered and or new hazards are identified, the plan can be easily adjusted and updated.

The hazards and corresponding jurisdictional risk are listed in order of risk. Each of the identified hazards presented below includes a description of the hazard, the risk of the hazard affecting the jurisdictions within Becker County, the vulnerability of the jurisdictions within Becker County, mitigation actions that have taken place in the past five years, and the relationship of the hazard to climate change and other hazards.

In January 2015, the final risk scores were posted on the project webpage and sent to the participating jurisdictions for review and comment. The Becker County Emergency Manager was responsible for ensuring that the Hazard Mitigation Steering Committee, jurisdictions, and the community at large were aware that the data was available for review.

4.3 Flood

Flood was identified in the prior hazard mitigation plan from May 2008 for Becker County and was identified as one of the hazards to be included in the Becker County Hazard Mitigation Plan update. Flood was identified as the most significant and number one hazard impacting Becker County in the prior May 2008 plan. Analyses are included in this Becker County Hazard Mitigation Plan update to include a more in depth look at what flooding is, the history of it within Becker County and the potential it has to impact the county residents. A definition of flooding is provided prior to taking a closer look at the effect flooding has on Becker County in order to provide the reader with knowledge of the hazard.

Flooding is the accumulation of water within a water body (e.g., stream, river, lake, or reservoir) and the overflow of excess water onto adjacent floodplains. Floodplains are lowlands, adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories (FEMA, 1997). There are a number of categories of floods in the U.S., including the following:

- Riverine flooding, including overflow from a river channel
- Flash Floods
- Fluctuating lake levels
- Coastal flooding on the North Shore of Lake Superior
- Debris flow

While there is no sharp distinction between riverine floods, flash floods, ice jam floods, and dam-break floods, these types of floods are widely recognized and may be helpful in considering the range of flood risk and appropriate responses. The most common type of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods of time. The cause of flooding in large rivers is typically prolonged periods of rainfall from weather systems covering large areas. These systems may saturate the ground and overload the rivers and reservoirs in numerous smaller basins that drain into larger rivers. Localized weather systems (i.e., thunderstorms) may cause intense rainfall over smaller areas, leading to flooding in smaller rivers and streams. Annual spring floods, due to the melting of snowpack, may affect both large and small rivers and areas.

A flash flood is defined as a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. (National Weather Service, 2012).

The definition of a flash flood per the Minnesota Climatology Working Group is “the occurrence of 6 inches or more rainfall within a 24 hour period.” The size of a flash flood is measured via area in square miles over which a 4-inch or more rainfall occurs. The rationale for using this criterion is that a rainfall of six inches in a 24-hour period will produce a river flow in equivalent to that in a the 100-year return period

in Minnesota and that 4-inch and greater rainfall generally leads to reports of increased erosion or other economic damages. Ice jam floods usually occur in the spring and are most likely to occur where the channel slope naturally decreases, when culverts freeze solid, in reservoir headwaters, near natural channel constructions (e.g., bends and bridges), and along shallows.

4.3.1 Flood Risk in Becker County:

The overall probability for that flooding will occur each year in Becker County is highly likely and its relative impact is moderate, and thus the overall risk for Becker County is moderate. The risk of flooding for each of the cities is different and was determined based upon the specific data collected and outlined in the history section of this hazard profile. In assessing flood data for the 2015 update, data from 2009 to 2014 was used to determine the risk for each of the cities and the county as a whole. Most notable are the cities of Ogema, Lake Park, Detroit Lakes and the unincorporated areas of Becker County because they are at a higher risk of flooding due to an extensive history of problematic flooding. The table provided below provides the name of each of the cities in the County, the probability that flooding will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 52: Flood Hazard Risk Assessment

Flood			
City	Probability	Impact	Risk
Audubon	Likely	Low	Little to No
Callaway	Likely	Low	Little to No
Detroit Lakes	Highly Likely	Moderate	Moderate
Frazee	Likely	Low	Little to No
Lake Park	Highly Likely	Moderate	Moderate
Ogema	Highly Likely	Moderate	Moderate
Wolf Lake	Likely	Moderate	Little to No
Becker County	Highly Likely	Moderate	Moderate
Total	Highly Likely	Moderate	Moderate

*The probability is based upon data available from 1997-2014

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents little change from the previous plan, as the overall risk is Moderate for the 2015 update. Similarly, the last plan update was done in May 2008 and indicated that flood had the potential to have a Substantial impact on Becker County and a significant threat is posed. This meant that the hazard was found to occur once every 5 years and could have a substantial impact on large areas of Becker County.

4.3.2 Flood History in Becker County:

The following information was provided by the September 2010 Polis Center Flood Analysis for Becker County Report. Historical flood events from this report indicated that from 2000 to 2010, 18 flood events were reported to the National Climatic Data Center (NCDC) for Becker County. The most costly flood event, in terms of property and crop damage, occurred from April 1 to April 7 across the county in 2006. Due to the quick snowmelt, water quickly drained into low areas, damaging many roads and bridges around the

county. Becker County received a Presidential Disaster Declaration for damages caused by spring flooding.

Another flood event due to heavy rainfall occurred from June 2 to June 30, 2002, over northwest Becker County led to flooding problems. Many roads, bridges, and fields across this area were damaged. The county received a Presidential disaster declaration.

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers across the United States. No data was available for Becker County.

The National Oceanic and Atmospheric Administration Climatic Data Center also provides data on storm events and the following 8 floods were listed from 1/1/2009 to 6/30/2015. The table below outlines the type of flood, location, deaths or injuries as well as property or crop damage incurred by the flood event.

Table 53: Flood Events for Becker County from NCDC

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	231.00K	230.00K
OGEMA	BECKER CO.	MN	03/22/2009	11:15	CST-6	Flood		0	0	5.00K	0.00K
OGEMA	BECKER CO.	MN	04/01/2009	00:00	CST-6	Flood		0	0	5.00K	0.00K
WHITE EARTH	BECKER CO.	MN	05/24/2010	09:15	CST-6	Flash Flood		0	0	10.00K	10.00K
DETROIT LAKES	BECKER CO.	MN	07/04/2010	00:45	CST-6	Flash Flood		0	0	200.00K	100.00K
OGEMA	BECKER CO.	MN	04/03/2011	14:03	CST-6	Flood		0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	05/01/2011	00:00	CST-6	Flood		0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/19/2011	05:45	CST-6	Flash Flood		0	0	4.00K	10.00K
EVERGREEN	BECKER CO.	MN	07/19/2011	06:45	CST-6	Flash Flood		0	0	2.00K	10.00K
LAKE PARK	BECKER CO.	MN	05/27/2012	06:19	CST-6	Flood		0	0	5.00K	100.00K
Totals:								0	0	231.00K	230.00K

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 included current issues related to flooding in Becker County. While these issues have mostly subsided those noted below remain problematic within the county**.**

Closed Basin Flooding

Closed basin lakes provide a threat to land and structures in north east and south west Becker County. Specific areas within the county are as follows:

- The continuous rise of Bad Medicine Lake had Forest Township extremely concerned. To date, twelve structures have been lost. The bluffs in the area could be at risk to subsidence if the lake reached a high enough level. There was evidence of small slumps in the past. Agricultural and forest land have also been lost.
- Cormorant Lake had been threatened by closed basin lake flooding. Several lake accesses had been ruined including accesses to Big, Middle and Little Cormorant Lakes. Roads and property have been damaged as well as an increase in shoreline erosion.
- Juggler Lake in Shell Lake Township had problems with flooding.

Blocked Drainage

Drainage in Becker County is frequently blocked by beaver dams. Overland flooding is more likely to occur with these structures blocking the natural flow. Log, sediment and ice jams can also occur. Bridges not constructed correctly or placed in the right position can also act as a filter, catching river debris and creating a dam. Specifically, sometimes a problem dam lies in a protected land area such as land belonging to the nature conservatory, so the dam cannot be removed easily. Round Lake Township also had beaver problems near Elbow Lake Road, beavers frequently cause drainage problems in many townships.

Culverts & Runoff

An excess of impermeable surfaces in a small area (paved roads, buildings) can increase runoff in Becker County. A saturated soil will also increase runoff as no water is able to be absorbed. Flooding (overland) can occur, as well as water contamination. While many of the culverts were repaired, culvert washouts are a problem for Becker County in the following areas:

- Culvert washouts occur on Frazee Road in Burlington Township.
- A culvert on 520th Ave. in Carsonville Township has washed out during high water events. A flooded culvert occurred in Sugarbush Township.
- Runeberg Township has many culvert washouts on the following roads: 560th Ave. North, 560th Ave. South, 145th St., 580th Ave. N and a low area with several culverts located south on 580th Ave. and 530th Ave., south of Highway 87 on Kettle Creek. There are at least fourteen culverts that need attention.
- -Excess precipitation conditions caused culverts to wash out in Spring Creek Township.
- Heavy rains have washed out culverts in Two Inlets Township in the past, causing road closures.
- Culverts plugin Osage Township, either from excess snow, water, ice or sediment from roads.
- Runoff washes out several areas near culverts in Evergreen Township.
- Culverts have been washed out in Hamden Township in 1993, 1997, 2000 and 2001. Repeated problems occur on the following routes: 280th St., 230th Ave., 220th Ave. and 215th Ave. South of 240th St.
- Localized flooding is seen in the fields in Pine Point Township during a moisture-laden spring.
- Agriculture in Becker County is affected by overland flooding.

4.3.3 Major Declared Disasters for Flood in Becker County:

Of the floods, there have been 14 floods in the last 50 years in Becker County, which has been declared a disaster by FEMA. These disasters were all major declared disasters, which is when the event is clearly more than state or local governments cannot handle alone. The beginning and ending date of the incident are included for these declared disasters, as well as information on the type of assistance program that was provided.

Table 54: Declared Disasters for Flood in Becker County

IH Program Declared	IA Program Declared	PA Program Declared	HM Program Declared	Declaration Date	Disaster Type	Title	Incident Begin Date	Incident End Date	Disaster Close Out Date	Declared County/Area
No	No	Yes	Yes	5/10/2011	DR	SEVERE STORMS AND FLOODING	3/16/2011	5/25/2011		Becker (County)
Yes	No	Yes	Yes	4/9/2009	DR	SEVERE STORMS AND FLOODING	3/16/2009	5/22/2009		Becker (County)
No	No	Yes	Yes	6/5/2006	DR	FLOODING	3/30/2006	5/3/2006	3/6/2014	Becker (County)
No	Yes	Yes	Yes	6/14/2002	DR	SEVERE STORMS, FLOODING, AND TORNADOES	6/9/2002	6/28/2002	4/25/2012	Becker (County)
No	Yes	Yes	Yes	5/16/2001	DR	SEVERE WINTER STORMS, FLOODING, AND TORNADOES	3/23/2001	7/3/2001	11/6/2013	Becker (County)
No	Yes	Yes	Yes	6/27/2000	DR	SEVERE STORMS AND FLOODING	5/17/2000	7/26/2000	4/25/2012	Becker (County)
No	Yes	Yes	Yes	4/8/1997	DR	SEVERE FLOODING, HIGH WINDS,SEVERE STORMS	3/21/1997	5/24/1997	6/7/2010	Becker (County)
No	No	Yes	Yes	8/18/1995	DR	SEVERE THUNDERSTORMS, WINDS, FLOODING, TORNADOES, AND HEAT	7/9/1995	7/14/1995	9/18/2001	Becker (County)
No	Yes	Yes	Yes	6/11/1993	DR	SEVERE STORMS, TORNADOES & FLOODING	5/6/1993	8/25/1993	3/11/2009	Becker (County)
No	Yes	Yes	Yes	4/22/1978	DR	STORMS, ICE JAMS, SNOWMELT & FLOODING	4/22/1978	4/22/1978	7/6/1984	Becker (County)
No	Yes	Yes	Yes	7/17/1975	DR	SEVERE STORMS, TORNADOES & FLOODING	7/17/1975	7/17/1975	11/6/1981	Becker (County)
No	Yes	Yes	Yes	6/10/1974	DR	HEAVY RAINS & FLOODING	6/10/1974	6/10/1974	4/18/1977	Becker (County)
No	Yes	Yes	Yes	4/18/1969	DR	FLOODING	4/18/1969	4/18/1969	4/15/1974	Becker (County)
No	Yes	Yes	Yes	3/22/1966	DR	FLOODING	3/22/1966	3/22/1966	6/5/1969	Becker (County)

4.3.4 Mitigation Actions in the Past Five Years in Becker County:

Mitigation actions for flooding from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for flooding was to reduce repetitive damage to roads by protecting roads from flooding and reducing closed basin flooding damage. The County also identified they would prevent agricultural flooding damage by diminishing crop damage from standing water. Another mitigation action was to address flooding damage by identifying at-risk structures and decrease flooding damage. While these general actions addressed specific areas and properties flooding in in county is cyclical and it is anticipated that during the next wet cycle that the aforementioned and other unforeseen structures will be at risk. This current update of the mitigation plan represents a continues focus on the inevitability of floods.

National Flood Insurance Program (NFIP):

While several of the mitigation strategies include elements of the NFIP, the county and participating jurisdictions' participation in the program is considered an action in and of itself. Thus, the following narrative describes the county's participating jurisdictions' involvement and future commitment to the program.

The NFIP is a federal program created by congress to mitigate future flood losses nationwide through sound community-enforced building and zoning ordinances, and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage caused by floods to buildings and their contents. Participation in the NFIP is based on an agreement between local communities and the federal government. The NFIP states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses.

In 1968, congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Federal Emergency Management Agency (FEMA) manages the NFIP and oversees the floodplain management and mapping components of the program. Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities.

According to the Federal Emergency Management Agency Community Status Book Report for Minnesota, Becker County as a county participates in NFIP, as well as the cities of Detroit Lakes and Frazee. The following information was provided by the Becker County Emergency Manager and outlines the NFIP claims for Becker County for 2015.

Table 55: NFIP Data

Losses	Total Paid	Average Pay	Data Type	As of Date	County Name	County Nbr
2	36,282.09	18,141.05	Non-mitigated Data	08/31/2015	BECKER COUNTY	005
2	76,404.70	38,202.35	Non-mitigated Data	08/31/2015	BECKER COUNTY	005
2	52,338.98	26,169.49	Non-mitigated Data	08/31/2015	BECKER COUNTY	005
2	15,246.98	7,623.49	Non-mitigated Data	08/31/2015	BECKER COUNTY	005
2	8,643.57	4,321.79	Non-mitigated Data	08/31/2015	BECKER COUNTY	005

There have been a number of long-term hazard mitigation measures through FEMA's Hazard Mitigation Grant Program (HMGP). The purpose of this program is to reduce the loss of life and property due to

natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. HMGP is available when authorized under a presidential major disaster declaration, in the areas of the State requested by the governor. The following chart shows the HMGP which has occurred in the last 5 years in Becker County along with the project title, amount, and other relevant data. There have been 11 projects which have been either focused on statewide efforts or efforts specific to Becker County related to flooding.

Table 56: Mitigation Projects for Flooding in Becker County

Date	Incident Type	Disaster Title	Project Type	Project Title	Project Description	Project Counties	Status	Sub-grantee	Project Amount	Cost Share Percentage
04/09/2009	Severe Storm(s)	SEVERE STORMS AND FLOODING	92.1: State Multihazard Mitigation Plan	2011 State Standard Mitigation Plan Revision and Review	The application for funding is for work to be done by Polis Center, UMD, MnGeo, and DNR on the revision of the state standard mitigation plan due to be approved by April 21, 2011, and work on the statewide flood assessment using HAZUS.-JMCCLOSK-06/16/2010 14:12 GMT To perform deobligation and closeout as per state letter dated 12/11/12-SPAROD-01/18/2013 21:13 GMT	STATE WIDE	Approved	Statewide	$115,947.00	75%
04/19/2010	Flood	FLOODING	700.1: Management Costs - Salaries ; 700.4: Management Costs – Supplies	DR-1900 State Management Costs	The state of Minnesota is requesting SMC for the management and administration of the HMGP for Minnesota.-JNELSO13-05/28/2010 19:46 GMT	STATE WIDE	Approved	Statewide	$93,668.00	100%
07/02/2010	Tornado	SEVERE STORMS , TORNADOES, AND FLOODING	601.1: Generators	Perham 5% Initiative Generator Project	Install emergency backup generator in the City of Perham for the City Hall to ensure continuity of emergency services in time of severe weather and other disaster events.-JNELSO13-10/05/2011 20:29 GMT	BECKER; OTTER TAIL	Approved	Perham	$33,174.00	75%

07/02/2010	Tornado	SEVERE STORMS, TORNADOES, AND FLOODING	700.1: Management Costs - Salaries; 700.2: Management Costs - Equipment; 700.4: Management Costs – Supplies	State Administrative Costs		STATE WIDE	Approved	Statewide	$206,828.00	100%
10/13/2010	Severe Storm(s)	SEVERE STORMS AND FLOODING	700.1: Management Costs - Salaries; 700.4: Management Costs – Supplies	State Management Costs	State Management Costs-JMCCLOSK-02/11/2011 19:43 GMT	STATE WIDE	Approved	Statewide	$206,482.00	100%
10/13/2010	Severe Storm(s)	SEVERE STORMS AND FLOODING	92.1: State Multihazard Mitigation Plan	Minnesota 2014 Hazard Mitigation Plan Update	Update state of Minnesota all hazard mitigation plan to meet FEMA requirements.-JNELSO13-04/13/2012 15:49 GMT	STATE WIDE	Approved	Statewide	$168,665.00	75%
05/10/2011	Flood	SEVERE STORMS AND FLOODING	700.1: Management Costs - Salaries; 700.2: Management Costs - Equipment; 700.4: Management Costs – Supplies	State Management Costs	Administer and Manage grant activities under the Hazard Mitigation Grant Program for DR-1982-JRUSSEL4-02/23/2012 19:53 GMT manage grant through end of cycle.-JNELSO13-08/31/2012 20:17 GMT	STATE WIDE	Approved	Statewide	$151,811.00	100%
07/28/2011	Severe Storm(s)	SEVERE STORMS, FLOODING, AND TORNADOES	700.1: Management Costs - Salaries; 700.2: Management Costs - Equipment; 700.4: Management Costs –	State Management Costs	Conduct State oversight and management of Hazard Mitigation Grant Program funding-JRUSSEL4-02/24/2012 17:41 GMT	STATE WIDE	Approved	Statewide	$105,852.00	100%

			Supplies							
07/06/2012	Severe Storm(s)	SEVERE STORMS AND FLOODING	91.1: Local Multihazard Mitigation Plan	Becker County Hazard Mitigation Plan Update	Becker County will update their Hazard Mitigation Plan.-JNELSO13-04/25/2013 18:27 GMT	BECKER	Approved	Becker (County)	$33,326.00	75%
07/06/2012	Severe Storm(s)	SEVERE STORMS AND FLOODING	700.1: Management Costs – Salaries	State Management Costs – Amendment	This is a test application - DO NOT PROCESS-RRICKART-02/12/2013 19:53 GMT State Management Costs -JNELSO13-03/12/2013 18:16 GMT	STATE WIDE	Approved	MINNESOTA DEPARTMENT OF PUBLIC SAFETY	$326,498.00	100%
07/21/2014	Flood	SEVERE STORMS, STRAIGHT-LINE WINDS, FLOODING, LANDSLIDES, AND MUDSLIDES	700.1: Management Costs - Salaries; 700.2: Management Costs - Equipment; 700.3: Management Costs - Office Space Rental; 700.4: Management Costs – Supplies	State Management Costs	funds to administer disaster-related activities, including staff time, travel, lodging and indirect cost rate.-JNELSO13-12/01/2014 19:27 GMT	STATE WIDE	Approved	Statewide	$47,850.00	100%

4.3.5 Vulnerability in Becker County:

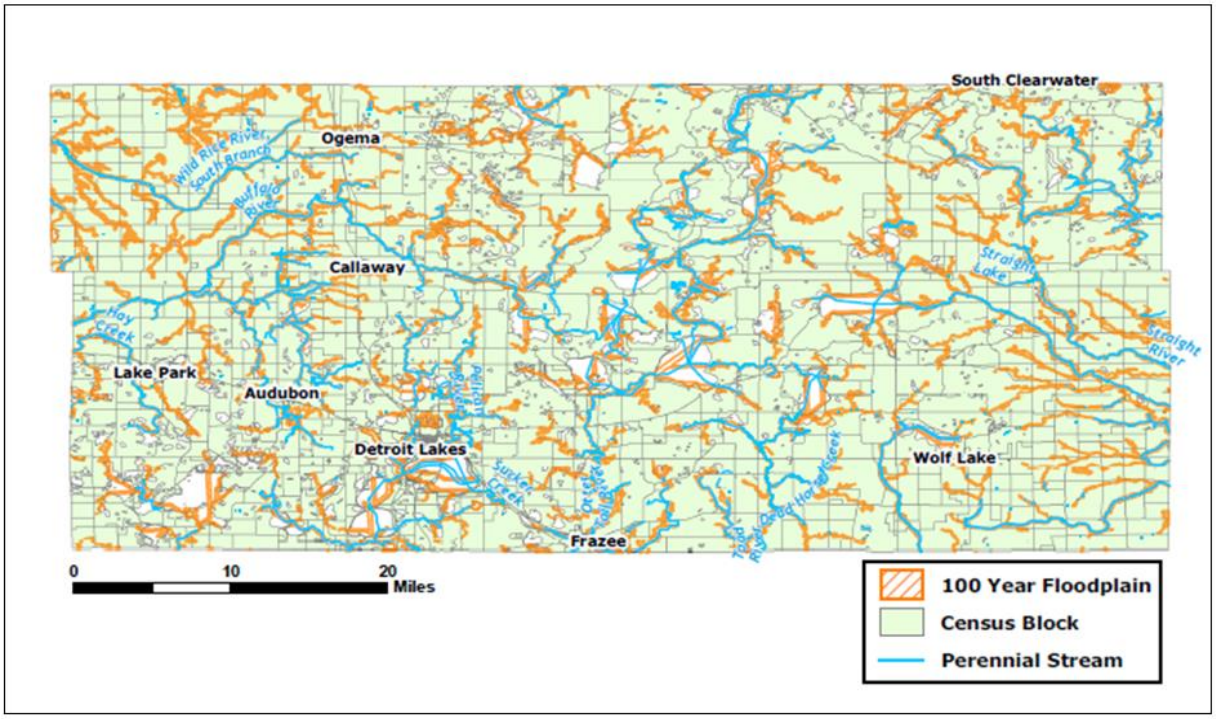
There is much vulnerability which exists in Becker County with regards to flood hazards. Structures and populations which lie within the floodplain in Becker County are at an increased risk of damage or loss of property because of flooding. Anyone living near a waterway is also at an increased risk especially in the springtime when there is the potential for heavy rain and sudden snowmelt. Any properties with improperly maintained flood control structures or property located in low elevations are also at an increased risk.

Flood analysis for Becker County was performed using HAZUS-MH MR4 released in August 2009 and was provided as part of the Polis Center Flood Analysis Report. The bundled aggregated general building stock

was updated to Dun & Bradstreet 2006. Building valuations were updated to R.S. Means 2006. Building counts based on census housing unit counts are available for RES1 (single-family dwellings) and RES2 (manufactured housing) instead of calculated building counts. The site specific inventory (specifically Schools, Hospitals, Fire Stations and Police Stations) was updated using the best available statewide information.

HAZUS-MH was used to generate the flood depth grid for a 100-year return period calculated for 1 square mile drainage areas. The riverine model was determined from a user provided USGS 30m DEM and peak discharge values obtained for 1 reach tabulated in the 1986 Becker County Flood Insurance Study.
The following map is the Becker County HAZUS-MH Analysis 100-year Flood Boundary Map. This map was created by the Polis Center as part of the Flood Analysis for Becker County as part of the Minnesota Pre-Disaster Mitigation Plan.

Figure 15: Becker County 100-Year Flood Map



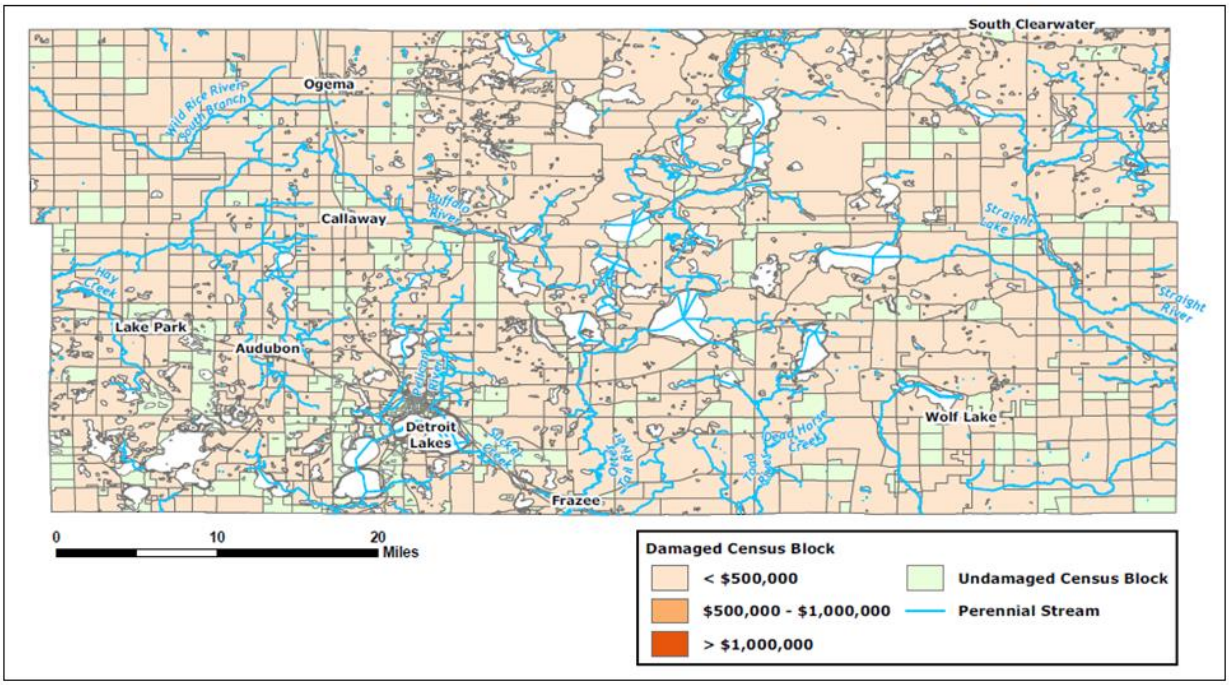
HAZUS-MH was used to estimate the damages incurred for a 100-year flood event in Becker County. An estimated 2 buildings will be damaged totaling $5.1 million in building losses and $14 million in total economic losses. The total estimated number of damaged buildings, total building losses, and estimated economic losses are shown in the table below.

Table 57: Becker County Total Economic Loss - 100-Year Flood

General Occupancy	Estimated Total Buildings	Total Damaged Buildings	Total Building Exposure X 1000	Total Economic Loss X 1000	Building Loss X 1000
Agricultural	159	0	$38,309	$591	$119
Commercial	755	0	$392,169	$4,782	$1,187
Education	23	0	$42,466	$193	$23
Government	34	0	$24,358	$406	$32
Industrial	237	0	$101,366	$1,903	$519
Religious/Non-Profit	70	0	$43,841	$1,274	$158
Residential	19,255	2	$1,843,959	$4,804	$3,089
Total	**20,533**	**2**	**$2,486,468**	**$13,953**	**$5,127**

HAZUS-MH estimates 1census block with losses exceeding $1 million. The distribution of losses is shown in Figure 16.

Figure 16: Becker County Total Economic Loss - 100-Year Flood



The reported building counts should be interpreted as degrees of loss rather than as exact numbers of buildings exposed to flooding. These numbers were derived from aggregate building inventories which are assumed to be dispersed evenly across census blocks. HAZUS-MH requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If

only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses.

The Polis Center Flood Analysis Report for Becker County also included information about essential facilities. Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station will no longer be able to serve the community). The HAZUS-MH analysis identified no facility that may be subject to flooding. None of the essential facilities included in the HAZUS-MH analysis fall within the flood boundary.

With regards to shelter requirements, HAZUS-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS-MH also estimates those displaced people that may require accommodations in temporary public shelters. The model estimates 411 households may be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these 292 people (out of a total population of 30,000) may seek temporary shelter in public shelters.

According to the Federal Emergency Management Agency (FEMA) the communities in Becker County which participate in the National Flood Program are Becker County, City of Detroit Lakes and the City of Frazee. The other communities in Becker County are not participating in NFIP, which means they do not have FEMA mapped high flood risk areas.

The following communities in Becker County are participants of the National Flood Insurance Program.

Table 58: Communities in Becker County Participating in NFIP as of January 5, 2015

Community	Community ID	P, N or O	Participating?	Initial FHBM	Initial FIRM	Current Eff Map Date
Becker County	270639	P	Participating in NFIP	3/18/1977		(NSFHA)
Detroit Lakes, City of	270564	P	Participating in NFIP	1/31/1975	8/19/1986	8/19/1986
Frazee, City of	270570	N	Not Participating in NFIP	11/15/1974	-	11/15/1974

4.3.6 Flood and Climate Change in Becker County:

The Minnesota All Hazard Mitigation plan stated that as Minnesota's climate changes, the quantity, and character of precipitation is changing. Average precipitation has increased in the Midwest since 1900, with more increases in recent years. According to the Draft National Climate Assessment (NCA), the Midwest has seen a 45% increase in very heavy precipitation (defined as the heaviest 1% of all daily events) from 1958 to 2011. This precipitation change has led to increased magnitude of flooding.

4.3.7 Relationship to other Hazards in Becker County:

Flooding is related to various other hazards such as severe storms because severe and/or slow moving thunderstorms and spring snow melt can contribute to flooding and under the right conditions can cause flash flooding. Flooding can also be related to dam failure because flood events have the potential to compromise the structural integrity of dams, which could lead to more severe flood events. Flooding can be related to infectious disease because wastewater spills are a possible consequence of flooding. Public

health can be affected because the incidence of infectious diseases can increase with wastewater spills.

4.4 Hail

Hailstorms were not identified in the prior hazard mitigation plan from May 2008 for Becker County as a separate hazard but were included as part of the "Summer Storms" risk profile. Hailstorms were identified as one of the hazards to be included in this 2015 plan update. Analyses are included in the 2015 plan update to include an in-depth look at what hail is, the history of it within Becker County and the potential are has to impact the county residents. A definition of hail is provided prior to taking a closer look at the effect hail has on Becker County in order to provide the reader with knowledge of the hazard.

A hailstorm is an outgrowth of severe thunderstorms and develops within an unstable air mass. Warm moist air rises rapidly into the upper atmosphere and subsequently cools, leading to the formation of ice crystals. These are bounced about by high-velocity updraft (or strong) winds and accumulate into frozen droplets, falling as precipitation after developing enough weight (FEMA, 1997).

Hailstorms cause millions in property, livestock, and crop damage each year. Severe hailstorms cause considerable damage to buildings, automobiles, and airplanes. Significant property damage does not occur until hailstone size reaches about 1.5 inches in diameter. This size will cause damage to cars, windows, and siding. When hailstones get larger and approach three inches in diameter, roofs start to experience major damage. Combined property and crop damage annual totals for recent years in Minnesota were $2.4 million (2012), $817,000 (2011), and $11.5 million (2010) (NCDC).

The National Weather Service (NWS) defines severe thunderstorms as those with downdraft winds in excess of 58 miles an hour and/or hail 1 inch in diameter or greater. While only about 10% of thunderstorms are classified as severe, all thunderstorms are dangerous because they produce numerous dangerous conditions, including one or more of the following: hail, strong winds, lightning, tornadoes, and flash flooding. The land area affected by individual hail events, an average of 15 miles in diameter around the center of the storm, is similar to the area affected by the parent thunderstorm. Hail risk at a point or over an area is a function of the target at risk (property or crop) and the hailing frequency, intensity, and size.

The size of hailstones varies and is a direct consequence of the severity of the thunderstorm. Hail quarter size (1 inch in diameter) or larger is considered severe. Hailstorms occur most frequently during the late spring and early summer when the jet stream moves northward across the Great Plains. During this period, extreme temperature changes occur from the surface up to the jet stream, resulting in the strong updrafts required for hail formation.

4.4.1 Hail Risk in Becker County:

The overall probability that hail will occur each year in Becker County is highly likely and its relative impact is Moderate and thus, the overall risk for Becker County is Moderate. The risk for hail for each of the cities is different based on the data available by individual city. In assessing hail data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that hail will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings. Most notable are the cities of Audubon, Callaway, Detroit Lakes, Frazee, Lake Park, Wolf Lake and unincorporated Becker County which all have a highly likely probability that hail events will occur each year.

Table 59: Hail Hazard Risk Assessment

Hail			
City	Probability	Impact	Risk
Audubon	Highly Likely	Moderate	Moderate
Callaway	Highly Likely	Moderate	Moderate
Detroit Lakes	Highly Likely	Moderate	Moderate
Frazee	Highly Likely	Moderate	Moderate
Lake Park	Highly Likely	Moderate	Moderate
Ogema	Likely	Low	Little to No
Wolf Lake	Highly Likely	Low	Moderate
Becker County	Highly Likely	Low	Moderate
Total	Highly Likely	Moderate	Moderate

4.4.2 Hail History in Becker County:

According to the 2014 Minnesota All-Hazard Mitigation Plan, in Minnesota, between 2008 and 2012 the month with the most hail was July, with August next. During these three months, 81% of the hail occurred; May had 32%, July had 28%, and June had 21%. The size of the hail reported is generally in the pea to the dime-sized category, with several reports annually of baseball-size and larger.

The National Oceanic Atmospheric Administration (NOAA) provided the history of hail events in Becker County. From 2009 to 2014, there have been 34 recorded events of severe hail events in Becker County, which can be seen in the table below. Of these 34 hail events, the city which has had the most occurrences of hail from 2009-2014 was Detroit Lakes with five events, Lake Park, and Callaway were next with four hail events each. The largest reported hail size was 2.5 inches was reported in Callaway on 5/24/2010 and Detroit Lakes on 6/19/2012.

Table 60: Hail History in Becker County from 2009-2014 from NOAA

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	05/24/2010	06:43	CST-6	Hail	2.50 in.	0	0	0.00K	0.00K
AUDUBON	BECKER CO.	MN	05/24/2010	06:44	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	07/17/2010	10:31	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/12/2011	18:00	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/19/2011	00:20	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	06/17/2012	18:40	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
AUDUBON	BECKER CO.	MN	06/19/2012	14:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/19/2012	14:19	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K

DETROIT LAKES	BECKER CO.	MN	06/19/2012	14:24	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	06/19/2012	14:25	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	06/19/2012	14:25	CST-6	Hail	2.50 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	06/19/2012	14:30	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	06/19/2012	14:36	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	06/19/2012	15:10	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	07/02/2012	18:08	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	07/22/2012	19:04	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	07/22/2012	19:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WOLF LAKE	BECKER CO.	MN	07/22/2012	19:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/24/2012	22:40	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TAMARAC REFUGE	BECKER CO.	MN	05/18/2013	18:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
PINE PT AGENCY	BECKER CO.	MN	05/18/2013	18:33	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/20/2013	19:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	06/20/2013	21:10	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2013	21:13	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2013	21:55	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/25/2013	23:08	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/25/2013	03:55	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	08/26/2013	17:26	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/31/2013	15:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TAMARAC REFUGE	BECKER CO.	MN	08/31/2013	18:53	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	07/05/2014	22:33	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	07/06/2014	00:05	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/06/2014	00:25	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	09/01/2014	16:40	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

4.4.3 Mitigation Actions for Hail in Past Five Years in Becker County:

Beyond basic education and forecasting, there were no mitigation actions specified for hail in the May 2008 mitigation plan for Becker County. As hail is difficult to mitigate against, education and forecasting remains the focus of the most current planning efforst.

4.4.4 Vulnerability of Jurisdictions within Becker County:

Becker County has numerous outdoor recreational opportunities throughout the summer months which draw large groups of people who are not residents of the county. Becker County has many wildlife management areas as well as part of Itasca State Park located within the county lines. The Becker County fair is held every year at the fairgrounds in Detroit Lakes. There is a grandstand upon the property, as well as bathrooms, electricity, and many buildings/barns.

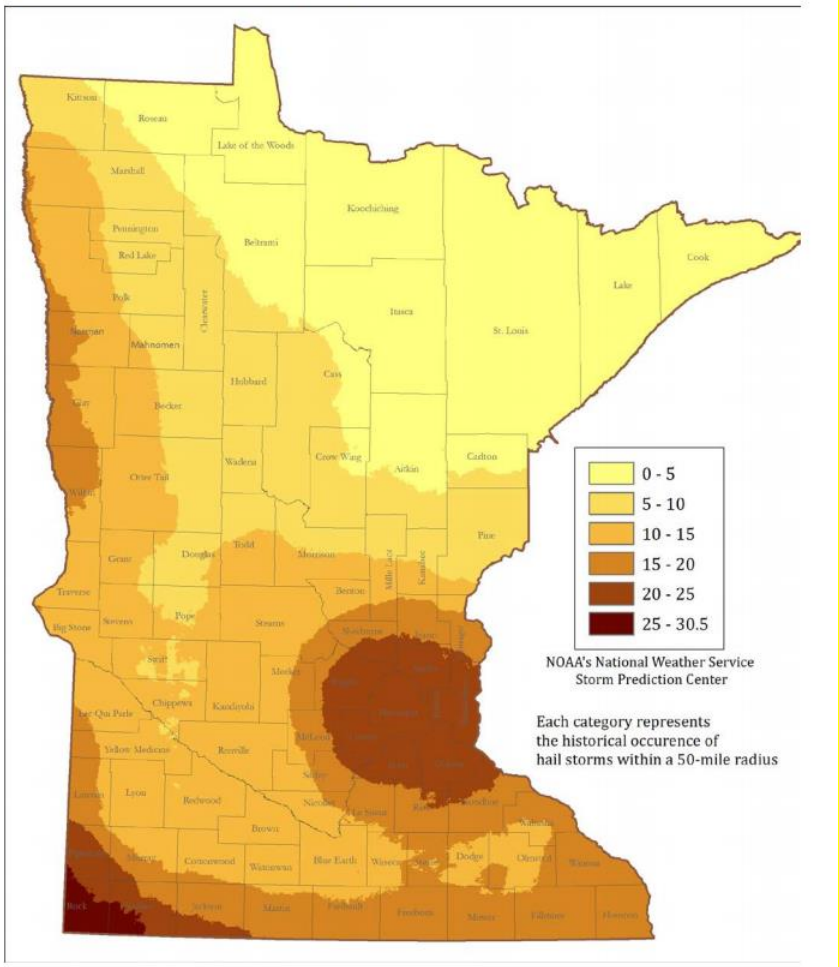
Becker County also has several annual events that draw a huge crowd including WE Fest (a three-day event with 50,000 to 60,000 people a day), Spirit Fest (a three-day event with 15,000 people a day) and the 10,000 Lakes Festival. These attractions are all held at the Soo Pass Ranch and WE Fest amphitheater.

The following figure was provided by the 2014 Minnesota All-Hazard Mitigation Plan and depicts the severe hail event frequency by county, from 1955 to 2012. The figure shows that in Becker County, the west portion of the county has experienced 10-15 severe hail events. The eastern portion of the county has experienced 5-10 severe hail events. This indicates the west portion of Becker County is at an increased risk. In addition, the data provided from the National Oceanic Atmospheric Administration indicated that the cities of Detroit Lakes, Callaway and Lake Park all are at an increased risk of hail events with an extensive history.

The storm frequency maps were created using a GIS density estimation technique. This is sometimes known as a "hotspot" analysis. The GIS tool "smooth's" the data from discrete points to capture important patterns while leaving out noise or other fine-scale phenomena. While storms are recorded as discrete events at a particular point in space, their frequency in a region does not actually abruptly change at a county line. The frequency maps were created by using a circular "kernel" of data, continuously across a dataset, to calculate the "density" of storms in every "kernel". The result is a continuous surface of data, illustrating the high and low frequency of storms over a period of time.

Figure 17: Hail Event Frequency by County

Figure 36 Severe Hail Event Frequency, 1955-2012



The vulnerability of damage due to hail is statewide. The vulnerability ranking was also included in the 2014 Minnesota All-Hazard Mitigation Plan for each county in the state. The impact of Extreme Damage Due to Hail shows that impact due to one event may be very large. The assumption for ranking is that given the same size hail event the building exposure is the determining factor in determining vulnerability.

- High – building exposure over $3 billion.
- Medium – building exposure is less than or equal to $3 billion but exceeds $1 billion.
- Low – building exposure is less than or equal to $1 billion.

According to the 2014 Minnesota All-Hazard Mitigation Plan, Becker County had an average of 9.91 hail events per year with a total of $2,486,468,000 in building exposure. Overall, Becker County is ranked Medium for hail vulnerability.

4.4.5 Hail and Climate Change in Becker County:

According to the Draft National Climate Assessment (NCA), winter storms have increased slightly in frequency and intensity, and their tracks have shifted northward over the U.S. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain (NCA, 2013, p. 26). Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (NCA, 2013, p. 59). The

occurrence of very heavy precipitation has increased in Minnesota in recent decades and future projections also indicate this will continue (Interagency Climate Adaptation Team, 2013, p. 14). While it is unknown if this precipitation will occur during severe storms that produce hail, the possibility has not been ruled out.

4.4.6 Relationship to Other Hazards:

Hail is related to summer storms and tornadoes as hail can occur as part of one of these other natural hazards and has a higher likelihood of occurring in the summer months in Becker County.

4.5 Winter Storms

Winter storms were identified in the prior Hazard Mitigation Plan from May 2008 for Becker County and were identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what winter storms are, the history of them within Becker County and the potential they have to impact the county residents. A definition of winter storms from is provided prior to taking a closer look at the effect winter storms have in Becker County in order to provide the reader with knowledge of the hazard.

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms, and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injuries such as frostbite and death. In the Midwest, Canadian and Arctic cold fronts that push snow and ice deep into the interior region of the United States cause severe winter storms. Severe winter storms can shut down highways, down power lines, take down trees and tree limbs, create hazardous driving conditions, hypothermia, fires from personal heating units such as heated blankets, flooding, and deaths to the young and elderly who can be exposed to the severe weather for prolonged periods of time. Blizzards are the most severe form of winter storms and are associated with large amounts of falling or blowing snow with wind gusts in excess of 35 mph. When these types of conditions exist the National Weather Service may issue a “Blizzard Warning”, or if such storm is expected, they may issue a “Winter Storm Watch”.

Severe winter storm occurrences tend to be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists, bicyclists, and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communication towers. Severe storms can cause the disruption of telecommunications and power for days. Heavy snow or accumulated ice can also isolate people from assistance or services. The National Weather Service issues a Wind Chill Advisory for Minnesota when widespread wind chills of -40°F or lower with winds of at least 10 miles per hour (mph) expected. In some parts of southern Minnesota, the threshold may be -35°F. A Wind Chill Warning is issued when widespread wind chills of -40°F in northern Minnesota and -35°F in southern with winds greater than 10 mph are expected.

The National Weather Service can be credited with providing at least 48 hours forewarning of a severe winter storm. This can give time for residents and governments to prepare for the storm such as stockpiling resources, prepping snow-moving equipment, and making plans. The NWS Warning Terminology Table breaks down the different types of advisories, watches, and warnings and when they are used.

Table 61: NWS Warning Terminology Table

National Weather Service Warning Terminology	
Winter Weather Advisory	Alert for ice, cold weather, or snow that can range from 2 - 6 inches.
Winter Storm Watch	Alert for severe winter weather with a high possibility in the next few days resulting in high accumulations of snow or ice.

Winter Storm Warning	Severe weather (ice, snow, cold) are about to begin or have already started.
Blizzard Warning	Snow condition resulting in high winds, snowdrifts, lack of visibility, and threatening conditions when traveling and to those exposed to the weather.
Ice Storm Warning	High accumulations of ice that will cause dangerous travel and problems to power infrastructure.
Heavy Storm Warning	Snow accumulation of 6 or more inches.

The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. Therefore, the wind makes it feel much colder. If the temperature is 00 F and the wind is blowing at 15 mph, the wind chill is -19 F. At this wind chill temperature, exposed skin can freeze in 30 minutes. The National Weather Service issues a Wind Chill Advisory for Minnesota when widespread wind chills of -40 F or lower with winds at least 10 miles per hour (mph) are expected.

4.5.1 Severe Winter Storms Risk in Becker County:

The overall probability that winter storms will occur each year in Becker County is highly likely, its relative impact is moderate, and thus, the overall risk for Becker County is moderate. The risk for severe winter storms for each of the cities is the same because data was not available by individual city. In assessing severe winter storm data for the 2015 update, data from 2009 to 2014 was used to determine the risk for each of the cities and the County as a whole. The risk for severe winter storms for each of the cities is based on the data provided by the National Oceanic Atmospheric Administration, which was broken up, by East and West Becker County. *Note: The cities in the County which are in West Becker County are Detroit Lakes, Frazee, Callaway, Audubon, Lake Park and Ogema. The city in East Becker County is Wolf Lake. The table provided below provides the name of each of the cities in the County, the probability that winter storms will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 62: Severe Winter Storms Risk by City in Becker County

Severe Winter Storms			
City	**Probability**	**Impact**	**Risk**
Audubon	**Highly Likely**	**Moderate**	**Moderate**
Callaway	**Highly Likely**	**Moderate**	**Moderate**
Detroit Lakes	**Highly Likely**	**Moderate**	**Moderate**
Frazee	**Highly Likely**	**Moderate**	**Moderate**
Lake Park	**Highly Likely**	**Moderate**	**Moderate**
Ogema	**Highly Likely**	**Moderate**	**Moderate**
Wolf Lake	**Highly Likely**	**Moderate**	**Moderate**
Becker County	**Highly Likely**	**Moderate**	**Moderate**

Severe Winter Storms			
City	Probability	Impact	Risk
Total	Highly Likely	Moderate	Moderate

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents a change from the previous plan. The 2015 update indicated winter storms have a moderate impact and moderate risk potential for Becker County. Whereas, the last plan update was done in May 2008 indicated that winter storms had the potential to have a limited impact on Becker County and a significant threat is posed. This meant that the hazard was found to occur every year and could have limited impact on the overall county of Becker.

4.5.2 Winter Storms History in Becker County:

Severe winter storms occur each winter season in Becker County. The types of winter storm events that are reported for Becker County include blizzard, severe cold, ice storms and severe snowfall as provided by the National Oceanic Atmospheric Administration. Some of the most notable severe winter storms in Becker County occurred in 2014. In the month of January in 2014, there were blizzards reported in Becker County in the Western part of the County on January 3, and January 16. There was a blizzard reported in Becker County in the Eastern part of the county on January 22 and across the entire county on January 26. During this one-month span in 2014, there were four blizzards reported.

National Oceanic Atmospheric Administration (NOAA) provided the history of severe winter storm events in Becker County. From 2009 to 2014, there have been 81-recorded events of severe winter storms in Becker County. Noting the frequency of severe winter storms in the region, most of the residents understand the dangers and have adapted to their reality. However, continued education and forecasting are critical and remain a priority regarding this iteration of the mitigation plan. A comprehensive list of the last 50 years of data can be found in Appendix B.

Previous Problems

The previous Hazard Mitigation Plan from May 2008 for Becker County indicated that power loss was a problem associated with winter storms. Loss of power during extreme temperature weather is a concern of Cormorant Township for both property and residents. As such, system redundancy for both critical resources and private citizens remains a focus of this iteration of the mitigation plan.

Disaster Declarations

Of the aforementioned severe winter storms, there has been one severe winter storm in the last 50 years in Becker County, which has been declared a disaster by FEMA. This was a major declared disaster, which is when the event is clearly more than state or local governments can handle alone.

Table 63: Major Declared Disasters for Severe Winter Storms

IH Program Declared	IA Program Declared	PA Program Declared	HM Program Declared	Declaration Date	Disaster Type	Title	Incident Begin Date	Incident End Date	Disaster Close Out Date	Declared County/Area
No	No	Yes	Yes	1/16/1997	DR	SEVERE WINTERSTORMS	1/3/1997	2/3/1997	3/21/2000	Becker (County)

4.5.3 Mitigation Actions for the Past Five Years in Becker County:

Mitigation actions for Severe winter storms from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for Severe winter storms was to assess deter long-term electrical disruptions by assessing infrastructure power concerns, working with local power companies, co-ops and utilities and reducing east/west power line vulnerability.

4.5.4 Vulnerability in Becker County:

According to the 2014 Minnesota All Hazard Mitigation Plan, the topography, land-use characteristics and severe winter climate of western and southern Minnesota cause this area to be particularly vulnerable to blowing and drifting snow. For an average winter season, taxpayers in Minnesota spend approximately $100 million in snow removal costs, with Minnesota Department of Transportation expending $41 million. In the event of a severe winter season with anomalously high snowfall and exceedingly strong winds, as was the case for much of the state during the winter of 1996-97, the cost of snow removal can soar to $215 million. Transportation systems, electrical distribution systems, and structures are vulnerable to winter storms throughout the entire state. These vulnerabilities impact human safety, disrupt distribution of government services, cause economic disruptions and damage structures.

Transportation systems in Becker County that have the potential to be impacted by severe winter weather are airports and roadways. There are one public and numerous private airports in Becker County that could potentially be impacted and prevent flights from coming in or going out in the event of a Severe winter storm. Roadways can be treacherous or impassable during severe winter storms making it difficult for individuals to get essential items such as food and medical care. It can also make it difficult for emergency vehicles to get to those people who are experiencing some type of emergency during a severe winter storm.

Severe ice or snowstorms can disrupt telecommunications and power for days. Such storms can also cause exceptionally heavy snowfall that persists for days, resulting in heavy flooding. The most prevalent impacts of heavy accumulations of ice or snow are slippery roads and walkways that lead to vehicle and pedestrian accidents. In addition, heavy snow loads can cause roofs to collapse trees and limbs to break as well as damaged telephone poles and lines, electrical wires, and communication towers. Children and the elderly are also at an increased risk when there is extreme cold. Children who need to walk to school or stand outside at a bus stop are at an increased risk of frostbite due to the potential of additional time outside in the cold. The elderly and those living in poverty may not have the resources to pay higher electrical bills in the severe winter months to keep their homes warm. If power is lost during the severe winter months, it can also cause dangerously cold temperatures inside and those with limited resources may find themselves with no place warm to go. Slippery roads and walkways also pose a threat to the safety of people, especially the elderly, who are more prone to falls. Individuals who live in rural or isolated areas are also at an increased risk for severe winter storms.

4.5.5 Severe winter Storms and Climate Change in Becker County:

Severe winter storms are a yearly occurrence in Becker County. The current climate change, which is occurring within the Midwest region, has the potential to increase the severe winter storm frequency within the Midwest, including Minnesota. Severe winter storms can have a large impact on public safety in Minnesota. This will continue, with a possible increase in snowstorm frequency and annual total snowfall. Severe winter weather is often a cause of power outages. Pressures on energy use, reduced reliability of services, potential outages and a potential rise in household costs for energy are major climate change risks to public health.

4.5.6 Relationship to other Hazards in Becker County:

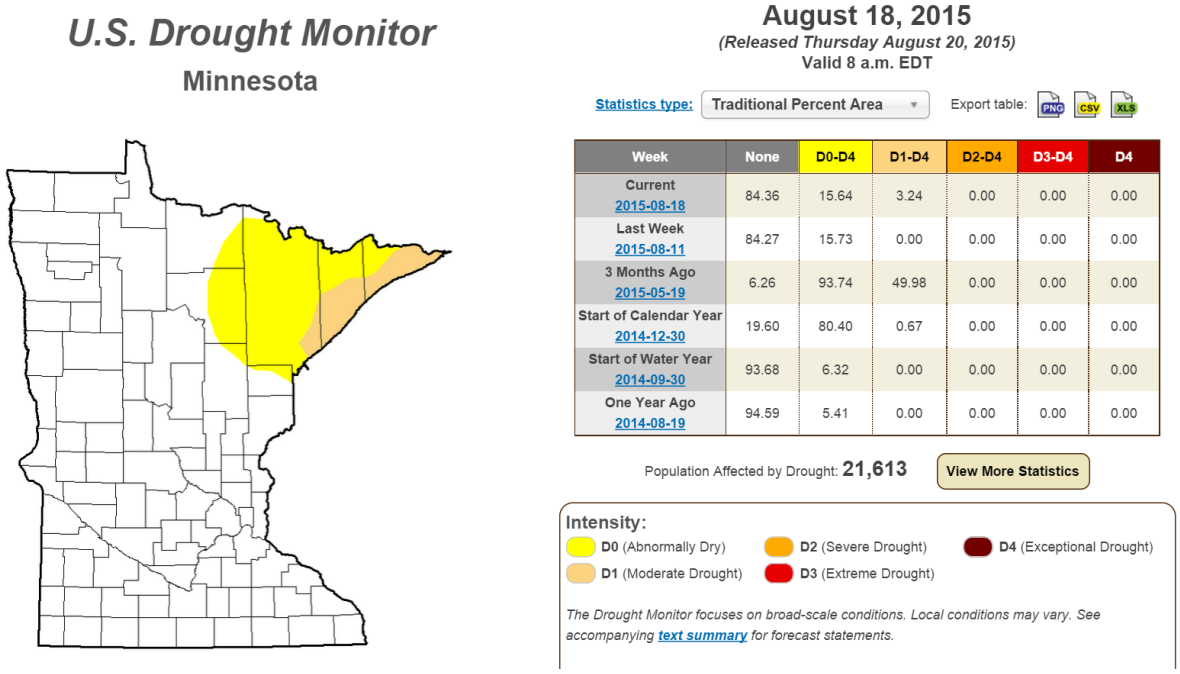
Severe winter storms have relationships to other hazards such as flooding and structural fires. Snowmelt from heavy snows can cause localized flooding which can cause dangerous conditions for residents and motorists. It can also destroy property and infrastructure such as roads. In addition, heavy winter snowstorms can cause power outages that may cause residents to use alternative heating methods, which can increase the risk of structural fires.

4.6 Drought

The drought was identified in the prior Hazard Mitigation Plan from May 2008 for Becker County and was identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Additionally, analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what drought is the history of it within Becker County and the potential it has to impact the County residents. A definition of drought from the Minnesota Department of Natural Resources (DNR) is provided prior to taking a closer look at the effect drought has on Becker County in order to provide the reader with knowledge of the hazard.

According to the Minnesota Department of Natural Resources (DNR), drought is defined as a period of abnormally dry and/or unusually hot weather sufficiently prolonged for the corresponding deficiency of water to cause a *serious hydrologic imbalance*. Drought affects the County in several ways: 1) when a serious hydrologic imbalance occurs, 2) soil moisture reserves, 3) groundwater supplies, 4) lake levels and 5) stream flows are reduced. Water-dependent industries including agriculture, public utilities, forestry, and tourism are often severely impacted. The figure below depicts the drought intensity for Minnesota as of August 18, 2015. The drought intensity status of Becker County at the time of this drought monitor was none.

Figure 18: U.S. Drought Monitor for Minnesota



4.6.1 Drought Risk for Becker County:

While the probability for drought is possible, its relative impact is low and thus, the overall risk for drought in Becker County is little to No risk. The risk for drought for each of the cities is based on the data provided by the National Oceanic Atmospheric Administration which was broken up by East and West Becker County. *Note: The cities in the County which are in West Becker County are Detroit Lakes, Frazee, Callaway, Audubon, Lake Park and Ogema. The city in East Becker County is Wolf Lake. In assessing drought for the 2015 update, data from 2009 to 2014 was used to determine the risk for Becker County. While the relative risk for a drought is low, drought is still a concern in Becker County because of the impact a period of drought may have on agriculture, forestry and tourism in the County. Agriculture is an important industry in

the County and, as noted in the community profile section of this plan, 60.9 percent of the County land use is agricultural, so a drought could have a significant impact on a large industry in Becker County. The table provided below provides the name of each of the cities in the County, the probability that drought will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 65: Drought Hazard Risk Assessment

Drought			
City	Probability	Impact	Risk
Audubon	Possible	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Possible	Low	Little to No
Frazee	Possible	Low	Little to No
Lake Park	Possible	Low	Little to No
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Possible	Low	Little to No
Total	Possible	Low	Little to No

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents little change from the previous plan. The last plan update was done in May 2008 and indicated that drought had the potential to have a limited substantial impact on Becker County and no significant threat is posed. This meant that the hazard was found to occur once in 10 years could have limited substantial impact on a large area of Becker County.

4.6.2 Drought History in Becker County:

The most recent drought events in Becker County were reported in April 2015. The entire county had drought conditions on April 28, 2015, which were reported by the National Climatic Data Center as having occurred in East and West Becker County.

Drought history in Becker County National Climatic Data Center records shows droughts in Becker County in the years of 2006, 2007 and 2015. In 2006 and 2007, the droughts in Becker County spanned over several months from mid-July to December in 2006 and from January to April in 2007. A comprehensive list of the last 50 years of data can be found in Appendix B.

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 included problems with drought mitigation in Becker County. The plan stated that droughts affect Becker County in various ways. Mitigation needs to be done now because droughts can influence agriculture, shallow bodies of water and wells, fire risk, hunting, fishing and tourism. Burlington Township documented an increased loss of road materials such as gravel during drought years and/or dry conditions. In addition, Spruce Grove and Riceville Townships have been affected by drought conditions. Pine Point Township was losing trees and gravel off

roads due to drought conditions. Additional problems related to drought conditions were that golf courses often have to cease operations during extremely dry periods, causing individual economic distress and farmers can have irrigation problems during a drought. As such, this iteration of the mitigation plan includes the continuance of projects and processes aimed at managing the impacts of drought.

Declared Disasters
Of the Aforementioned droughts, the only drought in the last 50 years in Becker County which has been declared a disaster by FEMA was in June 1976. This was an emergency declaration, which is more limited in scope and without the long-term federal recovery programs of a Major Disaster Declaration. This drought incident began in June 1976 and the disaster close out was in 1979. Public assistance and hazard mitigation programs were declared for this incident.

Table 66: Emergency Declared Disasters Drought

Individuals and Households Program Declared	Individual Assistant Program Declared	Public Assistance Program Declared	Hazard Mitigation Program Declared	Declaration Date	Incident Type	Incident Begin Date	Incident End Date	Disaster Close Out Date	Declared Location
No	No	Yes	Yes	6/17/1976	Drought	6/17/1976	6/17/1976	3/14/1979	Becker County, MN

4.6.3 Mitigation Actions in the Past Five Years in Becker County:
Mitigation actions for drought from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for drought was to educate residents about fire prevention and protect people from drought-related damage by enforcing burning bans, identify sources of water when shortages occur and work to protect ranching and agriculture. These efforts are contoured in this iteration of the mitigation plan.

4.6.4 Vulnerability in Becker County:
Drought presents vulnerabilities to the residents in Becker County. Individuals whose livelihoods rely on water, such as farmers who need water to produce crops, can be heavily impacted by drought. As stated in the Community Profile Section of this plan, 60.9 percent of the land in Becker County is used for agricultural purposes. Financial-related stress due to drought conditions can lead to mental health illness including depression and suicide thoughts. Drought can also have a significant impact on the economy due to the destruction of major crops. The drying effect of drought on vegetation also increases the risk of wildfire and the vulnerability of structures located in wildland interface areas.

Additionally, Becker County is a lake community which generates tourism during the summer months because of water-related recreation. A drought in the county would have a negative impact on the number of visitors and individuals partaking in water-related recreation activities in the county. This could cause a decrease in revenue for the county has a whole.

Those living in poverty in Becker County, 12.1 percent of the population, are also at an increased risk due to drought conditions. Individuals living in poverty may not be able to afford increasing prices during drought conditions, making it possible for individuals to suffer health problems because of the lack of healthy food. Children and the elderly, who make up 47 percent of the population within Becker County, are also at increased risks of illness related to drought conditions. The Centers for Disease Control and Prevention indicated acute respiratory and gastrointestinal illnesses can be more easily spread during

drought conditions. E.coli and Salmonella are bacteria that can more readily contaminate food during drought conditions.

4.6.5 Drought and Climate Change:

The 2014 Minnesota All Hazard Mitigation Plan states that Minnesota's climate is changing in ways that will affect the environment, economy, and everyday life. Climate change is occurring and has the potential to affect the frequency of drought in Becker County. According to the 2014 National Climate Assessment from the U.S. Global Change Research Program, for the Midwest region, temperatures above 95°F are expected to increase in frequency by mid-century. Higher temperatures are associated with negative human health impacts and suppressed agricultural yields. In addition, the 2014 National Climate Assessment indicated the frequency of days with very heavy precipitation (the wettest 2% of days) is also projected to increase, raising the risk of floods and nutrient pollution. Direct effects of climate change will include increased heat stress, flooding, drought, and late spring freezes.

The 2014 National Climate Assessment indicated that in the next few decades, longer growing seasons and rising carbon dioxide levels will increase yields of some crops, though those benefits may be offset by extreme weather events. It was determined through this assessment that in the long term, the combined stresses associated with climate change are expected to decrease agricultural productivity. The 2014 National Climate Assessment indicated that while there was no apparent change in drought duration in the Midwest region as a whole over the past century, the average number of days without precipitation is projected to increase in the future. This could lead to agricultural drought and suppressed crop yields and a reduction in water could adversely impact recreational activities associated with tourism. Agriculture and Tourism are important to the economic vitality of Becker County,

4.6.6 Relationship to other Hazards in Becker County:

There are three hazards which are related to drought. The first is wildfires because drought conditions can significantly increase the risks of wildfire. Wildfires can ignite very easily under very dry conditions and can spread quickly. Lightning strikes can be a cause for the start of a wildfire, especially under such dry conditions. Under drought conditions, not enough precipitation falls to relieve the land from drought and wildfires can readily escalate and get out of hand. Burn bans may be put into effect in an effort to stop the wildfires from developing and easily spreading. The second hazard associated with droughts is subsidence because periods of drought can cause shrinkage of soils, which can impact subsidence.

The third hazard associated with droughts is extreme heat because extreme heat and drought conditions often coexist with each other. The presence of one may cause the other to appear, the main difference is that drought conditions can last for months. There are several health related dangers associated with extreme heat. There are also increased loads placed on electrical grids to run air conditioning units, which can cause loss of power to residents in the county. Loss of power can lead to extended periods of time that more vulnerable individuals, such as those living in poverty, the elderly and children, may spend in extreme heat. In addition, extreme heat means more electrical demands on air conditioning units for residents. This can increase electrical bills, which can impact those who are living in poverty.

4.7 Infectious Disease

Infectious Disease was identified in the prior Hazard Mitigation Plan from May 2008 for Becker County and was identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Additionally, analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what infectious disease is the history of it within Becker County and the potential it has to impact the County residents. A definition of infectious disease is provided prior to taking a closer look at the effect infectious disease has on Becker County in order to provide the reader with knowledge of the hazard.

Infectious diseases are disorders caused by organisms, such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They are normally harmless or even helpful, but under certain conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person. Some are transmitted by bites from insects or animals, and others are acquired by ingesting contaminated food or water or being exposed to organisms in the environment.

Signs and symptoms vary depending on the organism causing the infection but often include fever and fatigue. Mild complaints may respond to rest and home remedies while some life-threatening infections may require hospitalization. Many infectious diseases, such as measles and chickenpox, can be prevented by vaccines. Frequent and thorough hand-washing also helps protect you from infectious diseases.
The following hazard analysis includes relevant national, state, and county level (if available) disease outbreak information. It is important to note that Minnesota is divided into eight regions that house local public health agencies in Minnesota.

4.7.1 Definitions of Infectious Diseases included in the table below:

West Nile virus (WNV) is most commonly transmitted to humans by mosquitoes. You can reduce your risk of being infected with WNV by using insect repellent and wearing protective clothing to prevent mosquito bites. There are no medications to treat or vaccines to prevent WNV infection. Fortunately, most people infected with WNV will have no symptoms. About 1 in 5 people who are infected will develop a fever with other symptoms. Less than 1% of infected people develop a serious, sometimes fatal, neurologic illness.

Giardiasis is a diarrheal disease caused by the microscopic parasite *Giardia*. A parasite is an organism that feeds off of another to survive. Once a person or animal (for example, cats, dogs, cattle, deer, and beavers) has been infected with *Giardia*, the parasite lives in the intestines and is passed in feces (poop). Once outside the body, *Giardia* can sometimes survive for weeks or months. *Giardia* can be found in every region of the U.S. and around the world.

HIV is a virus spread through body fluids that affect specific cells of the immune system, called CD4 cells, or T-cells. Over time, HIV can destroy so many of these cells that the body can't fight off infections and disease. When this happens, HIV infection leads to AIDS.

Lyme disease is caused by the bacterium *Borrelia burgdorferi* and is transmitted to humans through the bite of infected black-legged ticks. The black-legged ticks are mostly found in the forested areas of north and east central Minnesota. The black-legged tick may also be found in forested areas outside of Central Minnesota. The tick while camping or hiking typically bites those infected with Lyme disease. Typical symptoms include fever, headache, fatigue, and a

characteristic skin rash called erythema migrans. If left untreated, the infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful if used correctly and performed with validated methods. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, applying pesticides, and reducing tick habitat. The ticks that transmit Lyme disease can occasionally transmit other tickborne diseases as well.

Anaplasmosis is a vector-borne bacterial disease caused by a bite from a black-legged tick. For Anaplasmosis bacteria to transfer to humans, the tick must be attached for 12 to 24 hours. As with Lyme disease, the black-legged tick is found in forested areas in north central and east central Minnesota. Symptoms of Anaplasmosis include fever (over 102° F), severe headache, muscle aches and chills with shaking. Other symptoms may include nausea, vomiting, abdominal pain, diarrhea and change in mental status. Tetracycline antibiotics are typically prescribed for the infection.

Pertussis, also known as whooping cough, is a highly contagious respiratory disease. It is caused by the bacterium *Bordetella pertussis*. Pertussis is known for uncontrollable, violent coughing which often makes it hard to breathe. After fits of many coughs, someone with pertussis often needs to take deep breaths which result in a "whooping" sound. Pertussis most commonly affects infants and young children and can be fatal, especially in babies less than 1 year of age. The best way to protect against pertussis is immunization.

Salmonellosis is an infection with bacteria called *Salmonella*. Most persons infected with *Salmonella* develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. The illness usually lasts 4 to 7 days, and most persons recover without treatment. However, in some persons, the diarrhea may be so severe that the patient needs to be hospitalized. In these patients, the *Salmonella* infection may spread from the intestines to the bloodstream, and then to other body sites and can cause death unless the person is treated promptly with antibiotics. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness.

Chlamydia is a common STD that can infect both men and women. It can cause serious, permanent damage to a woman's reproductive system, making it difficult or impossible for her to get pregnant later on. Chlamydia can also cause a potentially fatal ectopic pregnancy (a pregnancy that occurs outside the womb).

4.7.2 Infectious Disease Risk in Becker County:

While the probability of infectious diseases is highly likely in Becker County, its relative impact is low and thus, the overall risk for infectious diseases in Becker County is Little to No. The risk for infectious diseases for each of the cities is the same because data was not available by individual city. In assessing infectious diseases for the 2015 update, data from 2013 for the Northwestern Region was used to determine this risk. The Northwestern Region used occurrences from the following counties: Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Marshall, Pennington, Roseau, and Red Lake. As such, the reader must take into account that risk is determined on a regional level versus County our city level. The table provided below provides the name of each of the cities in the County, the probability that infectious disease will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 67: Infectious Disease Risk by City in Becker County

Infectious Disease			
City	Probability	Impact	Risk
Audubon	Highly Likely	Low	Little to No
Callaway	Highly Likely	Low	Little to No
Detroit Lakes	Highly Likely	Low	Little to No
Frazee	Highly Likely	Low	Little to No
Lake Park	Highly Likely	Low	Little to No
Ogema	Highly Likely	Low	Little to No
Wolf Lake	Highly Likely	Low	Little to No
Becker County	Highly Likely	Low	Little to No
Total	Highly Likely	Low	Little to No

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents a significant change from the previous plan. This update indicated the overall risk for Becker County is Little to No. Whereas the last Plan update was done in May 2008 indicated that infectious disease had the potential to have a substantial major impact on Becker County and no significant threat was posed.

4.7.3 Infectious Disease History in Becker County:

The following data represents communicable diseases that have been reported in the August 19, 2014, Report of The Health of Becker, Clay, Wilkin and Otter Tail Counties. The infectious disease occurrences that are the highest in Becker County are Chlamydia and Lyme Disease.

Table 68: Communicable Disease and Number of Occurrences

Communicable Disease	Number of Occurrences
Anaplasmosis	17
West Nile	0
Giardiasis	2.2 (average for, 2005-2010)
HIV and AIDS	13
Lyme disease	19
Pertussis	2011 percentage 0.01%
Salmonellosis	1 (2010)
Chlamydia Trachomatis (STD)	42
Viral Hepatitis, Type A	0

Source: University of Minnesota Morris Report of the Health of Becker, Clay, Wilkin and Otter Tail Counties from August 19, 2014.

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 included current problems related to infectious disease in Becker County. It was stated that the heavy turkey population in Becker County could be at risk if the avian bird flu virus was found. Additionally, deceased animal contamination was listed

as a problem. Dead animals are a concern for infectious diseases. Many diseases including the avian flu, Anthrax or West Nile could be passed on through the bodies of deceased wild and domesticated animals. An increase in certain infectious diseases could be seen if bodies are not either picked up or buried according to the regulations (so many feet above the water table).

Poultry Farms
Poultry farms are a major economic activity in Becker County. According to the Center For Infectious Disease Research and Policy, there have been recent outbreaks of a highly pathogenic avian influenza H5N2 virus. With Minnesota being the nation's top turkey-producing state, the outbreak is a big worry for turkey farmers. Avian flu outbreaks usually cause international trading partners to ban imports from affected regions. Minnesota produces about 46 million turkeys a year, and about 8% of them were exported in 2013, according to the AP story.

4.7.4 Presidential Declared Disasters for Infectious Disease in Becker County:
No presidential declared disasters for infectious disease in the past 5 years.

4.7.5 Mitigation Actions in the Past Five Years in Becker County:
Mitigation actions for infectious disease from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for infectious disease was to continue surveillance and attentiveness to keep problems from occurring and to plan for a local, regional or widespread pandemic flu. While surveillance efforts will continue new to this plan is the inclusion of infectious disease with regard to agriculture and ranching

4.7.6 Vulnerability in Becker County:
In Becker County, there are certain populations of people who are more susceptible to infectious disease. The elderly and children are at an increased risk of becoming infected with airborne diseases because of weakened immune systems and spending more time in crowded settings, which more easily spread airborne diseases such as schools and nursing homes. The elderly population, as stated in the Community Profile Section of this plan, makes up 15 percent of the population in Becker County. The elderly population is also expected to continue to increase. The population of children in Becker County, which as stated in the Community Profile Section of this plan, makes up 32 percent of the population, is also at an increased risk. There is also increased the risk of tick and mosquito-transmitted diseases, such as Lyme Disease, Anaplasmosis, and West Nile Virus because of possible exposure in forested areas of the county. Individuals who spend time outside or in these forested areas are at an increased risk.

4.7.7 Infectious Disease and Climate Change:
According to the World Health Organization, changes in infectious disease transmission patterns are a likely major consequence of climate change. There are three categories of research into the linkages between climatic conditions and infectious disease transmission. The first examines evidence from the recent past of associations between climate, variability, and infectious disease occurrence. The second looks at early indicators of already-emerging infectious disease impacts of long-term climate change. The third uses the above evidence to create predictive models to estimate the future burden of the infectious disease under projected climate change scenarios.

Types of diseases which are impacted by climate change are vector-borne and water-borne diseases. Important determinants of vector-borne disease transmission include vector survival and reproduction, the vector's biting rate, and the pathogen's incubation rate within the vector organism. Vectors, pathogens and

hosts each survives and reproduce within a range of optimal climatic conditions: temperature and precipitation are the most important, while sea level elevation, the wind, and daylight duration are also important. Human exposure to waterborne infections occurs by contact with contaminated drinking water, recreational water, or food. Exposure to waterborne infections may also result from human actions, such as improper disposal of sewage wastes, or be due to weather events. Rainfall can influence the transport and dissemination of infectious agents while temperature affects their growth and survival.

Source: World Health Organization

4.7.8 Relationship to other Hazards in Becker County:

Flood and drought conditions are associated with infectious disease because food and waterborne disease outbreaks can be sparked by flood and drought conditions. Food and water can become contaminated during flood and drought conditions, which can negatively impact the public's health. Norovirus, Salmonella, and E. coli are also associated with waterborne illness outbreaks, which are usually caused by drinking water contaminated by animal or human waste. Additionally, standing water from lakes and/or flooding can cause the mosquito population to increase, making West Nile Virus more likely.

4.8 Invasive Species

Invasive Species was a new hazard identified to be included in the Becker County Hazard Mitigation Plan update for Becker County. The prior Plan from May 2008 for Becker County did not include invasive species. A definition is provided in order to orient the reader with a background of what invasive species are, what history they have in Becker County and the potentially invasive species have on the residents of Becker County.

Invasive species are non-native organisms that pose a threat to an ecosystem, to the environment, to the economy, or to human health. They may be animals, plants, or microorganisms that usurp the habitats of native life forms, causing them to decline in population or to disappear from their natural environment. These organisms are introduced either accidentally or intentionally by human beings or their activities. Not all introduced species are invasive; however, an organism that is beneficial in one place may become a nuisance in another. Species described as "introduced" are not considered a threat to their new environment, whereas invasive species are regarded as pests.

4.8.1 Invasive Species Program:

To address the problems caused by invasive species, the 1991 Minnesota Legislature directed the Minnesota Department of Natural Resources (DNR) to establish the Invasive Species Program. The program is designed to implement actions to prevent the spread of invasive species and manage invasive aquatic plants and wild animals (Minnesota Statutes 84D). Most of the invasive species prevention and management activities are conducted or directed by staff from DNR's Division of Ecological and Water Resources – Invasive Species Program. In addition, the program hires approximately 150 seasonal staff during the summer to inspect boats at public water accesses and help implement management activities. In total, the equivalent of more than 25 full-time positions is focused on invasive species work. The DNR's Invasive Species Program addresses many species that are present in Minnesota, such as Eurasian watermilfoil, purple loosestrife, zebra mussels, and spiny water fleas. The program also attempts to prevent the introduction of invasive species that have the potential to move into Minnesota, for example, hydrilla and water chestnut. To do so, the program identifies potentially invasive species in other areas of North America and the world, predicts pathways of spread, and develops and implements solutions that reduce the potential for introduction and spread. Prevention activities are often undertaken in collaboration with other states, agencies, and partners with similar concerns. Prevention efforts today not only reduce the spread of invasive species but also buy the critical time needed for research and management that may provide long-term control solutions.

4.8.2 Factors that Make a Species Invasive:

In most cases, invasive species are very competitive, highly adaptive, and extremely successful at reproducing. Factors relating to the new environment, however, are also important. For example, an organism may have been held in check in its place of origin by predators; if its new environment lacks predators, there may be nothing to stop it spreading uncontrollably. A predatory animal in its natural environment may be part of a stable ecosystem as prey animals have adapted to deal with it. In a new environment, where potential prey lacks these adaptations, it may threaten other species with extinction.

4.8.3 Invasive Species Risk for Becker County:

The overall probability for invasive species within Becker County is Likely, its relative impact is Low and thus, the overall risk for invasive species within Becker County is Little to None. The risk for invasive species in Becker County is based upon the specific data collected and outlined in the history section of

this hazard profile. In assessing invasive species for the 2015 update, data from 2009-2014 was used to determine the risk for Kittson County, including each of the cities and the county as a whole. The table provided below provides the name of each of the cities in the County, the probability that invasive species will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 69: Invasive Species Risk by City in Becker County

Invasive Species			
City	Probability	Impact	Risk
Audubon	Likely	Low	Little to No
Callaway	Likely	Low	Little to No
Detroit Lakes	Likely	Low	Little to No
Frazee	Likely	Low	Little to No
Lake Park	Likely	Low	Little to No
Ogema	Likely	Low	Little to No
Wolf Lake	Likely	Low	Little to No
Becker County	Likely	Low	Little to No
Total	Likely	Low	Little to No

4.8.4 Invasive Species History in Becker County:

According to the Department of Natural Resources Minnesota's natural resources are threatened by a number of invasive species such as zebra mussels, Eurasian watermilfoil, common buckthorn, and emerald ash borer. Invasive species in Minnesota occur on land or in the water. The MN DNR works to help prevent the spread and promote the management of invasive species. Zebra mussels have been confirmed in Lake Eunice in Becker County in northwestern Minnesota, according to the Minnesota Department of Natural Resources. State and local officials are also working to slow the spread of zebra mussels in Becker County after discovering a colony in Lake Melissa, near Detroit Lakes. Big Cormorant Lake, the second biggest lake in Becker County, also could have Zebra Mussels.

In 2007, the Minnesota DNR conducted a survey of Detroit Lake to assess the extent of invasive plant spread throughout the lake. The DNR was interested in monitoring flowering rush in Detroit Lake because, at the time, only 14 water bodies in the state were recognized as containing flowering rush (MNDNR Ecological Resources 2006). DNR Ecological Resources invasive species field staff conducted a point-intercept vegetation survey of Detroit Lake in late July 2007. Submerged aquatic plants were found in 97 % of the sites surveyed from the shore to a depth of 20 feet. A total of 25 native aquatic plant species were recorded. Common native aquatic species included greater bladderwort (Utricularia vulgaris), muskgrass (Chara spp.), northern water milfoil (Myriophyllum sibiricum), and sago pondweed (Stuckenia pectinata).

According to the Department of Natural Resources Designation of Infested Waters published on July 29, 2015, Becker County, Minnesota has 25 listed infested water bodies, which are infested with zebra mussels, faucet snail, and flowering rush. Terrestrial Invasive species include animals, plants, and pathogens.

Table 70: Department of Natural Resources - List of Infested Waters - July 29, 2015

Water body	County	Species	DOW Number
Big Cormorant	Becker	Zebra mussel	03-0576
Buck	Becker	Flowering rush	03-0473
Buck	Becker	Zebra mussel	03-0473
Bucks Mill Pond	Becker	Zebra mussel	03-1249
Curfman (Deadshot Bay)	Becker	Flowering rush	03-0363
Detroit	Becker	Flowering rush	03-0381
Eunice	Becker	Zebra mussel	03-0503
Melissa	Becker	Flowering rush	03-0475
Melissa	Becker	Zebra mussel	03-0475
Mill	Becker	Flowering rush	03-0377
Mill Pond	Becker	Zebra mussel	03-0377
Muskrat	Becker	Flowering rush	03-0036
Pelican River from Detroit to Muskrat	Becker	Flowering rush	
Pickerel	Becker	Flowering rush	03-0287
Pickerel	Becker	Zebra mussel	03-0287
Sallie	Becker	Flowering rush	03-0359
Unnamed pond located in S14 and S15, T142, R39W	Becker	Faucet snail	03-0230
Unnamed pond located in S15 T142N, R39W	Becker	Faucet snail	03-0231
Unnamed pond located in SE ¼ of SW ¼ of S14, T142, R39W	Becker	Faucet snail	None
Unnamed pond located in SW ¼ of SE ¼ of S15, T142, R39W	Becker	Faucet snail	None
Unnamed pond located in the NE ¼ of NW ¼ of S22, T142N, R39W	Becker	Faucet snail	None
Unnamed pond located in the NE ¼ of SE ¼ of S15, T142N, R39W	Becker	Faucet snail	None
Unnamed pond located in the NW 1/4 of NE ¼ of S22, T142N, R39W	Becker	Faucet snail	None
Unnamed pond located in the SE ¼ of the SW ¼ of S15, T142N, R39W	Becker	Faucet snail	None
Unnamed pond located in the SW ¼ of SW ¼ of S14, T142N, R39W	Becker	Faucet snail	None

Source: Minnesota Department of Natural Resources

4.8.5 Presidential Declared Disasters for Invasive Species:

There have not been any presidential declared disasters for invasive species for Becker County.

4.8.6 Mitigation Actions in the Past Five Years in Becker County:

No mitigation actions for invasive species were listed in Becker County's May 2008 All Hazard Mitigation Plan, although the Minnesota Department of Natural Resources has efforts in place to prevent and control invasive species. Efforts to prevent invasive species from becoming established in new areas focus on tighter import controls, checks on imported goods, and, where practical, subjecting goods and materials to treatment with insecticides or sterilization procedures. Control of species that have already become established can be difficult. The methods used can include pesticides for plants and insects, physical removal of large plants, culling of animal pests, and the introduction of natural predators for plants and small animals. Note: issues of invasive species is new focus regarding mitigation planning.

Aquatic Invasive Species Handbook

Becker County also has created an Aquatic Invasive Species Handbook for Visitors and Residents to educate them and provide information about aquatic invasive species in the County. Information in this handbook is included on the following species: Zebra and Quagga Mussels, Bighead and Silver Carp, Faucet Snail, Spiny Water Flea, Curly-Leaf Pondweed, Flowering Rush, Eurasian Watermilfoil, and Hydrilla.

Grant for Cooperative Weed Management Program (CWMP)

The Becker Soil and Water Conservation District serving as the Agricultural Inspector for Becker County has been awarded a two-year grant from the National Fish and Wildlife Foundation to establish a Becker County Cooperative Weed Management Program (CWMP) to combat invasive weed species in the county. The grant referred to as a "Pulling Together Initiative Grant" is a cooperative effort to seek control of small emerging priority weed infestations located throughout the county and implement controls before the infestation worsens. The grant will focus on providing public education, identification, prevention, infestation locations and reporting these threats. This grant will allow for the development of a cooperative partnership by targeting resources to achieve invasive species management and target treatments using a variety of Integrated Pest Management techniques.

Five Invasive Plants that the grant will attempt to control by working with various agencies and landowners are the following (click on the plant name for detailed information):

1. Crown Vetch, Axseed: Coronilla varia
2. Leafy Spurge: Euphorbia esula
3. Spotted Knapweed: Centaurea maculosa
4. Tansy: Tanacetum vulgare
5. Wild Parsnip: Pastinaca sativa

This grant will allow for the development of a cooperative partnership by targeting resources to achieve invasive species management and target treatments using a variety of integrated pest management techniques. Also, cost-share assistance may be available to landowners who have an identified invasive weed problem.

Aquatic Invasive Species Laws

Laws regarding Aquatic Invasive Species are in place to prevent the spread of aquatic invasive species. The laws are as follows:

21 days - When moving equipment from a lake or river, all visible zebra mussels, facet snails and aquatic plants must be removed whether dead or alive. Equipment must be dry for at least 21 days and AIS free before placing in another waterbody.

Pull the Plug - All water draining devices must be removed or set to "open" when on public roads - including live wells.

Bait Disposal - Dispose of all unwanted bait in the trash, dumping unused bait on land or in the water is not legal.

Cooperative Approach to Addressing AIS

The Minnesota Board of Water and Soil Resources are also taking a cooperative approach to addressing invasive species. According to a publication in 2011 from the University of Minnesota Shoreland Education Team, a new method of dealing with invasive species has been gaining momentum within Minnesota. Partnerships called “Cooperative Weed Management Areas” (CWMAs) are being formed to systematically identify problems associated with invasive species and to solve them by combining resources and working cooperatively. These partnerships often include nonprofits, state and local government agencies, tribes, businesses, and private landowners. Additionally, Minnesota has designated Aquatic Management Areas or AMAs. Since their establishment by the Legislature in 1992 as part of the Outdoor Recreation System, AMAs have rapidly become one of the most successful state programs providing public access to our state’s lakes, rivers, streams, and wetlands while simultaneously providing protection for aquatic and shoreland habitats. Like wildlife management areas, parks, and forests, AMAs can be state-owned; or, in the case of cold-water trout streams, they are often linear conservation easements along a privately owned stream corridor, purchased mainly to provide access to anglers as well as limit land uses that would likely degrade the resource. Responsibility for managing and maintaining AMAs falls mainly to the DNR Section of Fisheries. In 2008, the Minnesota DNR convened a working group of citizens to develop a 25- year acquisition plan for Minnesota’s Aquatic Management Areas.

Decontamination Units

According to a news release on February 9, 2015, The Becker County Board approved the purchase of two contamination units, up to $19,000 each and taxes and fees that apply. The units are listed at $18,200 each and there are extras that can be purchased. The funding for the two units will come from the state AIS grant the county received last year. According to the news publication, the county already has one unit and two more units will provide “better coverage for the county.” The commissioners discussed that one unit will likely be kept by Lake Melissa since it is already contaminated with zebra mussels and one should be in the Cormorant Lakes area because of the high volume of boaters in that area. A third one would be good for the most eastern portion of the county like Osage and Cotton Lake.

AIS Position Creation

According to a news release on February 9, 2015, Becker County is hiring someone to work at least part time in Aquatic Invasive Species (AIS). The full-time position will help out in another department as well. It was suggested that the county partner with the Becker Soil and Water Conservation District and the

Pelican River Watershed District to best utilize the new hire and the AIS resources. While nothing is concrete yet, the county has begun the advertising process, looking for the perfect candidate. The proposal is that the county would hire the individual and contribute $25,000 from the general reserves to help fund the position. The county will also take care of hiring the inspectors. The BSWCD would supervise the coordinator, and the person would be housed in the PRWD office, getting the expertise administrator Tera Guetter has to offer. It was indicated that when the coordinator isn't busy with AIS, the other portion of the job would be working with Soil and Water. While other counties may have AIS under the Soil and Water department, those other counties are running an average of three programs where Becker County is running an average of 20 programs.

4.8.7 Vulnerability in Becker County:

A vulnerability with invasive species is how new invasive species are introduced to an area. Organisms can spread outside their native habitats through international trade and travel. Insects, fungi, and microorganisms can arrive on imported fruit and vegetables, on garden and houseplants, and in soil carried with these items. In some cases, imported garden plants themselves have become invasive. People can unwittingly carry microorganisms and even plant seeds from one country to another. Ships can carry a whole host of potentially harmful life forms, from marine organisms clinging to the sides or in ballast water to small mammals, such as rats and mice, inside the ship itself.

Many invasive species have been introduced deliberately. Animals kept as pets can if allowed to breed in the wild outside their original environment, become a major threat to an ecosystem. Animals and plants have sometimes been brought to new environments for agricultural or other commercial purposes, only to become a major pest. Some organisms have been imported in an attempt to control other invasive species. Additionally, boating and other water-related recreational activities, which are common in Becker County, can spread invasive species. There are laws developed and enforced by the Minnesota Department of Natural Resources in order to prevent the spread of invasive species.

4.8.8 Invasive Species and Climate Change in Becker County:

According to the Minnesota All Hazard Mitigation Plan from 2014, climate change will exacerbate a range of risks to the Great Lakes region, including changes in the range and distribution of important commercial and recreational fish species, increased invasive species, declining beach health, and harmful blooms of algae. Declines in ice cover will continue to lengthen the commercial navigation season (but also lead to increased danger in ice-based recreation activities.)

4.8.9 Relationship to other Hazards in Becker County:

Applicability is unknown.

4.9 Subsidence

Subsidence was identified in the prior Hazard Mitigation Plan from May 2008 for Becker County and was identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Additionally, analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what subsidence is the history of it within Becker County and the potential it has to impact the County residents. A definition of subsidence from the 2014 Minnesota State Hazard Mitigation Plan is provided prior to taking a closer look at the effect subsidence has on Becker County in order to provide the reader with knowledge of the hazard.

According to the 2014 Minnesota State Hazard Mitigation Plan, there are three types of potential problems associated with the existence or formation of sinkholes: subsidence, flooding, and pollution. Subsidence commonly involves a gradual sinking, but it could also result in an instantaneous or catastrophic collapse. In Minnesota, subsidence can occur in areas of the state where limestone and dolostone are present, such as the Northwestern corner of the state.

The change in the local environment affecting the soil mass causing subsidence and sinkholes collapse is called a triggering mechanism. Water is the main factor affecting the local environment that causes subsidence. The main triggering mechanisms for subsidence are water level decline, changes in groundwater flow, increased loading, and deterioration (abandoned coal mines). Water level decline can happen naturally or be human induced. Factors in water decline are pumping water from wells, localized drainage from construction, dewatering, and drought. Changes in the groundwater flow include an increase in the velocity of groundwater movement, increase in the frequency of water table fluctuations, and increased or reduced recharge. Increased loading causes pressure in the soil leading to failure of underground cavities and spaces. Vibrations caused by an earthquake, vibrating machinery and blasting can cause structural collapse followed by surface settlement.

Sinkholes and subsidence are also common in those areas of the state underlain by old abandoned coal and iron mines. Pillows left for roof support in the mines generally deteriorate over time and eventually collapse, removing roof support. This is particularly a problem where mines underlie more recently developed residential areas and roads.

4.9.1 Subsidence Risk in Becker County:

The overall probability for subsidence within Becker County is unlikely, its relative impact is low, and thus the overall risk for subsidence within Becker County is Little to None. The risk for subsidence in Becker County is based upon the specific data collected and outlined in the history section of this hazard profile. In assessing subsidence for the 2015 update, data from 2009-2014 was used to determine the risk for Becker County, including each of the cities and the county as a whole. The table provided below provides the name of each of the cities in the County, the probability that subsidence will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 71: Subsidence Risk by City in Becker County

Subsidence			
City	Probability	Impact	Risk
Audubon	Unlikely	No Impact	Little to No
Callaway	Unlikely	No Impact	Little to No
Detroit Lakes	Unlikely	No Impact	Little to No
Frazee	Unlikely	No Impact	Little to No
Lake Park	Unlikely	No Impact	Little to No
Ogema	Unlikely	No Impact	Little to No
Wolf Lake	Unlikely	No Impact	Little to No
Becker County	Unlikely	No Impact	Little to No
Total	Unlikely	No Impact	Little to No

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents little change from the previous Plan. The 2015 update indicate Little to None risk for subsidence in Becker County. Similarly, the last Plan update done in May 2008 indicated that subsidence had the potential to have a limited impact on Becker County and no significant threat was posed. This meant that the hazard was found to have not occurred prior and could have limited impact on single sites in Becker County.

4.9.2 Subsidence History in Becker County:

According to the 2008 Becker County Hazard Mitigation Plan, there is no history of subsidence in the county. There have not been any reports of subsidence in the county since.

4.9.3 Presidential Declared Disasters for Subsidence:

There were no declared disasters related to subsidence in Becker County.

4.9.4 Mitigation Actions in the Past Five Years in Becker County:

Mitigation actions for subsidence from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for subsidence was to control structure placements by enforcing current building and shoreland ordinances and examining the need for changes to current ordinances for increased protection. As Becker county is located in the lakes region of MN, subsidence prevention is a consistent issues and remains a focus of this iteration of the mitigation plan.

4.9.5 Vulnerability in Becker County:

Houses or businesses located near a body of water or waterway and anything located on the top of a considerable slope are more vulnerable to the possibility of subsidence.

4.9.6 Subsidence and Climate Change in Becker County:

Changes in climate have the potential to impact subsidence in Becker County. Periods of excessive and prolonged rainfall can cause ground water levels to rise and swell prone soils, particularly cohesive soils

with a high clay content (and to a lesser extent silt), which are particularly susceptible to volumetric change. Conversely, excessive and prolonged dry periods cause shrinkage. In winter, the waterlogged ground can move further by frost heave.

4.9.7 Relationship to other Hazards in Becker County:

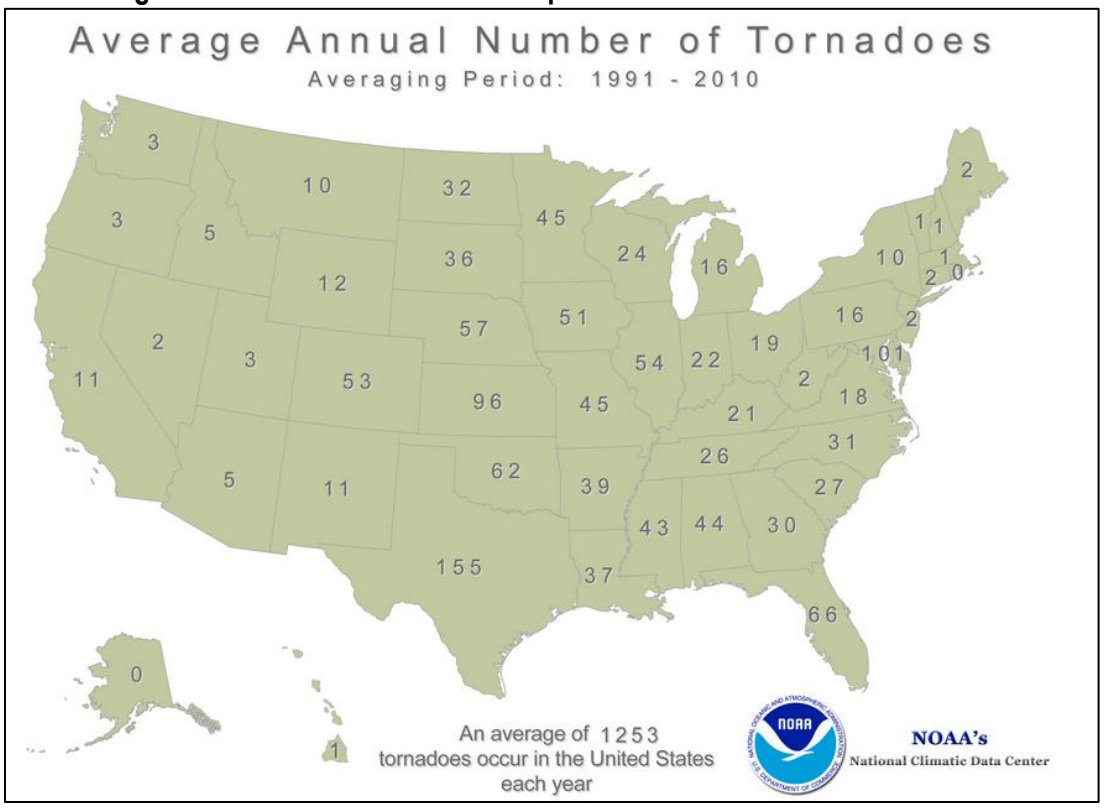
Subsidence can be related to other hazards such as severe summer storms, because they can cause excessive or prolonged periods of rain, which can cause the ground to become susceptible to volumetric change. Drought also has the potential to be related to subsidence because periods of drought can cause shrinkage of soils, which can impact subsidence. Additionally, flooding can cause excessive water on the ground which can cause volumetric changes.

4.10 Tornado

Tornado was identified in the prior Hazard Mitigation Plan from May 2008 for Becker County but was included as part of the Summer Weather hazard profile. For the 2015 update, the tornado was identified as a separate hazard to determine the impact potential it has in Becker County. Included in this hazard profile for a tornado are additional analyses to provide a more in-depth look at what a tornado is the history of tornadoes in Becker County and the potential they have to impact the county residents. A definition of tornadoes is provided prior to taking a closer look at the effect tornadoes have on Becker County in order to provide the reader with knowledge of the hazard.

Tornadoes can and do occur in all months of the year; however, the most tornadoes usually occur during severe thunderstorms in the warm months. Tornadoes are defined as violently rotating columns of air extending from thunderstorms to the ground, with wind speeds between 40-300 mph. They develop under three scenarios: (1) along a squall line; (2) in connection with thunderstorm squall lines during hot, humid weather; and (3) in the outer portion of a tropical cyclone. Funnel clouds are rotating columns of air not in contact with the ground; however, the column of air can reach the ground very quickly and become a tornado.

Figure 19: Average Annual Number of Tornadoes per State



4.10.1 Enhanced Fujita (EF) Scale:

On February 1, 2007, the National Weather Service adopted "Enhanced Fujita (EF) Scale". The EF Scale evaluates and categorizes tornado events by intensity. Both the original Fujita Scale and the EF Scale estimate the intensity of a tornado (3-second gust speed) based on the magnitude of damage.

The original scale had a lack of damage indicators and with the increasing standards for buildings; a rating of tornadoes was becoming inconsistent. The EF Scale evaluates tornado damage with a set of 28 indicators (see NOAA website). Each indicator is a structure with a typical damage description for each magnitude of a tornado. The Fujita Scale Table is both a breakdown of the Fujita Scale and a comparison to the Enhanced Fujita Scale.

Table 72: Fujita scale

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	**0**	**65-85**
1	73-112	79-117	1	86-109	**1**	**86-110**
2	113-157	118-161	2	110-137	**2**	**111-135**
3	158-206	162-209	3	138-167	**3**	**136-165**
4	207-260	210-261	4	168-199	**4**	**166-200**
5	261-318	262-317	5	200-234	**5**	**Over 200**

Tornadoes can be from twenty feet in width to larger than a mile on the ground and are transparent until the vortex fills with water vapor, dust, dirt, or debris. Uniquely dangerous are rain-wrapped tornadoes. If there is heavy rainfall near a tornado, a tornado can become masked or wrapped in the rainfall and become hidden. During a possible tornado event, the National Weather Service issues warning to the public to take shelter even if no tornado is visible because it may be rain-wrapped or not coming from a west, southwest direction unlike the majority of storms in the Midwest.

According to the National Oceanic Atmospheric Administration (NOAA), National Severe Storms Laboratory thunderstorms develop in warm, moist air in advance of eastward-moving cold fronts. These thunderstorms often produce large hail, strong winds, and tornadoes. Tornadoes in the winter and early spring are often associated with strong, frontal systems that form in the Central States and move east.

4.10.2 Tornado Risk in Becker County:

The overall probability that tornadoes will occur each year in Becker County is likely, its relative impact is moderate, and thus the overall risk for Becker County is low. The risk for tornadoes for each of the cities is different and was determined based upon the specific data collected and outlined in the history section of this hazard profile. In assessing tornado data for the 2015 update, data from 2009 to 2014 was used to determine the risk for each of the cities and the County as a whole. Most notable is the cities of Lake Park, Frazee, Ogema, Detroit Lakes and the unincorporated areas of Becker County, because these areas are at a Low risk of tornadoes each year and have an extensive history of tornadoes. The table provided below provides the name of each of the cities in the County, the probability that tornadoes will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 73: Tornado Risk by City in Becker County

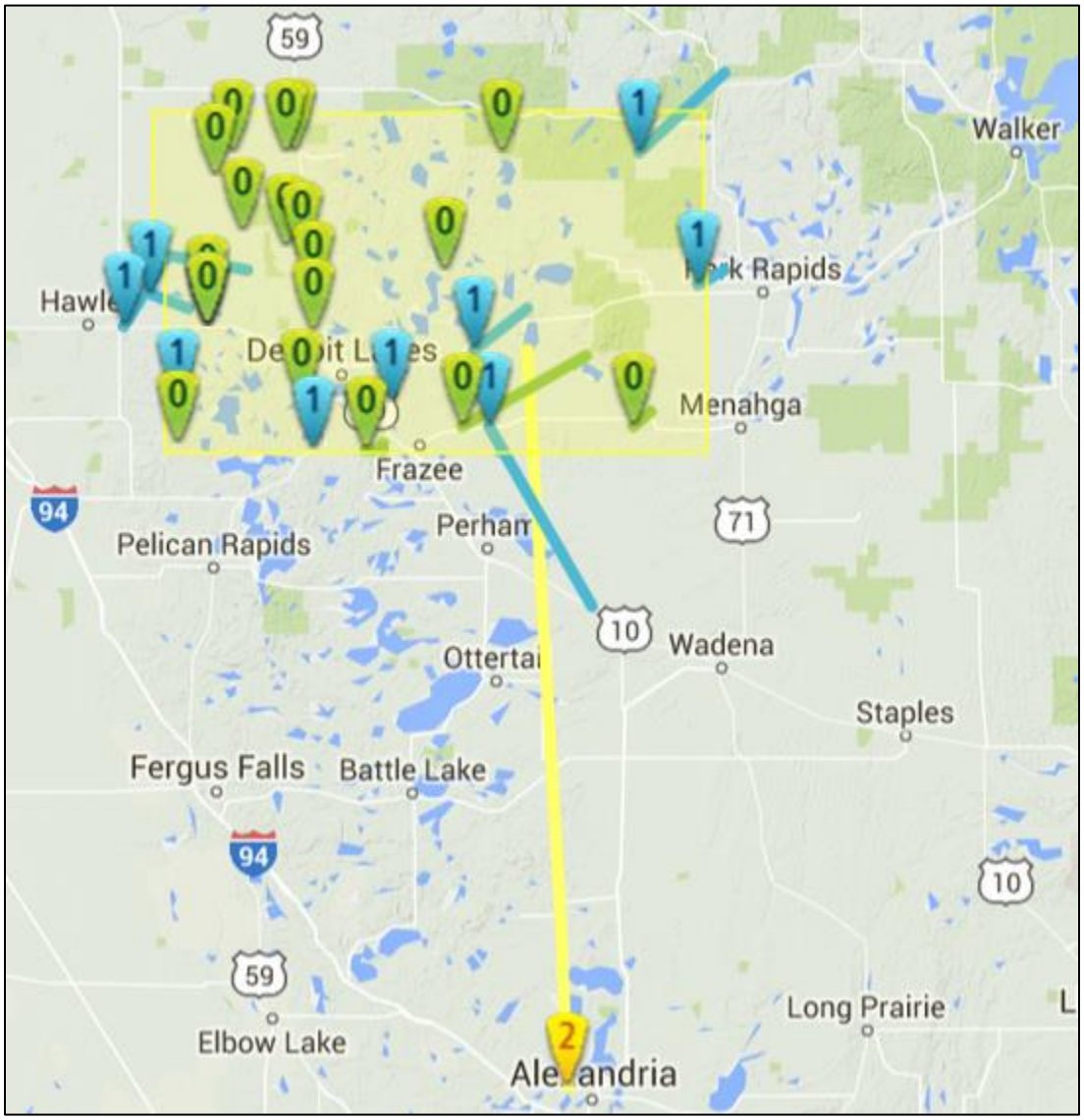
Tornado Storms			
City	Probability	Impact	Risk
Audubon	Unlikely	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Likely	Moderate	Low
Frazee	Likely	Moderate	Low
Lake Park	Likely	Moderate	Low
Ogema	Likely	Low	Low
Wolf Lake	Unlikely	Low	Little to No
Becker County	Likely	Moderate	Low
Total	Likely	Moderate	Low

4.10.3 Tornado History in Becker County:

Tornadoes in Minnesota peak in the months of June and July. The typical time of day for tornadoes in Minnesota ranges between 4:00 P.M. and 7:00 P.M. Most of these are minor tornadoes, with wind speeds under 125 miles per hour. A typical Minnesota tornado lasts approximately ten minutes, has a path length of five to six miles, is nearly as wide as a football field, and has a forward speed of about thirty-five miles an hour and affects less than 0.1% of the county warned. The history of tornado events in Becker County was provided by National Oceanic Atmospheric Administration (NOAA). From 2009 to 2014, there have been no recorded events of a tornado in Becker County. The most recent tornado occurred in the city of Frazee in July 2008. A comprehensive list of the last 50 years of data can be found in Appendix B.

The following image shows the tornado track for the tornadoes which, have occurred in the county from 1964 to 2014. There have been 30 tornadoes in Becker County during this time frame, with no fatalities and 4 injuries. The numbers on the map correspond to the Fujita Scale number for each tornado that is a scale from 0-5, with 0 being the least severe and 5 being the most severe.

Figure 20: Tornado Track for Becker County



Source: Tornado History Project for Becker County, MN

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 included current problems related to tornadoes in Becker County. The first problem was that some areas of Becker County were in need of a new siren or siren maintenance. The areas which did not have sirens were Audubon, Detroit Lakes, Lake Park, Callaway, Ogema, Wolf Lake and Osage. Additionally, tornado shelters were listed as a problem in Becker County. It was stated that tornado shelters are important to have at or near susceptible facilities such as trailer parks and campgrounds. Residents lacking a basement may also want to visit a shelter during inclement weather.

- The city of Audubon had locations for citizens to go but has no one designated to open up and watch the shelters.
- Detroit Lakes had no formal tornado shelter agreements but has locations that the public can go if a tornado would occur.

- Frazee had no set designation for a tornado shelter, but possible localities do exist.
- Two out of three trailer courts did not have an onsite shelter.
- Many visitors come to Becker County because of its lakes, cabins, and resorts. People not familiar with the county may need additional help in case of an emergency that needs sheltering.
- Every township in Becker County has a shelter that is listed in the Emergency Operations Plan. These designated buildings may not be for tornadoes, rather than snowstorms or holding people after a hazard occurs.

Disaster Declarations

Of the aforementioned severe summer storms, there has been five tornado or severe storm incidences, which have been declared a disaster by FEMA in the last 50 years in Becker County. These disasters were all major declared disasters, which is when the event is clearly more than state or local governments can handle alone. The beginning and ending date of the incident are included for these declared disasters, as well as information on the type of assistance program that was provided.

Table 73: Major Declared Disasters for Tornado (Disaster declared for Becker County)

IH Program Declared	IA Program Declared	PA Program Declared	HM Program Declared	Declaration Date	Disaster Type	Title	Incident Begin Date	Incident End Date	Disaster Close Out Date	Declared County/ Area
No	Yes	Yes	Yes	6/14/2002	DR	SEVERE STORMS, FLOODING, AND TORNADOES	6/9/2002	6/28/2002	4/25/2012	Becker (County)
No	Yes	Yes	Yes	5/16/2001	DR	SEVERE WINTER STORMS, FLOODING, AND TORNADOES	3/23/2001	7/3/2001	11/6/2013	Becker (County)
No	No	Yes	Yes	8/18/1995	DR	SEVERE THUNDERSTORMS, WINDS, FLOODING, TORNADOES, AND HEAT	7/9/1995	7/14/1995	9/18/2001	Becker (County)
No	Yes	Yes	Yes	6/11/1993	DR	SEVERE STORMS, TORNADOES & FLOODING	5/6/1993	8/25/1993	3/11/2009	Becker (County)
No	Yes	Yes	Yes	7/17/1975	DR	SEVERE STORMS, TORNADOES & FLOODING	7/17/1975	7/17/1975	11/6/1981	Becker (County)

4.10.4 Mitigation Actions in the Past Five Years in Becker County:

Mitigation actions for tornadoes from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for tornadoes was to improve shelter opportunities by providing unprotected residents a shelter and annual prepare chose shelter sites. With tornadoes remaining a constant risk, in this next cycle of the mitigation plan, the focus is to build actual shelters. Education, early warning and forecasting remain high priorities as well.

In addition, there have been a number of long-term hazard mitigation measures through the Hazard Mitigation Grant Program (HMGP) through FEMA. The purpose of this program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. HMGP is available when authorized under a presidential major

disaster declaration, in the areas of the State requested by the governor. The following chart shows the HMGP which has occurred in the last five years in Becker County along with the project title, amount, and other relevant data. There has been one project related to tornados.

Table 74: Mitigation Projects in Becker County for Tornadoes

Date	Incident Type	Disaster Title	Project Type	Project Title	Project Description	Project Counties	Status	Sub-grantee	Sub-grantee FIPS Code	Project Amount	Cost Share Percentage
07/02/2010	Tornado	SEVERE STORMS, TORNADOES, AND FLOODING	601.1: Generators	Perham 5% Initiative Generator Project	Install emergency backup generator in the City of Perham for the City Hall to ensure continuity of emergency services in time of severe weather and other disaster events.-JNELSO13-10/05/2011 20:29 GMT	BECKER; OTTER TAIL	Approved	Perham	50470	$33,174	75%

4.10.5 Vulnerability in Becker County:

The most active "tornado month" in Minnesota is June (33% of all occurrences), with July next (28% of all occurrences, and then May (17% of all occurrences). During these three months, over 75 percent of all tornadoes occur when many people may be enjoying outdoor recreational activities in Becker County. Tornadoes have never been reported in the Minnesota during December, January, and February.

Schools, hospitals, fire departments, police departments and other critical facilities are also at increased vulnerability because if they would become damaged during a tornado. The county would need to rely on other facilities within the county or surrounding counties depending upon the amount of damage. Trailer parks, mobile homes and other areas where there are limited sheltering options are also at an increased risk.

Additionally, WE Fest, which takes place in the summer in Detroit Lakes, is a musical festival, which draws crowds of up to 50,000 people to listen to music and camp. A tornado during this event has the potential to affect a large number of people who may be camping out in the open and have limited shelter options.

4.10.6 Tornado and Climate Change in Becker County:

According to the National Center for Atmospheric Research, the main climate change connection to tornadoes is via the basic instability of the low-level air that creates the convection and thunderstorms in the first place. Warmer and moister conditions are the keys for unstable air and the oceans are warmer because of climate change. However, some studies state that trends in severe storms including the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

4.10.7 Relationship to Other Hazards in Becker County:

Tornadoes are related to numerous other hazards. Structural fires have the potential to be related to tornadoes because strong winds from tornadoes may ignite a structural fire. Flood, lightning strikes, and high winds may also cause structural fires in their aftermath. Downed power lines, natural gas leaks or other sources of ignition initiated by tornadoes may spark a fire in structures. Routes to structures may be restricted due to flooding or debris from storms. Tornadoes develop out of thunderstorms, where there is already a steady, upward flow of warm, low-pressure air to get things started, so tornadoes are very strongly related to summer storms. Hail can also occur as part of thunderstorms, which cause tornadoes and can cause damage depending on the size and duration of the hail.

4.11 Windstorms

Windstorms were not identified in the prior hazard mitigation plan from May 2008 for Becker County as a separate hazard but were included as part of the "Summer Storms" risk profile. Windstorms were identified as one of the hazards to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include an in-depth look at what windstorms are, the history of them within Becker County and the potential they have to impact the county residents. A definition of windstorms is provided prior to taking a closer look at the effect hail has on Becker County in order to provide the reader with knowledge of the hazard.

FEMA defines winds in excess of 58 miles per hour, excluding tornadoes, as windstorms. Straight-line winds and windstorms are used interchangeably in the Plan. This hazard is treated as a different category than Tornadoes (which may also include high winds). Windstorms are among the nation's most severe natural hazards in terms of both lives lost and property damaged.

Severe winds can damage and destroy roofs, toss manufactured homes off their pier foundations, and tear light-framed homes apart. There are several different types of windstorms. A "downburst" is defined as a strong downdraft with an outrush of damaging winds on or near the earth's surface. When people experience property damage from a downburst, they often do not believe that "just wind" could have caused the damage, and they assume that they were hit by a tornado. Downbursts may have wind gusts up to 130 mph and are capable of the same damage as a medium-sized tornado. A "gust front" is the leading edge of the thunderstorm downdraft air. It is most prominent near the rain-free cloud base and on the leading edge of an approaching thunderstorm and is usually marked by gusty, cool winds and sometimes by blowing dust. The gust front often precedes the thunderstorm precipitation by several minutes. Straight-line winds, when associated with a thunderstorm, are most frequently found with the gust front. These winds originate as downdraft air reaches the ground and rapidly spreads out, becoming a strong horizontal flow.

Table 75: Effects of Wind Speed

Speed	Effects
25-31 mph	Large branches in motion, whistling in telephone wires
32-38 mph	Whole trees in motion
39-54 mph	Twigs break off of trees, the wind impedes walking
55-72 mph	Damage to chimneys and TV antennas pushes over shallow-rooted trees
73-112 mph	Roof surfaces peel off, windows break, trailer houses overturn
113+ mph	Roofs torn off houses, weak buildings and trailer houses destroyed, large trees uprooted

4.11.1. Windstorm Risk in Becker County:

The overall probability that windstorms will occur each year in Becker County is Likely and its relative impact is Moderate and thus, the overall risk for Becker County is Low. The risk for windstorms for each of the cities is different based upon the location of the city within the County. There have been a greater

number of high wind events in the West portion of Becker County, which includes the cities of Audobon, Callaway, Detroit Lakes, Frazee and Lake Park. In assessing windstorm data for the 2015 update, data from 2009 to 2014 Becker County was used to determine the overall risk of windstorms. The table provided below provides the name of each of the cities in the County, the probability that windstorms will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 76: Windstorm Hazard Risk Assessment

Windstorm			
City	Probability	Impact	Risk
Audubon	Likely	Moderate	Low
Callaway	Likely	Moderate	Low
Detroit Lakes	Likely	Moderate	Low
Frazee	Likely	Moderate	Low
Lake Park	Likely	Moderate	Low
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Possible	Low	Little to No
Total	Likely	Moderate	Low

4.11.2 Windstorm History in Becker County:

Windstorm history in Becker County was obtained from the National Climatic Data Center. Records show high wind events in Becker County in 2010. A comprehensive list of the last 50 years of data can be found in Appendix B. There have been 25 high wind events reported in Becker County in the past 50 years.

According to the National Oceanic Atmospheric Administration, the most recent report of high wind in Becker County was on October 26, 2010. It was reported that in Becker County, a strong area of surface low pressure over central Minnesota on Tuesday morning (26th) continued to deepen and move north during the day. This ended up being a record low-pressure event and also created an intense pressure gradient across eastern North Dakota and portions of northwest and west central Minnesota. Wind speeds across many reporting sites had sustained speeds of 40 mph or wind gusts over 58 mph. This high wind event took place in both East and West Becker County. There was no reported damage, injuries or deaths as a result of this event. However, the potential for future incidents is strong and as such, mitigating against windstorms remains a focus of throughout the county.

Table 77: Windstorms in Becker County from 2009-2014

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	10/26/2010	17:00	CST-6	High Wind	35 kts. MS	0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	10/26/2010	17:00	CST-6	High Wind	35 kts. MS	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Damages to crops from windstorms is another data point that can help determine the vulnerability of a county to windstorms. Included in the 2014 Minnesota All-Hazard Mitigation Plan was the indemnity claims for wind on crops from 2000-2013. Becker County had $61,354 in claims during this timeframe.

4.11.3 Mitigation Actions for Windstorms in Past Five Years in Becker County:

Mitigation actions relating to windstorms in the May 2008 mitigation plan for Becker County included improving communication equipment within the county, assessing the current city sirens and increasing GIS utilization. Additionally, there were mitigation actions related to visitor protection as there is a high number of seasonal visitors during the summer months. Shelters, security, infrastructure, and personnel were all listed in the mitigation objectives.

4.11.4 Vulnerability of Jurisdictions within Becker County:

Becker County attracts many people during the summer months because of the many lakes, resorts, festivals and cabins. This is important information to keep in mind because it means there is a larger population of people who are potentially vulnerable during the summer months to windstorms. , Thus, the added population may require more space, resources or protection.

According to the 2014 Minnesota All-Hazard Mitigation Plan, it was determined that the probability of a high wind event in Minnesota is at least annually. Most occur during the months of April through September. This recurrence is expected to remain relatively stable, although there will be year-to-year fluctuations. Long-term changes in weather patterns may also influence the number of windstorms that occur. The state hazard mitigation plan determined a vulnerability ranking for each county in Minnesota. Becker County was ranked among about a third of the counties in the state with a Medium overall ranking. Medium ranking according to the state plan indicated this ranking reflects less vulnerability based on, in general, less than two wind events per year and compared to building exposure. It was indicated that Becker County has 1.4 events per year greater than 65 knots. The building exposure was listed as $2,486,468,000.

In addition, windstorms have a higher likelihood of occurring in the summer months, so individuals partaking in outdoor recreational activities or working in fields in agricultural jobs would be at an increased risk to windstorms, especially those in the western portion of Becker County.

4.11.5 Windstorm and Climate Change in Becker County:

According to the Federal Advisory Committee Draft National Climate Assessment (NCA), winter storms have increased slightly in frequency and intensity, and their tracks have shifted northward over the U.S. Lack of high-quality long-term data sets make an assessment of changes in wind speeds very difficult (Kunkel, K.E. et al, 2013). One analysis generally found no evidence of significant changes in wind speed

distribution. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain (NCA, page 26). Since the impact of more frequent or intense storms can be larger than the impact of average temperature, “climate scientists are actively researching the connections between climate change and severe storms” (NCA, page 59).

4.11.6 Relationship to Other Hazards in Becker County:

Windstorms are related to summer storms and tornadoes, which both are highly likely to occur in Becker County and there is an extensive history of summer storms and tornadoes occurring each year in Becker County.

4.12 Erosion

Erosion was not identified in the prior hazard mitigation plan from May 2008 for Becker County but was identified as one of the hazards to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include an in-depth look at what erosion is, the history of it within Becker County and the potential has to impact the county residents. A definition of erosion is provided prior to taking a closer look at the effect erosion has on Becker County in order to provide the reader with knowledge of the hazard.

Erosion is a broad subject and is being addressed differently than in the previous version of the state mitigation plan. Coastal erosion along the Lake Superior and landslides were discussed in detail in the previous plan (Coastal erosion along Lake Superior will be discussed after the other geological hazards).

Streambank and bluff erosion were mostly associated with flood or heavy rain conditions. The perspective that caused a shift to look at erosion differently:
Rivers are still adjusting to late glacial events.

- Recent increases in flow lead to a more rapid adjustment.
- Certain reaches of rivers are more sensitive to changes in flow.

Areas that are well beyond and high above the floodplain are susceptible to episodic failure.
Human-caused runoff and sediment add to the natural process.

- Policy makers and homeowners need to look beyond the flood plain and understand and predict bank and bluff failure along the entire meander belts of our rivers.

Erosion hazard as stated in the 1999 FEMA Riverine Erosion Hazard Mapping Feasibility Study, erosion hazard area is defined by Section 577 of National Flood Insurance Reform Act (NIFRA): “Erosion hazard area means, based on erosion rate information and other historic data available, an area of erosion or avulsion is likely to result in damage or loss of property or infrastructure within a 60 year period.”
Stream banks are the portions of the river or stream channel which restrict lateral movement of water. Streambank erosion is a natural process, but the acceleration of this natural process leads to land loss, stream channel instability, increased sediment, habitat loss, and other adverse effects. EPA Stream Channel Erosion EPA, WARSSS, Channel Processes:

> Bluffs are tall steep features distinguished from stream banks based on height. Bluffs are defined as features with greater than 10 feet of relief in 20 foot by 30-foot area. The vertical nature of bluffs makes them susceptible to sudden and catastrophic failure. (Day, Stephanie, 2013, Special Hazard Mitigation Risk Assessment of Near Channel Riverine Erosion Hazards in Blue Earth County – Streambanks, Bluffs, and Ravines) During periods of moderate and high flow, bluffs are eroded by the river in deeply incised channels lacking a floodplain. Bluffs also fail due to landslides and mass wasting. The river removes the soils deposited by mass wasting and landslides. As a result of the eroded, nearly vertical slope cannot stabilize and re-establish itself with vegetation.

Streambank Erosion/Channel Enlargement
Bank erosion takes place by two processes, channel migration, and channel widening (Day, 2013): Enlargement of channels can be caused by combined processes of the incision, bank erosion and direct modification by construction activities. Lateral erosion may occur in stable streams, but the point bar follows at the same rate, thus the stream does not get wider over time. This contrasts with enlargement, where the width of the stream gets wider over time due to lateral erosion, often concurrently on both banks. The

results of enlargement are increased erosion from the stream bed and banks, increased deposition due to decreased shear stress and stream power, loss of habitat, increased water temperatures, and a shift in the evolutionary state of morphological stream types. Increased flows due to watershed changes, storm drains from urban runoff, power generation due to "ramping flows" from reservoir releases and contraction scour below culverts and bridges can all contribute to channel enlargement. Combined processes of the incision, degradation, aggradation, and lateral accretion can be associated with enlargement. EPA, Channel Processes: Channel Enlargement

4.12.1 Erosion Risk in Becker County:

The overall probability that erosion will occur each year in Becker County is Highly Likely and its relative impact is Low and thus, the overall risk for Becker County is Little to No. The risk for erosion for each of the cities is different based on the data available by individual city. In assessing erosion data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that erosion will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings. The most notable are the unincorporated areas of Becker County which has a higher likelihood and a history of erosion.

Table 78: Erosion Hazard Risk Assessment

Erosion			
City	Probability	Impact	Risk
Audubon	Possible	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Possible	Low	Little to No
Frazee	Possible	Low	Little to No
Lake Park	Possible	Low	Little to No
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Highly Likely	Moderate	Moderate
Total	Likely	Low	Little to No

4.12.2 Erosion History in Becker County:

According to the May 2008 Becker County All Hazard Mitigation Plan, closed basin flooding is a concern in Becker County and can lead to erosion. Closed basin lakes provide a threat to land and structures in northeast and southwest Becker County. There are particular lakes in Becker County which are more susceptible to erosion from closed basin flooding. The continuous rise of Bad Medicine Lake has Forest Township extremely concerned. To date, twelve structures have been lost. The bluffs in the area could be at risk to subsidence if the lake reached a high enough level. There is evidence of small slumps in the past. Agricultural and forest land have also been lost. Additionally, Cormorant Lake has been threatened by closed basin lake flooding. Several lake accesses have been ruined including accesses to Big, Middle and

Little Cormorant Lakes. Roads and property have been damaged as well as an increase in shoreline erosion. Juggler Lake in Shell Lake Township also has problems with flooding and the evitable issues erosion that follows such. Erosions will always be an issue for Becker county and as such regulation and education remain a focus of this iteration of the mitigation plan.

4.12.3 Mitigation Actions for Erosion in Becker County in the Past Five Years:

Mitigation actions related to erosion from the May 2008 mitigation plan for Becker County includes enforcing current building and shoreland ordinances and examining the need for changes to current ordinances for increased protection.

4.12.4 Vulnerability of Jurisdictions to Erosion:

Erosion is a problem for parts of Becker County. The main problems are stemming from closed basin flooding of closed basin lakes causing natural erosion/sedimentation. Those most affected live or have property on or near a waterway. The problem of erosion can come on quite suddenly, with land dropping off with little or no warning. Farmers are also at an increased vulnerability because valuable cropland can be affected. As stated in the Community Profile section of this plan, 60.9 percent of the land in Becker County is used for agricultural purposes. Sediment from erosion and run-off from agriculture is a statewide impact.

4.12.5 Erosion and Climate Change in Becker County:

Changes in climate have the potential to impact erosion in Becker County. Natural and human-caused changes in hydrology play a critical role in the failure of stream banks, bluffs, and ravines, as more water is entering ravines and rivers. Land use changes have increased runoff to rivers from urban and agricultural land uses while infiltration and evapotranspiration have been reduced. Vegetation changes, such as conversion of native prairie, pastures, and wetlands to row crops and removing trees and vegetated buffers, reduce soil stability, reduce evapotranspiration and increase runoff. Drainage of surface and subsurface soils for crop production alter hydrology by increasing runoff. Climate and changing summer storm intensity also result in increased runoff and higher flows which worsening near channel erosion.

4.12.6 Relationship to Other Hazards in Becker County:

Wildfires have the potential to be related to erosion. An uncontrolled wildfire can have many long-lasting effects that scar the land. The burned and smoldered land may take years to gain back the habitat and vegetation that once was a representation of it. This bare land is very prone to erosion. The addition of water to this naked landscape can cause landslides, flash floods, and mudflows to occur.

Erosion can also be related to other hazards such as summer storms, because they can cause excessive or prolonged periods of rain which can cause the ground to become susceptible to volumetric change. Drought also has the potential to be related to erosion, because periods of drought can cause shrinkage of soils, which can impact erosion. Additionally, flooding can cause excessive water on the ground which can cause volumetric changes and cause erosion.

4.13 Extreme Heat

Extreme heat was not identified as a separate hazard in the prior hazard mitigation plan from May 2008 for Becker County but was included in the "Drought and Extreme Heat" category. It was identified as a separate hazard to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include a more in-depth look at what extreme heat is, the history of it within Becker County and the potential it has to impact the county residents. A definition of extreme heat is provided prior to taking a closer look at the effect extreme heat has on Becker County in order to provide the reader with knowledge of the hazard.

Extreme summer heat is the combination of very high temperatures and exceptionally humid conditions. If such conditions persist for an extended period of time, it is called a heat wave (FEMA, 1997). Heat stress can be indexed by combining the effects of temperature and humidity. The index estimates the relationship between dry bulb temperatures (at different humidity) and the skin's resistance to heat and moisture transfer - he higher the temperature or humidity, the higher the "feels like" temperature. The major human risks associated with extreme heat are as follows:

- Heatstroke: Considered a medical emergency, heatstroke is often fatal. It occurs when the body's responses to heat stress are insufficient to prevent a substantial rise in the body's core temperature. While no standard diagnosis exists, a medical heatstroke condition is usually diagnosed when the body's temperature exceeds 105°F due to environmental temperatures. Rapid cooling is necessary to prevent death, with an average fatality rate of 15%, even with treatment.
- Heat Exhaustion: While much less serious than heat stroke, heat exhaustion victims may complain of dizziness, weakness, or fatigue. Body temperatures may be normal or slightly to moderately elevated. The prognosis is usually good with fluid treatment.
- Heat Syncope: This refers to the sudden loss of consciousness and is typically associated with people exercising who are not acclimated to warm temperatures. Causes little or no harm to the individual.
- Heat Cramps: May occurs in people unaccustomed to exercising in the heat and generally ceases to be a problem after acclimatization.

In addition to affecting people, severe heat places significant stress on plants and animals. The effects of severe heat on agricultural products may include reduced yields and even loss of crops.

4.13.1 Extreme Heat Risk in Becker County:

The overall probability that extreme heat will occur each year in Becker County is possible and its relative impact is Low and thus, the overall risk for Becker County is Little to No. The risk for extreme heat for each of the cities is different based on the data available to individual city or portion of the county. In assessing extreme heat data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that extreme heat will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determined probability and impact ratings.

Table 79: Extreme Heat Hazard Risk Assessment

Extreme Heat			
City	Probability	Impact	Risk
Audubon	Possible	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Possible	Low	Little to No
Frazee	Possible	Low	Little to No
Lake Park	Possible	Low	Little to No
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Possible	Low	Little to No
Total	Possible	Low	Little to No

4.13.2 Extreme Heat History in Becker County:

The National Oceanic and Atmospheric Administration Storm Events Database indicated there have been two excessive heat events in the past five years in Becker County. These events occurred on July 16, 2011, and occurred in both east and west Becker County. There was no damage incurred or deaths/injuries as a result of this excessive heat event.

Table 80: Extreme Heat Events for Becker County

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	07/16/2011	12:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	07/16/2011	12:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

4.13.3 Mitigation Actions for Extreme Heat in the Past Five Years in Becker County:

There were no mitigation actions stated in the previous plan from May 2008 for extreme heat. However, understanding that impact extreme heat has on vulnerable populations, this iteration of the plan introduces projects to lesson this risk.

4.13.4 Vulnerability in Becker County:

Becker County has numerous outdoor recreational opportunities throughout the summer months which draw large groups of people who are not residents of the county. These recreational opportunities increase the number of people vulnerable to an excessive heat event in Becker County. More specifically, Becker County has many wildlife management areas as well as part of Itasca State Park located within the county lines. Additionally, the Becker County fair is held every year at the fairgrounds in Detroit Lakes. It is

managed by a fair board. There is a grandstand upon the property, as well as bathrooms, electricity, and many buildings/barns. Becker County also has several annual events that draw a huge crowd including WE Fest (a three-day event with 50,000 to 60,000 people a day), Spirit Fest (a three-day event with 15,000 people a day) and the 10,000 Lakes Festival. These attractions are all held at the Soo Pass Ranch and WE Fest amphitheater.

4.13.5 Extreme Heat and Climate Change in Becker County:

Minnesota's average temperature has increased more than 1.5 degrees F since record keeping began in 1895, with increased warming happening in recent decades (Interagency Climate Adaptation Team, p. 4). Annual temperatures in the Midwest have generally been well above the 1901-1960 average since the late 1990s, with the decade of the 2000s being the warmest on record (Kunkel, K.E. et al, 2013). The Midwest has experienced major heat waves and their frequency has increased over the last six decades (Perera et al. 2012). For the U.S., mortality increases 4% during heat waves 2 compared with non-heat wave days (Anderson and Bell 2011). During July 2011, 132 million people across the U.S. were under a heat alert – and on July 20 the majority of the Midwest experienced temperatures in excess of 100°F. Heat stress is projected to increase as a result of both increased summer temperatures and humidity (Schoof 2012).

4.13.6 Relationship to Other Hazards:

Excessive heat spanning over weeks or months could lead to drought conditions within the county, which could have the potential to impact the agricultural industry. As noted in the Community Profile section of this plan, agriculture is a big industry within Becker County and 60.9 percent of the land within the county is used for agricultural purposes. Excessive heat conditions within the county could also have the potential to impact the health of the residents within the county. The elderly and children are the most vulnerable to heat-related illnesses and may not stay adequately hydrated.

4.14 Lightning

Lightning was not identified as a separate hazard in the prior hazard mitigation plan from May 2008 for Becker County but was included in the "Summer Weather" category. It was identified as a separate hazard to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include a more in-depth look at what lightning is, the history of it within Becker County and the potential it has to impact the county residents. A definition of lightning is provided prior to taking a closer look at the effect extreme heat has on Becker County in order to provide the reader with knowledge of the hazard.

Lightning typically occurs as a by-product of a thunderstorm. In only a few millionths of a second, the air near a lightning strike is heated to 50,000°F, a temperature hotter than the surface of the sun.
The hazard posed by lightning is significant. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

According to the National Oceanic and Atmospheric Administration (NOAA), 30 million points on the ground are struck on average each year in the U.S. (NOAA, Severe Weather 101).

Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent killer in the U.S., behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. The lightning current can branch off to strike a person from a tree, fence, pole, or another tall object. In addition, an electrical current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or another tall object. The current may also travel through power lines, telephone lines, or plumbing pipes to damage property or fires.

4.14.1 Lightning Risk for Becker County:

The overall probability that lightning will occur each year in Becker County is possible and its relative impact is Low and thus the overall risk for Becker County is Little to No. The risk for lightning for each of the cities is different based on the data available to individual city or portion of the county. In assessing lightning data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that lightning will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determined probability and impact ratings. Most notable are the cities of Frazee and Detroit Lakes because of their history of lightning events and damage incurred.

Table 81: Lightning Hazard Risk Assessment

Lightning			
City	Probability	Impact	Risk
Audubon	Possible	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Likely	Moderate	Low
Frazee	Likely	Moderate	Low
Lake Park	Possible	Low	Little to No
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Possible	Low	Little to No
Total	Possible	Low	Little to No

4.14.2 History of Lightning in Becker County:

According to the National Oceanic Atmospheric Administration, there have not been any lightning strikes in Becker County in the past five years. The most recent lightning event reported in Becker County was from September 2008 and it occurred in Frazee. The NOAA provided a narrative of this lightning event in Becker County. The NOAA stated that a trough of low pressure crossed into west central Minnesota, helping to fuel scattered thunderstorms. A man driving to work in Detroit Lakes on U.S. Highway 10 was struck by lightning. The strike left marks on the vehicle, but the man was not injured. A rear tire was also blown out and the car's generator was damaged. There was $1,000 in property damage as a result of this lightning event. A list of the lightning events for Becker County from the past 50 years is included in the table below. One can see that Frazee has had the most lightning events in the past 50 years with a total of three. Frazee has also had the most property damage as a result of these events with a total of $36,000 in property damage. Education and forecasting remain a priority in this iteration of the mitigation plan.

Table 82: Lightning Events in Becker County in Past 50 Years

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	56.00K	0.00K
FRAZEE	BECKER CO.	MN	06/28/1997	11:00	CST	Lightning		0	0	30.00K	0.00K
MIDWAY	BECKER CO.	MN	08/14/2000	10:30	CST	Lightning		0	0	5.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/30/2001	10:56	CST	Lightning		0	0	5.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/07/2002	15:00	CST	Lightning		0	0	10.00K	0.00K
FRAZEE	BECKER CO.	MN	10/23/2004	04:00	CST	Lightning		0	0	5.00K	0.00K
FRAZEE	BECKER CO.	MN	09/19/2008	06:10	CST-6	Lightning		0	0	1.00K	0.00K
Totals:								0	0	56.00K	

4.14.3 Mitigation Actions for Lightning for Becker County in the Past Five Years:

Beyond general education and forecasting, there were no mitigation actions listed in the previous plan from May 2008 for lightning. This iteration of the plan focusses on using technology as a forecasting and warning agent.

4.14.4 Vulnerability of Jurisdictions for Lightning:

All humans and structures in the state are vulnerable to damage from lightning. Individual who partake in outdoor recreational activities, or those who work outside, especially during the summer months when lightning is more likely, are at an increased risk. Becker County has numerous outdoor recreational opportunities throughout the summer months which draw large groups of people who are not residents of the county. Becker County has many wildlife management areas as well as part of Itasca State Park located within the county lines. Additionally, the Becker County fair is held every year at the fairgrounds in Detroit Lakes. It is managed by a fair board. There is a grandstand upon the property, as well as bathrooms, electricity, and many buildings/barns. Becker County also has several annual events that draw a huge crowd including WE Fest (a three-day event with 50,000 to 60,000 people a day), Spirit Fest (a three-day event with 15,000 people a day) and the 10,000 Lakes Festival. These attractions are all held at the Soo Pass Ranch and WE Fest amphitheater.

4.14.5 Lightning and Climate Change:

According to the Draft National Climate Assessment (NCA), the projected possible intensity and frequency of tornadoes, hail, and damaging thunderstorm winds, the conditions likely associated with lightning are uncertain (NCA, 2013, p. 26). Severe rain events are becoming more common and may include an additional risk of lightning.

4.14.6 Relationship to Other Hazards:

Lightning has the ability to create forest fires as well as local and large-scale power outages that can be damaging or disruptive to communication systems and electrical systems. These effects of lightning can result in millions of dollars in damage each year. In the Midwest alone costs to repair power and communication systems amount up to $65 million annually (Changnon and Kunkel, 2006).

4.15 Structural Fires

Fire, both structural and wildfires were identified and included in the prior Mitigation Plan from May 2008 for Becker County and structural fires were also identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Additionally, analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what structural fires are the history of structural fires within Becker County and the potential they have to impact the County residents. A definition of fires, structural fires is provided by the Minnesota All Hazard Mitigation Plan from 2014 is provided prior to taking a closer look at the effect structural fires has on Becker County in order to provide the reader with a knowledge of the hazard.

According to the Minnesota All Hazard Mitigation Plan (Accessed 2014), structural fires have many causes: cooking, heating, open flame and arson are the typical leading causes each year. Other causes include careless smoking, misuse of materials, improper storage, equipment / appliance malfunctions, improper building wiring, industrial mishaps, and instances such as train derailments or transportation collisions.

4.15.1 Structural Fire Risk in Becker County:

While the probability of structural fires in Becker County is highly likely, its relative impact is Moderate, and thus, the overall risk for fires in Becker County is Moderate. The risk for fires for each of the cities is different and was determined based upon the specific data collected and outlined in the history section of this hazard profile. In assessing structural fires for the 2015 update, data from 2009 to 2014 was used to determine the risk for Becker County including each of the cities and the county as a whole. Most notables are the cities of Detroit Lakes and unincorporated Becker County, which are at Moderate risk and Wolf Lake, which is at a High risk. These risk potentials are based upon the history of structural fires, which have caused extensive damage to these cities. The table provided below provides the name of each of the cities in the County, the probability that fire will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 83: Fire Hazard Risk Assessment

Fires			
City	**Probability**	**Impact**	**Risk**
Audubon	**Likely**	**Low**	**Little to No**
Callaway	**Likely**	**Low**	**Little to No**
Detroit Lakes	**Highly Likely**	**Moderate**	**Moderate**
Frazee	**Highly Likely**	**Low**	**Little to No**
Lake Park	**Likely**	**Low**	**Little to No**
Ogema	**Likely**	**Low**	**Little to No**
Wolf Lake	**Highly Likely**	**High**	**High**
Becker County	**Likely**	**Moderate**	**Moderate**
Total	**Highly Likely**	**Moderate**	**Moderate**

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents little change from the previous plan. The last plan update was done in May 2008 and indicated

that fire had the potential to have a limited impact on Becker County and no significant threat was posed. This meant that the hazard was found to occur once a year or more and could have limited impact on single or multiple sites in Becker County.

4.15.2 Fire History in Becker County:

The table below outlines the historical structural fires which have taken place in Becker County from the Minnesota Department of Public Safety. The data was provided by the annual Fire in Minnesota Report and is based on numbers provided by Minnesota fire departments. The report includes information on fire causes, fatalities, and trends. More information is below that was provided from the 2013 Fire in Minnesota Report.

Causes

The report states that in the past five years, cooking caused the largest percentage of structure fires (48 percent) with heating and open flame as the second and third leading causes. Cooking, heating, and open flame accounted for 68 percent of total structure fires with known causes. Fires in residential spaces represent 76 percent of all structure fires and 94 percent of fire deaths in structures. Seventy-four percent of civilian injuries occurred in residential fires.

Fatalities

Historically, Minnesotans have been at greatest risk of fire death and injury in their own homes. In 2013, 73 percent of fire deaths and 74 percent of civilian injuries occurred in residential settings. Ninety-four percent of structural fire deaths were in residential property. The presence or absence of working smoke alarms is often a factor in fire fatalities. In 12 percent of fire deaths occurring in dwellings, smoke alarms were not present or not working. In 58 percent of residential deaths, it was not known whether alarms were present or functioning.

Table 84: Structural Fire Data for Becker County from 2007 to 2013

Year	Fire Runs	Other Runs	Total Loss	Fire Rate	Average Loss per Fire	Fire Deaths
2013	208	375	$4,910,135	200	$30,881	1
2012	245	381	$872,250	169	$4,640	0
2011	172	416	$492,808	229	$3,545	1
2010	200	346	$812,520	209	$5,346	0
2009	186	389	$989,200	236	$7,327	3
2008	164	295	$571,900	272	$4,888	0
2007	206	296	$440,000	201	$2,785	1

Source: Fire In Minnesota Report from the State Fire Marshall for years 2007-2013

The table below provides the data by Fire Department within Becker County as well as the number of fires, non-fires and dollar loss per fire department. One can see the Wolf Lake Fire Department responded to the most fires with a total of 58 responses. Carsonville Fire Department responded to the most non-fires, with a total of 156 non-fire responses. Wolf Lake had the largest dollar loss with a total of $3,908,235.

Table 85: Fire Department Responses and Dollar Loss as Reported Via Minnesota Fire Incident Reporting System (MFIRS)

Fire Department	County	Fires	Non-Fires	Dollar Loss
Audubon	Becker	3	2	$435,000
Callaway	Becker	7	10	$0
Carsonville	Becker	33	156	$79,400
Detroit Lakes	Becker	47	155	$481,000
Elbow-Tulaby Lks.	Becker	8	2	$0
Frazee	Becker	27	27	$6,500
Lake Park	Becker	15	11	$0
Ogema	Becker	9	4	$0
White Earth	Becker	1	0	$0
Wolf Lake	Becker	58	19	$3,908,235

Source: Fire in Minnesota Report from the State Fire Marshall for 2013

4.15.3 Presidential Declared Disasters for Structural Fire in Becker County:
There are no reported presidential declared disasters related to fire in Becker County.

4.15.4 Mitigation Actions for the Past Five Years in Becker County:
Mitigation actions for fire from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for the fire was to search for available funding to avoid fire damage and assure adequate evacuation. Mitigation actions for wildfire from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for wildfire was to minimize the amount of fuel in fire-prone areas. The Minnesota Department of Natural Resources (DNR) has also adopted the Firewise Program. As more people build homes in the forests and fields of Minnesota, firefighters are less able to protect people's assets while combating a wildfire. The main view of this program is to protect homes from fire by having the communities resolve potential problems before these problems become fire hazards. Such mitigation activities include thinning of trees, road improvement, and the introduction of additional fire hydrants to deficient areas. Fire prevention remains a focus of this iteration of the mitigation plan with most of the previous actions/projects being continued.

4.15.6 Vulnerability in Becker County:
Structural failures, such as inadequate design, older homes, poor maintenance, natural gas explosion or human factors (neglect or human error), can lead to increased vulnerability to fires. Most structural failures occur within residential homes and low-occupancy buildings where there are fewer people around to notice serious issues that could lead to a collapse or fire. There have been some structural collapses involved in commercial and industrial facilities that have caused numerous fatalities and injuries, but such incidents are rare and are usually due to overloading or design flaws. However, the majority of fatalities due to structure collapse involve residential structures.

4.15.7 Fire and Climate Change in Becker County:
According to the 2014 National Climate Assessment, temperatures are predicted to rise in the state of Minnesota into mid-century and this could lead to more extreme heat events. The increase in a number of extreme heat events could increase loads on electrical grids, causing increasing possibility of structural fires due to overloaded electrical grids. In addition, lightning strikes can cause structural fires and several

types of extreme weather events have already increased in frequency and/or intensity due to climate change, and further increases are projected, according to the 2014 National Climate Assessment.

According to the Minnesota, All Hazard Mitigation Plan from 2014, droughts and associated fires have been happening throughout Minnesota's history. While there was no apparent change in drought duration in the Midwest over the past century (Dai 2010), the average number of days without precipitation is projected to increase in the future (Kunkel, K.E. et al, 2013). Temperatures are predicted to rise, which could lead to more extreme heat events and associated wildfire risks within Becker County.

As the climate changes, weather fluctuations between drought and extreme rain events and increasing temperatures will lead to changes in forest composition and/or distribution. This weather fluctuation can lead to dry conditions that may cause increased fire risk in both grassland and forest environments. National and global studies agree that wildfire risk will increase in the region, but few studies have specifically looked at wildfire potential in the assessment area. At a global scale, the scientific consensus is that fire risk will increase by 10 to 30 percent due to higher summer temperatures (IPCC 2007).

4.15.8 Relationship to other Hazards in Becker County:

Summer storms are related because lighting strikes may ignite a structural fire. Windstorms that result in structural damage to structures increases the fuel load, which may escalate the risk of a structural fire. Flood, tornado, and high winds may also cause structural fires in their aftermath. Downed power lines, natural gas leaks or other sources of ignition initiated by natural hazards may spark a fire in structures. Routes to structures may be restricted due to flooding or debris from storms. Winter storms, such as blizzards or ice storms, may impair the movement of response vehicles and decrease response time to structural fires. The reduced response time could potentially increase the amount of damage.

4.16 Wildfires

Wildfires were identified and included in the prior hazard mitigation plan from May 2008 for Becker County under the “Fire” hazard category. Wildfires were also identified as one of the hazards to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include a more in-depth look at what wildfires are, the history of wildfires within Becker County and the potential they have to impact the county residents. A definition of wildfires from the Minnesota All Hazard Mitigation Plan from 2014 is provided prior to taking a closer look at the effect wildfires have on Becker County in order to provide the reader with knowledge of the hazard.

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing, and possibly consuming structures. Wildfires often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. Wildfires can be caused by humans through acts such as arson or campfires, or can be caused by natural events such as lightning. Wildfires can be categorized into four types. The first type is wildfires that are fueled primarily by natural vegetation in grasslands, brushlands, and forests. The second type is firestorms, which occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted. The third type is interface or intermix fires that occur in areas where both vegetation and structures provide fuel. The fourth and final type are prescribed fires and prescribed natural fires which are intentionally set or natural fires that are allowed to burn for beneficial purposes.

4.16.1 Wildfire Risk in Becker County:

The overall probability that wildfire will occur each year in Becker County is likely and its relative impact is Moderate and thus, the overall risk for Becker County is Low. The risk for wildfire for each of the cities is different based on the data available by individual city. In assessing wildfire data for the 2015 update, data from 2003 to 2013 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that wildfires will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determined probability and impact ratings.

Table 86: Wildfire Risk by City in Becker County

Wildfire			
City	Probability	Impact	Risk
Audubon	Likely	Moderate	Low
Callaway	Likely	Moderate	Low
Detroit Lakes	Likely	Moderate	Low
Frazee	Likely	Moderate	Low
Lake Park	Likely	Moderate	Low
Ogema	Likely	Moderate	Low
Wolf Lake	Likely	Moderate	Low
Becker County	Likely	Moderate	Low
Total	Likely	Moderate	Low

4.16.3 History of Wildfires in Becker County:

According to the Minnesota All Hazard Mitigation Plan, the average number of wildfires per year in Becker County from October 14, 2003, to October 13, 2013, was 54. The average acres burned per fire was 27 and the total cost from 2003-2013 was $6,316,069 for the County.

The National Oceanic Atmospheric Administration did not have any record of wildfires in Becker County from January 1, 1964, to September 30, 2015.

4.16.4 Presidential Declared Disasters for Wildfire:

There are no reported presidential declared disasters related to fire in Becker County.

4.16.5 Mitigation Actions within Becker County in the Past 5 Years:

Mitigation actions for fire from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for the fire was to search for available funding to avoid fire damage and assure adequate evacuation. Mitigation actions for wildfire from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for wildfire was to minimize the amount of fuel in fire-prone areas. The Minnesota Department of Natural Resources (DNR) has also adopted the Firewise Program. As more people build homes in the forests and fields of Minnesota, firefighters are less able to protect people's assets while combating a wildfire. The main view of this program is to protect homes from fire by having the communities resolve potential problems before these problems become fire hazards. Such mitigation activities include thinning of trees, road improvement, and the introduction of additional fire hydrants to deficient areas. Fire prevention remains a focus of this iteration of the mitigation plan with most of the previous actions/projects being continued.

4.16.6 Vulnerability of Jurisdictions within Becker County:

The following factors contribute significantly to wildfire behavior: topography, and weather. With regards to

topography, as slope increases, the rate of wildfire spread increases. South facing slopes are also subject to greater solar radiation, making them drier and thereby intensifying wildfire behavior. However, ridge tops may mark the end of wildfire spread since fire spreads more slowly or may even be unable to spread downhill. Regarding wildfire, the most variable factor affecting wildfire behavior is the weather. Important weather variables are temperature, humidity, the wind, and lightning. Weather events ranging in scale from localized thunderstorms to large fronts can have major effects on wildfire occurrence and behavior. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildfire activity. By contrast, cooling and higher humidity often signal reduced wildfire occurrence and easier containment. In addition, structures in jurisdictions that mix with forests, peat bogs, and prairies are vulnerable to damages to wildfires.

Wildfires have the potential to cause extensive damage and dollar loss to critical infrastructure within the county. Citizens who are elderly, are at an increased risk because if there is a fire, they may have difficulty getting out of their residence or evacuating due to a wildfire without assistance. As noted in the community profile, the elderly population within Becker County was 15% in 2010 and continues to grow.

4.16.7 Wildfire and Climate Change in Becker County:

According to the 2014 National Climate Assessment, temperatures are predicted to rise in the state of Minnesota into mid-century and this could lead to more extreme heat events. The increase in a number of extreme heat events could increase loads on electrical grids, causing increasing possibility of structural fires due to overloaded electrical grids. In addition, lightning strikes can cause structural fires and several types of extreme weather events have already increased in frequency and/or intensity due to climate change, and further increases are projected, according to the 2014 National Climate Assessment.

According to the Minnesota, All Hazard Mitigation Plan from 2014 and information provided by local representatives, droughts and associated fires have been happening throughout Minnesota's history. While there was no apparent change in drought duration in the Midwest over the past century (Dai 2010), the average number of days without precipitation is projected to increase in the future (Kunkel, K.E. et al, 2013). Temperatures are predicted to rise, which could lead to more extreme heat events and associated wildfire risks.

As Minnesota's climate changes, weather fluctuations between drought and extreme rain events and increasing temperatures will lead to changes in forest composition and/or distribution. The northern boreal forest may give way to more deciduous forests or grassland, with a period of dying or diseased trees during the transition. This weather fluctuation can lead to dry conditions that may cause increased fire risk in both grassland and forest environments. National and global studies agree that wildfire risk will increase in the region, but few studies have specifically looked at wildfire potential in the assessment area. At a global scale, the scientific consensus is that fire risk will increase by 10 to 30 percent due to higher summer temperatures (IPCC 2007).

4.16.8 Relationship to other Hazards in Becker County:

Wildfires and structural fires are associated with other hazards such as summer storms, drought, flood and winter storms. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on the state and national forest lands. Drought is an associated hazard because drought conditions cause high temperatures and dry conditions, which can increase the risk of fires. Drought risk potential is equally as likely in all of the cities throughout the county.

4.17 Hazardous Material

Hazardous Material was identified in the prior Hazard Mitigation Plan from May 2008 for Becker County and was identified as one of the hazards to be included in this Becker County Hazard Mitigation Plan update. Additionally, analyses are included in this Becker County Hazard Mitigation Plan update to include a more in-depth look at what hazardous material is the history of it within Becker County and the potential it has to impact the County residents. A definition of hazardous material is provided prior to taking a closer look at the effect hazardous material has on Becker County in order to provide the reader with knowledge of the hazard.

Hazardous materials are materials that if released, can pose a threat to human health or the environment. Hazardous material releases can cause long/short term health effects, damage to property, expensive cleanup/contractor costs, serious injury, and even death. Hazardous materials are stored and transported throughout Minnesota and the Nation in various quantities. Hazardous materials are transported by various methods such as railcars, barges, air cargo and trucks. Hazardous materials incidents can occur in two ways: (1) a release from a bulk storage unit at a fixed facility, and (2) the accidental release of a hazardous material during handling. The handling of a hazardous material includes the transportation, off-loading, and physical handling of the hazardous material.

The release of a hazardous material during handling would most likely be the initial responsibility of the facility or carrier. If the facility or carrier could not contain the release, then resources would need to be mobilized to remediate the release. Once a hazardous material release is recognized, immediate action must be taken to respond to the release to preserve health and safety and reduce the impact to the neighboring community and the environment. Hazardous material releases in highly populated areas could result in either evacuation or "shelter-in-place" situations. A hazardous material release may be a rare occurrence, but one major release could have a significant impact on a region.

Fixed Facilities:

Hazardous materials being used or stored at industrial facilities and in buildings is defined as a *fixed facility* hazardous material release hazard. Fixed facilities include industrial facilities that store hazardous materials required for their processing or facilities that store hazardous materials that result from an industrial process. An uncontrolled release or mishandling of hazardous materials from a fixed facility may result in possible injury or fatality, severe financial loss or liability, contamination, and disruption of critical infrastructure

Transport:

A hazardous material is a substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. Transported hazardous materials are classified into one of nine hazard classes. The hazard class is the category of a hazard assigned to a hazardous material according to 49 CFR 173 and the HMT. If a material falls into any of the following classes it is considered a hazardous material:

- Class 1 – Explosives
- Class 2 -- Gasses
- Class 3 -- Flammable Liquids (and Combustible Liquids)
- Class 4 -- Flammable Solids; Spontaneously Combustible Materials; Dangerous when Wet Materials

- Class 5 -- Oxidizers and Organic Peroxides
- Class 6 -- Toxic Materials and Infectious Substances
- Class 7 -- Radioactive Materials
- Class 8 -- Corrosive Materials
- Class 9 -- Miscellaneous Dangerous Goods

In Minnesota, of the various modes of transporting hazardous materials, rail and truck are by far the most common means of shipment. Interstate freight movement is distributed among rail, truck, and water modes.

Truck:

Although rail transports larger gross tonnage of hazardous materials, the number of truck traffic counts carrying hazardous materials shipments is greater. This is due to the larger volumes involved in a single rail shipment. The majority of hazardous materials transport is conducted on Federal or State highways.

4.17.1 Hazardous Materials Risk in Becker County:

While the probability for hazardous material releases is likely within Becker County, its relative impact is Moderate, and thus, the overall risk for hazardous material releases in Becker County is Low. The risk for hazardous material release was determined based on specific data collected and outlined in the history section of this hazard profile. In assessing hazardous material releases for the 2015 update, data from 2009-2014 for the County was available by cities that have been affected. Most notable are the cities of Audobon, Detroit Lakes, Frazee, and unincorporated Becker County because of the likely probability in these cities. The table provided below provides the name of each of the cities in the County, the probability that hazardous material will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings.

Table 87: Hazardous Materials Risk by City for Becker County

HAZMAT			
City	**Probability**	**Impact**	**Risk**
Audubon	**Likely**	**Moderate**	**Low**
Callaway	**Unlikely**	**Moderate**	**Little to No**
Detroit Lakes	**Likely**	**Moderate**	**Low**
Frazee	**Likely**	**Moderate**	**Low**
Lake Park	**Unlikely**	**Moderate**	**Little to No**
Ogema	**Unlikely**	**Moderate**	**Little to No**
Wolf Lake	**Unlikely**	**Moderate**	**Little to No**
Becker County	**Likely**	**Moderate**	**Low**
Total	**Likely**	**Moderate**	**Low**

*Note frequency data was only available from 1982-2014

The 2015 update utilized the frequency X consequence (R = FC) formula and each jurisdiction has its own unique risk score based on the 28 points of data analyzed. The risk determined for the 2015 update represents a significant change from the previous Plan. The 2015 update indicated there is a low overall

risk for Becker County for hazardous material. Whereas the last Plan update was done in May 2008 indicated that hazardous had the potential to have a substantial major impact on Becker County and a significant threat is posed. This meant that the hazard was found to occur once in five years and could have a substantial major impact on single sites in Becker County.

4.17.2 Hazardous Material History in Becker County:

The data from Becker County for hazardous material incidence from the Right to Know Network for the years of 2009-2014 was gathered as part of this report. During those years, there was a total of 5 hazardous material incidents resulting in 3 fatalities, no other hospitalizations or injuries. There was no need for evacuation, or property damage reported. These 5 incidents took place in the cities of Detroit Lakes, Frazee and Audubon. More recently in 2014, there was only 1 hazardous material incident in Becker County which occurred in the city of Detroit Lakes. This incident did not result in any fatalities, hospitalizations or injuries and there was no reported property damage. The discharger for the incident was Canadian Pacific Railroad.

Source: The Right to Know Network provides data from the Emergency Response Notification System (ERNS) database reported to the National Response Center.

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 included current problems related to hazardous materials in Becker County. Hazardous material accidents were listed as a problem. Routes of transportation such as roads and railroad tracks can carry an increased possibility of hazardous material spills depending on what is being transported. Specifically, the following areas within Becker County were included:

- Burlington Township has an increased possibility of seeing an accident due to a major highway running through it, as well as railroad tracks.
- A railroad spill containing hazardous materials could harm Detroit Lakes as well as cause an isolation of emergency services.
- Frazee has heavy railroad traffic (between five and seven per hour day) and hazardous waste is being carried. If an extreme spill occurred, a lag might develop while people/supplies come from Fargo.

4.17.3 Presidential Declared Disasters for Hazardous Material in Becker County:

There have not been any reported presidential declared disasters related to hazardous material for Becker County.

4.17.4 Mitigation Actions for the Past Five Years in Becker County:

Mitigation actions for hazardous material and contamination from Becker County's May 2008 All Hazard Mitigation Plan stated the mitigation action for hazardous material and contamination was to decrease transportation contamination and spill potential by addressing access and visibility issues caused by long or frequent railroad traffic. The plan also indicated they would reduce contamination occurrences by addressing meth-related problems, completing projects and reducing lake contamination potential. As Meth contamination does not seem to be the issues it was 10 years ago, this issue was eliminated from the mitigation plan. In addition, Becker County and its cities have completed several road projects that will decrease the likelihood of incidents. Furthermore, the county and a private partner just recent conducted a hazardous material incident exercise concerning a major concert venue. Despite these effort during the creation of this plan, the county and a city HAZMAT event ; thus, this iteration of the mitigation plan will include issues directed at mitigating issues of hazardous material and their impact on Becker County.

The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III, was enacted in November 1986 to enable state and local governments to adequately prepare and plan for chemical emergencies. Facilities that have spilled hazardous substances, or that store, use, or release certain chemicals are subject to various reporting requirements. Common EPCRA topics include emergency planning; hazardous chemical inventory reporting; chemical information; toxic chemical release reporting; risk management plans, and the toxics release inventory (TRI) database. The TRI database includes facilities that manufacture (including importing), process, or otherwise use a listed toxic chemical above threshold quantities. Facilities covered by EPCRA must submit an emergency and hazardous chemical inventory form to the Local Emergency Planning Committee (LEPC), the State Emergency Response Commission (SERC) and the local fire department annually. This report also called a Tier I or Tier II, includes basic information including facility identification; employee contact information for emergencies and non-emergencies; and site specific information including facility description, chemical types and descriptions, releases or incidents, and chemical storage capacity, capabilities, and locations.

4.17.5 Vulnerability in Becker County:

Within Becker County, there are areas that are more susceptible to hazardous material spills. Transportation routes, such as roadways and railways within Becker County are more vulnerable. Trains and trucks can carry various hazardous material, which if there was a derailment or crash could pose a threat to those motorists or residents within the area. The areas within the county surrounding pipelines are also vulnerable. Land used for agricultural purposes also has the potential to be more vulnerable because of hazardous material that may be used to treat the land.

4.17.6 Hazardous Material Release and Climate Change:

There is no documented link between hazardous material and climate change.

4.17.7 Relationship to other Hazards in Becker County:

Hazardous material incidences can have an impact on public health. Any hazardous material release or spill has the potential to have an impact on public health or safety.

4.18 Dam / Levee Failure

Dam/Levee failure (stated as Flood Control Structure Failure in the previous plan) was identified in the prior hazard mitigation plan from May 2008 for Becker County and was also identified as one of the hazards to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include a more in-depth look at what dam/levee failure is, the history of it within Becker County and the potential it has to impact the county residents. A definition of dam/levee failure is provided prior to taking a closer look at the effect dam/levee failure has on Becker County in order to provide the reader with knowledge of the hazard.

Dams and levees are an important part of the infrastructure of Minnesota. Dams maintain lake levels and impound water for flood control, power production, and water supply. Levees are used to increase cultivation in agriculture and to protect population and structures from floods. Both structures are artificial barriers that have the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or the control of water. The concern of profiling dams and levees as part of the flooding section is the damage that may result due to a failed structure or overtopping. There are many factors that affect the impact of a failure such as how much liquid is being impounded, the location of structures and critical facilities, intended purpose, and type of construction of the dam or levee. Failure may occur for one or a combination of the following reasons:

- Prolonged periods of rainfall and flooding;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Improper operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway that release water to a downstream dam;
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that can weaken entire structures.

Dams are complicated structures, and it can be difficult to predict how a structure will respond to distress. The modes and causes of failure are varied, multiple, and often complex and interrelated, i.e., often the triggering cause may not have resulted in failure had the dam not had a secondary weakness. These cases illustrate the need for careful, critical review of all facets of a dam. (National Research Council,1983).

A levee is any artificial barrier that will divert or restrain the flow of a stream or other body of water for the purpose of protecting an area from inundation by flood waters. Generally, a levee is subjected to water loading for a few days or weeks in a given year; unlike a dam that is retaining water most days in the same year.

A levee breach results when a portion of the levee breaks away, providing an opening for water to flood the landward side of the structure. Such breaches can be caused by surface erosion due to water velocities, or they can be the result of subsurface actions. Subsurface actions usually involve sand boils whereby the

upward pressure of water flowing through porous soil under the levee exceeds the static pressure of the soil weight above it (i.e., under seepage). These boils can indicate instability of the levee foundation given the liquefied substrate below it, leading way to breaching. Levee overtopping is similar to dam overtopping in that the flood waters simply exceed the design capacity of the structure, thus flowing over the lowest crest of the system. Such overtopping can lead to erosion on the landward side which may then lead to breaching. In order to prevent this type landward erosion, many levees are reinforced or armored with rocks or concrete. The concern with levees is that they may fail when exposed to floodwaters for an unusually long period of time. The prolonged hydraulic forces may weaken the structure to the point of failure unless monitoring and reinforcement measures are being taken.

4.18.1 Dam/Levee Failure Risk in Becker County:

The overall probability that dam/levee failure will occur each year in Becker County is possible and its relative impact is Moderate and thus, the overall risk for Becker County is Low. The risk for dam/levee failure for each of the cities is different based on the data available by individual city and their proximity to dams with higher hazard potential. In assessing dam/levee failure data for the 2015 update, data from 2009 to 2014 Becker County was used to determine the overall risk of dam/levee failure. The table provided below provides the name of each of the cities in the County, the probability that dam/levee failure will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determine probability and impact ratings. Most notable are the cities of Callaway, Ogema and Frazee because of their proximity to dams with a higher hazard potential.

Table 88: Dam/Levee Failure Hazard Risk Assessment

Dam/Levee Failure			
City	Probability	Impact	Risk
Audubon	Possible	Moderate	Low
Callaway	Likely	Moderate	Moderate
Detroit Lakes	Possible	Moderate	Low
Frazee	Likely	Moderate	Moderate
Lake Park	Possible	Moderate	Low
Ogema	Likely	Moderate	Moderate
Wolf Lake	Possible	Moderate	Low
Becker County	Possible	Moderate	Low
Total	Possible	Moderate	Low

4.18.2 Dam/Levee Failure History in Becker County:

There was no record of dam or levee failure in Becker County in the past five years. There are however two dams in Becker County with a significant hazard rating. The first is the South Branch Wild Rice Upper Dam, which is located north of 320 st. and west of highway 59. This dam is located south of Ogema and north of Callaway. This dam was classified as Class 2, which means it has a significant hazard rating. The other dam which was classified as a Class 2, significant hazard rating, was the Frazee Dam, which is located

between in Frazee on E Main St

The following table details all of the dams which are located in Becker County. There is a total of 50 water control structures in Becker County. Additional information provided in this table is the identification number, the status of the dam and whether or not the dam is state regulated. Inspection dates and the date of the next inspection are also included so one can see if an inspection has been recently conducted to ensure safety. The owner of the dam and condition is also stated. Of these 50 dams in Becker County, all but the two previously stated South Branch Wild Rice Upper Dam and Frazee Dam, which have a significant hazard rating, have been assigned a Low hazard rating.

Table 89: List of Dams in Becker County

DAM_NAME	NID_ID	InspectingGroup	Status_of_Dam	State Reg?	Next_Insp_Year	INSP_DATE	InspRptCompDate	Comments	Owner	ConditionAssessment	ConditionAssessmentDetail	Rating
ACORN LAKE	MN00131	Dam Safety	Active	Y	2016	10/21/2008			MNDNR	Satisfactory		Low
AMER FROYSLAND	MN00490	Exempt	Exempt - other	N	Exempt	12/03/2010			Froysland, Amer			Low
AMER FROYSLAND F	MN00491	Exempt	Exempt - no hazard	N	Exempt	05/15/2014	05/27/2014		Froysland, Amer			Low
AMER FROYSLAND-NEW F	MN00830	Dam Safety	Active	Y	2016	10/23/2008			Froysland, Amer	Satisfactory		Low
BALSAM LAKE	MN00621	Federal	Active-Fed	N	Federal				USF&W			Low
BASS LAKE	MN00019	Exempt	Exempt - < 6 feet	N	Exempt			Exempted on Oct 21, 2010, by Jason, height less than 6 feet. Maybe only a beaver dam.	MNDNR	Not Rated	Not under state jurisdiction	Low
Buck's Mill	MN01638	Dam Safety	Active	Y	2018	05/06/2010			MNDNR-Fisheries	Fair		Low
BUFFALO LAKE	MN00123	Dam Safety	Active	Y	2018	10/21/2008			MNDNR	Satisfactory		Low
CHIPPEWA	MN00617	Federal	Active-Fed	N	Federal				USF&W			Low
COTTON LAKE DIVERSION DAM	MN00884	Exempt	Exempt - removed	N	exempt	05/06/2010			MNDNR-Wildlife			Low
DRY LAKE	MN00631	Federal	Active-Fed	N	Federal				USF&W			Low
EUNICE LAKE	MN00124	Dam Safety	Active	Y	2016	05/15/2008			MNDNR	Satisfactory		Low
FLAT LAKE	MN00616	Federal	Active-Fed	N	Federal				USF&W			Low
FRAZEE	MN00130	Exempt	Exempt - removed	N	Exempt	08/21/2001			City of Frazee	Not Rated	Not under state jurisdiction	Significant

HAMDEN GUN CLUB	MN00487	Dam Safety	Active	Y	2016	09/24/2008			Hamden Gun Club	Satisfactory		Low
HEIGHT OF LAND LAKE	MN00021	Dam Safety	Active	Y	2015	07/08/2009			MNDNR-Wildlife	Satisfactory		Low
HUBBEL POND	MN00883	Dam Safety	Active	Y	2016	04/12/2012	01/02/1900	check grass cover, emb settlement over conduit since it failed during construction	MNDNR-Wildlife	Fair		Low
ICE CRACKING LAKE	MN01072	Dam Safety	Exempt - < 6 feet	N	2018	07/23/2010			MNDNR	Fair		Low
Indian Creek	MN01615	Dam Safety	Active	Y	2020	04/12/2012	01/02/1900	Dam Safety checked the site on 4/12/2012 and new weir constructions were completed. Normal storage estimated as 3 times the ponded area.	MNDNR-Fisheries and Wildlife	Satisfactory	Meets applicable hydrologic and seismic regulatory criteria	Low
KATH-1 POND	MN00962	Dam Safety	Active	Y	2016	10/23/2008			Kath, Ted			Low
KATH-2 POND	MN00485	Dam Safety	Active	Y	2016	10/23/2008			Kath, Ted			Low
KOENIG & ELTON F AREA	MN00489	Exempt	Exempt - breached	N	Exempt	10/23/2008			Elton and Koening			
LEHMAN POND	MN00488	Dam Safety	Active	Y	2016	10/01/2008			Lehman, Gary	Satisfactory		Low
Lion's Park	MN00905	Dam Safety	Active	Y	2018	05/06/2010		Rock weir added in 2002. Quitclaim filed by DNR in 2013, City now owns park property but DNR still owns 250'x250' area that contains the dam.	MNDNR	Fair		Low
LITTLE BEMIDJI LAKE	MN00025	Dam Safety	Active	Y	2018	10/13/2010			MNDNR	Fair		Low
LITTLE FLOYD LAKE	MN00126	Dam Safety	Active	Y	2016	10/23/2008			MNDNR	Satisfactory		Low
LITTLE TOAD LAKE	MN00024	Dam Safety	Active	Y	2018	10/13/2010		Concrete cracking and disintegration at abutment corners and piers. Some	MNDNR	Poor		Low

								joint displacement. Major repair in 2000. Beaver issues. AH says stable. Not too bad. Not tilting.				
LONG LAKE	MN00882	Dam Safety	Active	Y	2016	05/15/2008			MNDNR	Satisfactory		Low
MANY POINT LAKE	MN00023	Dam Safety	Active	Y	2016	05/16/2008			MNDNR	Fair		Low
MARSHALL LAKE	MN00144	Dam Safety	Active	Y	2016	10/23/2008			County of Becker	Satisfactory		Low
MELISSA LAKE	MN00127	Exempt	Exempt - removed	N	Exempt	05/06/2010		Dam no longer exists and downstream road culvert mostly controls outflow. Not under state jurisdiction	City of Detroit Lakes	Not Rated	Not under state jurisdiction	Low
MUSKRAT LAKE LOCKS AND DAM	MN00885	Dam Safety	Active	Y	2015	04/06/2007			City of Detroit Lakes	Satisfactory		Low
NELSON POND	MN00492	Dam Safety	Active	Y	2022	08/22/2014	08/27/2014		Nelson, August	Poor	Deficiency Recognized	Low
OGEMASH	MN00619	Federal	Active-Fed	N	Federal				USF&W			Low
RED EYE RIVER	MN01073	Exempt	Exempt - rock weir	N	Exempt			Rock boulder dam? and beaver dam	Nelmark, Tadd			Low
RICE LAKE	MN00926	Federal	Active-Fed	N	Federal				USF&W			Low
ROCK LAKE	MN01074	Exempt	Exempt - < 6 feet	N	Exempt	04/12/2012	01/02/1900	The portion of the structure that remains no long is a dam. Dan Z marked the structure exempt on 4/17/2012.	MNDNR	Poor	Deficiency Recognized	Low
ROUND LAKE	MN00022	Dam Safety	Active	Y	2018	10/13/2010			MNDNR-Trails	Fair		Low
SALLIE LAKE	MN01075	Dam Safety	Exempt - < 6 feet	N	2018	05/06/2010		Rock weir added to right side of the dam. Left side is open.	MNDNR-Fisheries	Fair		Low
SHELL LAKE	MN01076	Dam Safety	Exempt - < 6 feet	N	2022	05/14/2014	05/30/2014	Concrete weathering loss > 4". Cracking & disintigration at abutment corners. LT abutment tipping. Tampering	MNDNR-Forestry	Poor	Dam has not been inspected	Low

								history. WSEL disputes.				
SOUTH BRANCH WILD RICE LOWER	MN00913	Houston Eng	Active	Y	2017	03/23/2012	03/20/2013	Check the gap between low flow inlet pipe and the riser - see Houston Eng inspection report dated 3/20/2012.	WD of Wild Rice			Low
SOUTH BRANCH WILD RICE UPPER	MN00912	Houston Eng	Active	Y	2017	03/23/2012	03/20/2013		WD of Wild Rice	Satisfactory		Significant
SOUTH TAMARACK LAKE	MN00620	Federal	Active-Fed	N	Federal				USF&W			Low
STAKKELHOUSE LAKE	MN00746	Exempt	Exempt - no hazard	N	Exempt	10/15/2009			Gregerson and Peterson	Fair		
STINKING LAKE	MN00916	Houston Eng	Active	Y	2015	10/01/2007			WD of Buffalo-Red River			Low
STRAIGHT LAKE	MN00820	Dam Safety	Active	Y	2016	05/20/2008			MNDNR-Waters	Satisfactory		Low
TOAD LAKE	MN01077	Dam Safety	Active	Y	2016	09/15/2008		Normal storage estimated as 3 times the lake area.	MNDNR	Fair		Low
Town Lake's Outlet	MN01598	Dam Safety	Active	Y	2018	05/06/2010		Ownership unknown.		Satisfactory		Low
TWO INLETS LAKE	MN00020	Dam Safety	Active	Y	2016	05/20/2008			MNDNR	Fair		Low
WHITE EARTH LAKE	MN01000	Dam Safety	Active	Y	2016	07/08/2008			MNDNR-Waters	Satisfactory		Low

4.18.3 Mitigation Actions for Dam/Levee Failure in Past Five Years in Becker County:

There were no mitigation actions specific to dam/levee failure in the Becker County May 2008 plan. This iteration of the plan will focus on integrating existing individual Dam's emergency actions plans into the wider planning efforts to include mitigation planning.

4.18.4 Vulnerability of Jurisdictions within Becker County:

Residents residing or participating in recreation activities near the South Branch Wild Rice Upper Dam and the Frazee Dam could be at an increased risk due to these two dams having a significant hazard rating. However, dam and levee failure is sometimes unpredictable and any people within proximity to a dam, of which there are 50 throughout Becker County, would be potentially vulnerable.

According to the 2014 Minnesota All-Hazard Mitigation Plan, emergency levees are built when floods are predicted. This class of levee protection is not a sound structure unless sandbags or another augmentation

is added. Usually, emergency levees are removed after the flood event to receive Public Assistance funding under Category B. Some communities may have earthen works in a place that were constructed before the flood event. Becker County does not have any emergency levees.

4.18.5 Dam/Levee Failure and Climate Change in Becker County:

Dams are designed based on assumptions about a river's annual flow behavior that will determine the volume of water behind the dam and flow through the dam at any one time. Changes in weather patterns due to climate change may change the hydrograph, or expected flow pattern. Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events are a mechanism that also results in increased discharges downstream. It is conceivable that bigger rainfalls at earlier times in the year could threaten a dam's designed margin of safety, causing dam operators to release greater volumes of water earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream. While climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures. Minnesota had a dam failure due to a large storm event in June 2012. The Forebay canal had operated as designed for nearly 100 years. The intensity of the 2012 rain event caused a failure of the canal wall which caused significant damage. Climate change is adding a new level of uncertainty that needs to be considered with respect to assumptions made during the dam construction.

4.18.6 Relationship to Other Hazards in Becker County:

Dam or levee failures can have a greater environmental impact than that associated with a flood event. Large amounts of sediment from erosion would alter the landscape changing the ecosystem. Hazardous materials are carried away from flooded out properties and distributed throughout the floodplain. Industrial and agricultural chemicals and wastes, solid wastes, raw sewage, and common household chemicals comprise the majority of hazardous materials spread by flood waters along the flood zone, polluting the environment and contaminating everything they come in contact with, including the community's water supply. The soil loss from erosion and scouring would be significantly greater because of a large amount of fast moving water affecting a small localized area, which would likely change the ecosystem.

4.19 Water Supply Contamination

Water Supply Contamination was identified as a hazard in the prior hazard mitigation plan from May 2008 for Becker County. It was identified to be included in this 2015 plan update. Additionally, analyses are included in this 2015 plan update to include a more in-depth look at what water supply contamination is, the history of it within Becker County and the potential it has to impact the county residents. A definition of water supply contamination is provided prior to taking a closer look at the effect water supply contamination has on Becker County in order to provide the reader with knowledge of the hazard.

Water supply contamination is the introduction of point and non-point source pollutants into public groundwater and/or surface water supplies. Microbiological and chemical contaminants can enter water supplies. Chemicals can leach through soils from leaking underground storage tanks, feedlots, improperly cased and managed wells and waste disposal sites. Pesticides from farm fields, manure from feedlots and contaminants from wastewater treatment plants can also be carried to lakes and streams during heavy rains or snow melt.

4.19.1 Water Contamination Risk in Becker County:

The overall probability that water contamination will occur each year in Becker County is possible and its relative impact is Low and thus, the overall risk for Becker County is Little to No. The risk for water contamination for each of the cities is different based on the data available by individual city. In assessing water contamination data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that water contamination will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determined probability and impact ratings. Most notable are the cities of Detroit Lakes and Frazee because of their proximity to potential contamination risks and history of contamination.

Table 90: Water Contamination Risk by City in Becker County

Water Contamination			
City	Probability	Impact	Risk
Audubon	Possible	Low	Little to No
Callaway	Possible	Low	Little to No
Detroit Lakes	Likely	Moderate	Low
Frazee	Likely	Moderate	Low
Lake Park	Possible	Low	Little to No
Ogema	Possible	Low	Little to No
Wolf Lake	Possible	Low	Little to No
Becker County	Possible	Low	Little to No
Total	Possible	Low	Little to No

4.19.2 Water Supply Contamination History in Becker County:

The May 2008 mitigation plan for Becker County stated that the following types of contamination can occur in Becker County:

- Radioactive contamination
- Virus/bacterial contamination
- Pesticide/herbicide contamination
- Organic chemical contamination
- Inorganic chemical contamination

There has been a history of water contamination in Becker County as detailed in the May 2008 mitigation plan.

- Lake St. Claire has a historic water contamination problem due to the fact that it was once used for sewage discharge.
- Lake Sallie also has water quality problems downstream because of ditch #14.
- Long Lake and Little Detroit Lake have current mitigation responses being enacted by the Pelican River Watershed District. These lakes are showing an increased clarity level as well as a decreased algae presence.
- The Pineland Sands area has been noted to have elevated nitrate levels, but no significant high nitrate wells have been found within Becker County.

Old landfills may also pose a threat to Becker County. Historic landfills were not closed according to today's standards. Many chemicals that are illegal today were legal in years past. Some of these landfills have a danger of leaking and contaminating groundwater. The Minnesota Pollution Control Agency (MPCA) has a closed landfill program (CLP) that monitors and mitigates old landfills. Becker County has one landfill in the program. The Becker County landfill contains thirty-three acres and 1,372,000 cubic yards of waste. It stopped receiving waste in July 1990. It is a class A landfill, the highest classification out of four. Class A means that there is an immediate public health or environmental concern. The MPCA states that this landfill potentially impacts residential wells. There is a need to install ground water remediation measures, which Becker County is doing via a Corrective Action Agreement from April 1992.

Previous Problems

The previous Hazard Mitigation Plan for Becker County from May 2008 stated that contamination potential was a problem for Becker County. It stated that the many lakes in Becker County provide a water contamination risk. Intentional contamination from various sources to one lake could pass to other water sources and cause many people/animals to be sick. Specifically, the following were possible sources of contamination.

- Pine Point Township lists that extensive crop spraying could possibly cause a contamination problem.
- Burlington Township listed increased water contamination possibilities due to the nearby Otter Tail River.
- Osage Township has concerns about nitrate coming from the central pivot.
- Cormorant Township says that lake contamination will cause harm to people and animals.
- Forest Township lists a contamination potential in community systems, resorts, and residential shared systems. It was also mentioned that coal-fired power plants are contaminating lake water with arsenic.

Drinking Water Reports by City in Becker County:

City of Audubon

The City of Audubon issued the results of monitoring done on its drinking water for the period from January 1 to December 31, 2013. The information was from the 2013 Drinking Water Report for the City of Audubon. The City of Audubon provides drinking water to its residents from a groundwater source: an 186 foot deep well that draws water from the Quaternary Buried Artesian Aquifer. The Minnesota Department of Health has determined that the source(s) used to supply the drinking water is not particularly susceptible to contamination. No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. There were trace amounts of arsenic, barium, fluoride, copper and lead.

City of Callaway

The City of Callaway issued the results of monitoring done on its drinking water for the period from January 1 to December 31, 2014. This information was provided by the 2014 City of Callaway Drinking Water Report. The City of Callaway provides drinking water to its residents from a groundwater source: two wells ranging from 110-116 feet deep, that draw water from the Quaternary Undifferentiated aquifer. The Minnesota Department of Health has determined that the source(s) used to supply the drinking water is not particularly susceptible to contamination. No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. There were trace amounts of arsenic, barium, combined radium, fluoride, nitrate, TTHM, chlorine, copper, and lead.

City of Detroit Lakes

The City of Detroit Lakes issued the results of monitoring done on its drinking water for the period from January 1 to December 31, 2014. This information was provided by the 2014 City of Detroit Lakes Drinking Water Report. The City of Detroit Lakes provides drinking water to its residents from a groundwater source: four wells ranging from 230-232 feet deep, that draw water from the Quaternary Buried Artesian aquifer. The Minnesota Department of Health has determined that the source(s) used to supply the drinking water is not particularly susceptible to contamination. No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. There were trace amounts of arsenic, fluoride, halo acetic acids, nitrate, TTHM, total coliform bacteria, chlorine, copper, and lead.

City of Frazee

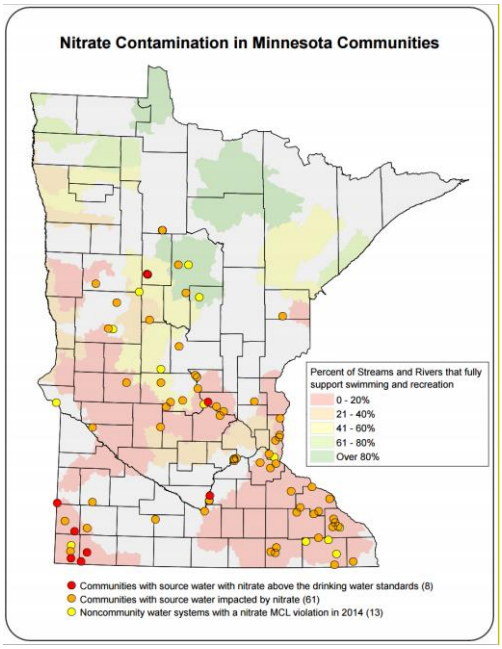
The City of Frazee issued the results of monitoring done on its drinking water for the period from January 1 to December 31, 2014. This information was provided by the 2014 City of Frazee Drinking Water Report. The City of Frazee provides drinking water to its residents from a groundwater source: two wells ranging from 202-210 feet deep, that draw water from the Quaternary Buried Artesian aquifer. The Minnesota Department of Health has determined that the source(s) used to supply the drinking water is not particularly susceptible to contamination. No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. There were trace amounts of barium, fluoride, mercury, nitrate, copper and lead.

Nitrate Levels in Minnesota Drinking Water

According to the State of Minnesota Office of the Governor website a publication dated May 6, 2015, indicated that Governor Mark Dayton and Health Commissioner Dr. Ed Ehlinger released the findings of the state's annual drinking water report, which show nitrate levels in drinking water supplies are of increasing concern in Minnesota. Elevated levels of nitrate – which can lead to Blue Baby Syndrome in infants and other adverse human health effects – have caused an increasing number of Minnesota communities to install expensive nitrate treatment systems to ensure their water supplies are safe to drink. Some communities have resorted to temporarily distributing bottled water to their residents after detecting unsafe levels of nitrates in their drinking water. The report released today, which was compiled by the Minnesota Department of Health (MDH), also shows that as much as 10 percent of small ("non-community") drinking water systems in the state have source water with elevated levels of nitrate – which is a significant cause of concern for human health. The following figure shows that there are no communities with source water impacted by nitrate in Becker County. There are also no communities with source water with nitrate above the drinking water standards. There are also no non-community water systems with nitrate MCL violations in 2014 in Becker County.

The Minnesota Department of Health indicated that it is often difficult to pinpoint where the nitrate in drinking water comes from because there are so many possibilities. The source of nitrate and nitrogen may be from runoff or seepage from fertilized soil, municipal or industrial wastewater, landfills, animal feedlots, septic systems, urban drainage, or decaying plant material. The Minnesota Department of Health website also stated that Federal law requires that public water systems be tested for nitrate, but testing is not required for residential wells. If your infant will be drinking water from a private well, you should have an inexpensive test done for nitrate, in addition to the usual test for bacterial contamination. Many private laboratories can test water samples for nitrates. In some Minnesota counties, well owners can make arrangements with their local public health department to have their wells tested.

Figure 21: Nitrate Contamination in Minnesota Communities



4.19.3 Mitigation Actions for Water Contamination in the Past Five Years in Becker County:

Mitigation actions for hazardous material and contamination from Becker County's May 2008, All Hazard Mitigation Plan stated the mitigation action for hazardous material and contamination was to decrease transportation contamination and spill potential by addressing access and visibility issues caused by long or frequent railroad traffic and removing railroad and vehicle traffic threats in Detroit Lakes. Additionally, another mitigation action was to reduce contamination and hazardous material spill occurrences by addressing meth-related problems and reducing lake contamination potential.

Additionally, it was stated that a law became effective on January 1, 2004, that prohibits the amount of phosphorus fertilizer that is applied to lawns. The main reason for this law is to reduce the amount of phosphorus runoff into lakes, rivers, and streams, cutting water contamination. This is not a ban, but just a reminder to fertilize only when necessary, and exemptions do exist.

Statewide Mitigation Actions

According to the Minnesota Department of Health website, there are a number of programs and services in place in the state of Minnesota to protect groundwater from contamination to keep drinking water supplies are safe for human consumption.

Programs in state and local government agencies are responsible for protecting groundwater from contamination so that drinking water supplies from water are safe for human consumption. The Minnesota Department of Health (MDH) has many roles in this effort including protecting water, ensuring that drinking water from wells is tested and is safe, and recommending cleanup of contaminated sites. Other state agencies also have diverse and important roles in ensuring that the drinking water from wells is safe for human consumption.

Issues water contamination remain a high priority for state of MN and Becker County and while it was previously noted in previous sections (hazardous material risk assessment), that Becker County and its cities have completed several projects that will decrease the likelihood of incidents, education, enforcement and prevention remain a focus in this iteration of the mitigation plan.

4.19.4 Vulnerability to Jurisdictions within Becker County:

Within Becker County, all residents are potentially vulnerable to water supply contamination. Locations where ground water meets surface water and aquifers also have the potential to be vulnerable to water supply contamination. Becker County's old mitigation plan also stated that old landfills may pose a threat to Becker County. Years back, landfills were not closed according to today's standards. Many chemicals that are illegal today were legal in years past. Some of these landfills have a danger of leaking and contaminating groundwater. The Minnesota Pollution Control Agency (MPCA) has a closed landfill program (CLP) that monitors and mitigates old landfills. Becker County has one landfill in the program. Namely the Becker County landfill, which is located in Detroit Lakes near highway 59,and contains thirty-three acres and 1,372,000 cubic yards of waste.

4.19.5 Water Supply Contamination and Climate Change:

According to the Environmental Protection Agency, climate change can have a variety of impacts on

surface water, drinking water, and ground water quality. Higher water temperatures and changes in the timing, intensity, and duration of precipitation can affect water quality. Higher air temperatures (particularly in the summer), earlier snowmelt, and potential decreases in summer precipitation could increase the risk of drought. The frequency and intensity of floods could also increase. In addition, sea level rise may affect freshwater quality by increasing the salinity of coastal rivers and bays and causing saltwater intrusion—the movement of saline water into fresh ground water resources in coastal regions.

4.19.6 Relationships with Other Hazards:

Water supply contamination can be linked to various other hazards. Private wells and community water supplies can become contaminated by human and animal waste from infectious disease. In addition, lakes, streams, pools or water parks could also become contaminated by infectious disease from humans and/or animals. A spill or release of hazardous waste could also have an impact on a surrounding area's water supply. Lastly, wastewater treatment plant failure can occur if facilities are not adequately protected from flooding or protection is compromised. Water supplies can become contaminated by the untreated wastes. Sewer back-up and flood waters can contaminate wells through well cap or vent.

4.20 Transportation Incidents

The following information was provided in the Community Profile Section of this plan and the portions which relate to the Transportation Incidents Hazard Profile are included below.

Roadways
The state of Minnesota has 132,250 miles of roads within the state. 116,232 miles are classified as rural roads and 16,018 are classified as urban. Roads can be divided into state, county, township or municipal types.

In order to protect the integrity and prolong the lifespan of the roads, weight restrictions are imposed on the paved roads in Becker County. Spring weight restrictions are intended to restrict weights on roads when they are most vulnerable to damage (spring is a critical period for roads because the soils and aggregate materials are weak while the frost leaves the road). By State law, all County and Township roads are automatically reduced to five-ton per-axle weight limit (unless posted otherwise) at the same time as spring road restrictions are placed on state highways.

A breakdown of the Rural Functional Classification System for Becker County is given in Table 91. Notice that the vast majority of roads are classified as Local Roads (66%), with lesser percentages in the Major and Minor Collectors (25%), Minor and Principal Arterial (10%), and Principal Arterial (6%) categories. Generally, these percentages are within the suggested guidelines established by the MN/DOT for rural areas.

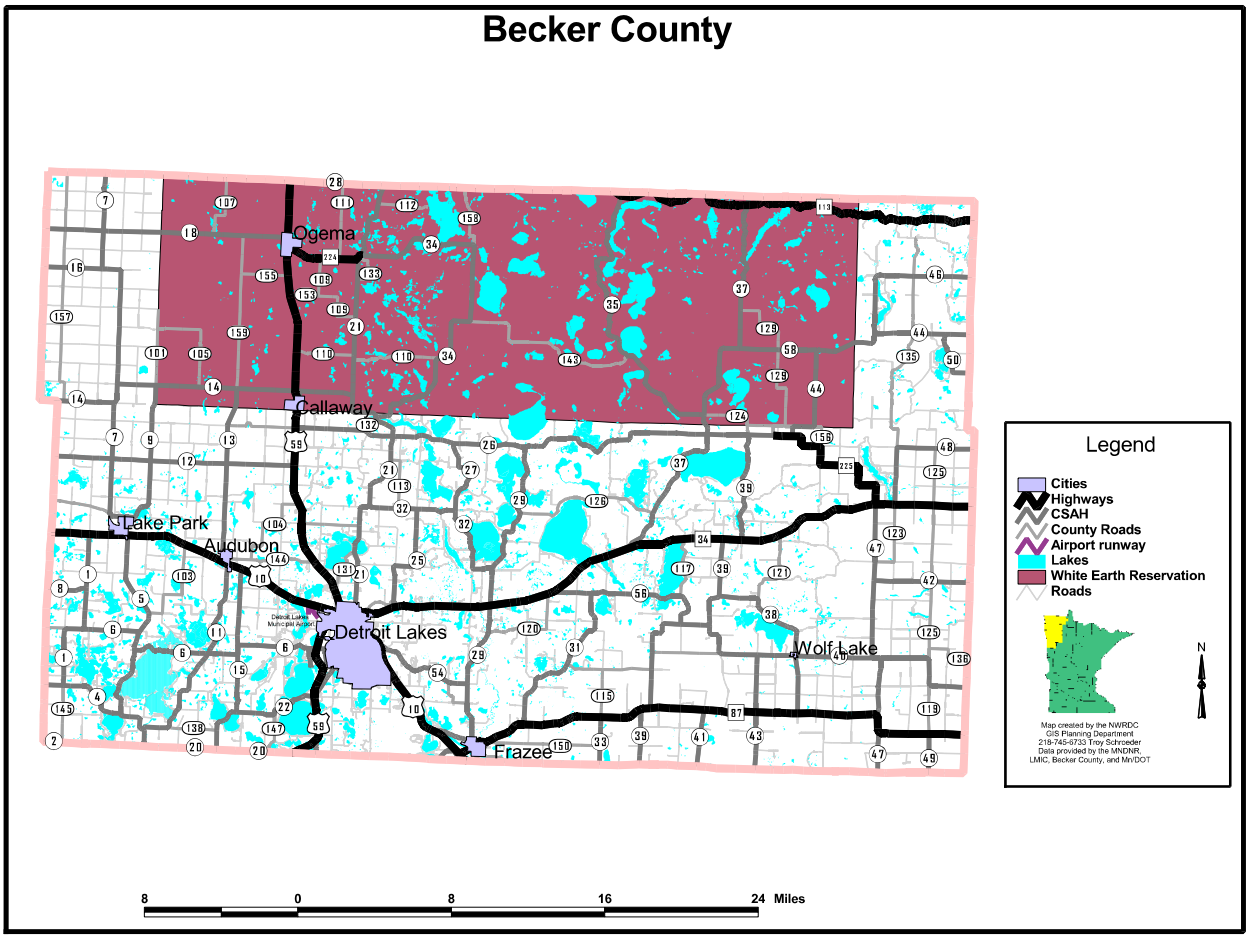
Table 91: Roadway and Mileage in Becker County

Road Type	Becker County (%)	MN/DOT Suggested (%)
Principal Arterial	6	2-4
Minor and Principal Arterial	10	6-12
Major and Minor Collectors	25	20-25
Local Roads	66	65-75

The Minnesota Department of Transportation is responsible for the Minnesota Trunk Highway Systems (MNTH), the state park roads, and the United States trunk highway system (USTH).

The county state aid highway (CSAH) and the county roads are the responsibility of Becker County. All remaining roadways are the responsibility of the township or city that they are located in. Small roadways can cause problems for emergency vehicles.

Figure 22: Becker County Roads



Railroads

Minnesota currently has 4,444 route miles of railroads serviced by 2 freight railroad companies. Northstar commuter rail operates on 40 miles of existing track and right-of-way owned by the BNSF Railway between Big Lake and Minneapolis. Amtrak operates the only intercity passenger rail service in Minnesota on the Empire Builder route connecting Seattle with Chicago.

Minnesota has one operating a light rail line between downtown Minneapolis and the Mall of America in Bloomington. This 12-mile line is owned and operated by Metro Transit. A second 11-mile light rail line is scheduled to open in 2014 between downtown Minneapolis and downtown St. Paul.

Goods between Chicago and ports in the northwest are hauled through Minnesota on railroads. These goods move in both traditional rail cars and increasingly in shipping containers loaded directly onto flatbed rail cars. Grain and lumber are also transported to the Midwest and the rest of the nation and the world. The growth of the oil industry in North Dakota has increased shipments of commodities into, out of and through Minnesota by rail. These commodities include sand, crude oil, and various other products. Ethanol and propane are also transported by railroads in the state. Iron ore and coal are raw materials transported through Minnesota to other parts of the country and the world via rail. Minnesota is fourth in the nation in total tons of commodities originating in the state and eighth in total tons of commodities terminating in the

state.

There are two railroads that service the Becker County area. One of them is the Burlington Northern and Santa Fe railroad (BNSF), a Class I variety with over $256.4 million in annual gross operating revenue. This railroad is 250 miles long in Minnesota (extending from Moorhead to Minneapolis). Twenty-six miles of this cross Becker County. Up to ninety trains a day cross these tracks, some going as fast as seventy-nine miles per hour. The BNSF railroad is one of the fastest and highest volume rail corridors in the state. This rail hauls coal, grain, types of chemicals, lumber, automobiles and containers through the borders.

The Canadian Pacific railroad runs north and south and connects Canada to the upper Midwestern United States. This line is thirty miles long in Becker County and is also a class I. The Canadian Pacific crosses the BNSF in Detroit Lakes, making it a hub of the county. The Canadian Pacific is only a freight railroad, hauling lumber, grain, and fertilizer. Not as busy as the BNSF, about nine trains a day cross Becker County.

Amtrak also manages two passenger trains a day that run through Becker County on BNSF tracks. The county is part of a route that stretches from Chicago to the Seattle/Portland area. These trains stop in Detroit Lakes in the early morning hours. One train goes east, the other goes west.

BNSF has thirty-nine railroad crossings in Becker County. Thirty-eight are at grade crossings (roadway and tracks are at the same elevation) and one is grade separated (road goes over the tracks). Similarly, there is only one grade separated crossing at the Canadian Pacific line, and thirty-two at grade crossings. According to the Becker County Comprehensive Zoning Plan, done in 2003, only twelve crashes between automobile and train have occurred at grade crossings since 1995. Most of these occurred at roads where traffic volume was low. In response to this, MNDOT office of Freight, Railroads & Waterways prepared a comprehensive plan. Specific issues that contribute to railroad crossing accidents in Becker County are listed below:

-Poor visibility
-Poor approach condition
-Poor railroad alignments
-Deficient warning devices
-Poor conditioned signage
-Lack of signage
-Permanent structures blocking the driver's view of the railroad tracks
-Driver distraction
-Changing traffic patterns

The efficiency of a railroad is affected by the physical condition of the rail lines. The Federal Railroad Administration (FRA) track classification is based upon the physical characteristics of the roadbed, track geometry, and track structure. There are four different track classifications with maximum freight and passenger speeds (Table 14). Characteristics related to the roadbed include drainage and vegetation. Track geometry includes gauge, alignment, elevation, and surface. Track structure involves ballast, ties, rail, spikes, joints, and switches. These characteristics determine the allowable operating speeds for each rail line.

The weight restriction of a particular line has a great effect on the movement of grain traveling through the

County. The most efficient means for rail shipment of grain is by 100-ton hopper cars. Such cars have a gross weight of 263,000 pounds. Without access to a rail with strength to handle these hopper cars, a shipper must choose between small rail cars or truck transportation. Both the CP/Soo and BNSF rail lines are designated to handle over 263,000 pounds. As a result, the CP/Soo and BNSF rail lines both bear over 10,000,000 gross tons of freight annually.

Aeronautics
The National Transport Safety Board makes statistics available on a national basis in regards to flight safety. Minnesota specific information was not available. However, the national data indicates that the level of risk for flying is less than land travel in terms of fatalities per 100,000 miles. The impact of an incident involving a large aircraft may be large and involve an integrated response between Fire, EMS, Law Enforcement plus other agencies. Aircraft parked on the tarmac at airports are vulnerable to damage during high wind or hail storm events.

Airports
The Detroit Lakes Airport is the only publicly owned airport that is located in Becker County. There are other numerous airstrips, but these are privately owned. The Detroit Lakes Airport is under the jurisdiction both by the county and the city of Detroit Lakes. It houses between forty-six and fifty aircraft within its hangars. Service provided includes nonscheduled flights, charter service, maintenance/repair and storage. About 14,650 planes either took off or landed at the Detroit Lakes Airport in 2000 (estimate). In 1999, an aviation plan was written documenting needs for this airport, including an extension of 500 feet on the 4,500-foot runway and the construction of a parallel taxiway. Detroit Lakes is a popular vacationing destination. There is a multitude of motels and restaurants nearby. The airport has courtesy rides to town for passengers.

4.20.1 Transportation Incidents History in Becker County:

Vehicle Crash History
2014 Minnesota Motor Vehicle Crash Facts summary provides information on the crashes, deaths, and injuries that occurred on Minnesota roadways during 2014. Data for Becker County indicated that there were three fatal crashes in 2014. There were 115 crashes which resulted in injury during 2014 in Becker County and 171 crashes which resulted in property damage. The total number of crashes in 2014 in Becker County was 289, which was a slight increase from the total of 287 which occurred in 2013.

Additionally, crashes in 2014 are reported for cities over 2,500 or more population as part of the 2014 Minnesota Motor Vehicle Crash Facts Summary. Detroit Lakes is the only city in Becker County with a population over 2,500 people. In 2014, the City of Detroit Lakes had a total of 93 crashes, with no fatalities, 33 injuries, and 60 crashes which were property damage only .

The Minnesota Office of Traffic Safety also provides County-Specific Fact Sheets and the following information was provided by the 2010-2014 Minnesota Crash Statistics for Becker County. In total, there were 1,409 crashes during this time frame and a total of 15 deaths. Of these 15 deaths, 8 were alcohol related, and 6 were due to unbelted motor vehicle incidents. There was a total of 1,202 instances of Driving While Impaired (DWI) in Becker County.

In 2014, Minnesota recorded 91 impaired-related traffic deaths, accounting for 25 percent of all traffic deaths, about the same as in the recent past. Impaired-related crashes, injuries, and fatalities continue to

be a serious problem in Minnesota. Overall, males and young adults are overrepresented in impaired-related crashes and account for a disproportionate share of fatalities. More than 600,000 Minnesotans with driver license records have a DWI.

Other Transportation Incidents
There was no other record of railway or airplane accidents in Becker County during the 2009-2014 timeframe.

4.20.2 Transportation Incident Risk in Becker County:

The overall probability that a transportation incident will occur each year in Becker County is highly likely and its relative impact is Low and thus, the overall risk for Becker County is Little to No. The risk for a transportation incident for each of the cities is the same because data was only available on the county-wide level. In assessing transportation incident data for the 2015 update, data from 2009 to 2014 was used to determine the risk. The table provided below provides the name of each of the cities in the County, the probability that a transportation incident will have an impact on that jurisdiction, the impact potential, as well as the overall risk calculated by the determined probability and impact ratings.

Table 92: Transportation Incident Hazard Risk Assessment

Transportation Incidents			
City	**Probability**	**Impact**	**Risk**
Audubon	**Highly Likely**	**Low**	**Little to No**
Callaway	**Highly Likely**	**Low**	**Little to No**
Detroit Lakes	**Highly Likely**	**Low**	**Little to No**
Frazee	**Highly Likely**	**Low**	**Little to No**
Lake Park	**Highly Likely**	**Low**	**Little to No**
Ogema	**Highly Likely**	**Low**	**Little to No**
Wolf Lake	**Highly Likely**	**Low**	**Little to No**
Becker County	**Highly Likely**	**Low**	**Little to No**
Total	**Highly Likely**	**Low**	**Little to No**

4.20.3 Mitigation Actions for Transportation Incidents in Becker County in the Past Five Years:

While in the previous Becker County plan from May 2008 there were no specific mitigation actions directly associated with the issue of transportation incidents, there were completed projects that had have increased the capacity and or had a mitigating affect. Specifically, the large infrastructure projects dealing with the counties and cities roadways decreased the likelihood of transportation incidents. As such and as it is anticipated the county will continue to have a thriving tourist economy and continue to grow, issues and projects of transpiration remain a focus of the mitigation plan.

4.20.4 Vulnerability to Residents in Becker County:

Any resident who uses the various transportation methods in Becker County including highway, railway, and air are potentially vulnerable to a transportation incident. In addition, residents who live closer to a roadway have the potential to be the victim of someone driving while impaired and potentially driving off the road. Residents who reside near a railway, such as in the city of Detroit Lakes are at an increased risk.

4.20.5 Transportation Incidents and Climate Change:

According to the 2013 Report of the Interagency Climate Adaptation Team report "Adapting to Climate Change in Minnesota," the impacts of climate change on the Department of Transportation (MnDOT) are significant. MnDOT is committed to addressing climate change adaptation in our statewide vision: that Minnesota's multimodal transportation system, "is flexible and nimble enough to adapt to changes in society, technology, the environment, and the economy." Climate issues will affect many functional groups within MnDOT, including Bridge Hydraulics, Water Resources, Maintenance, Design, Construction, Materials, and Freight, Rail, and Waterways.

The predictions for increased frequency and intensity of rainfall events, extreme heat events resulting in decreased air quality, and an increased number of freeze/thaw cycles will affect the way MnDOT designs, builds and maintains the state's multi-modal transportation infrastructure. It will also compel MnDOT to inventory all transportation assets, assess which ones are most vulnerable to the impacts of climate change and determine a cost-effective method to mitigate and minimize those impacts. Emergency preparedness plans will be updated to reflect those lessons learned as a result of recent flash flooding events.

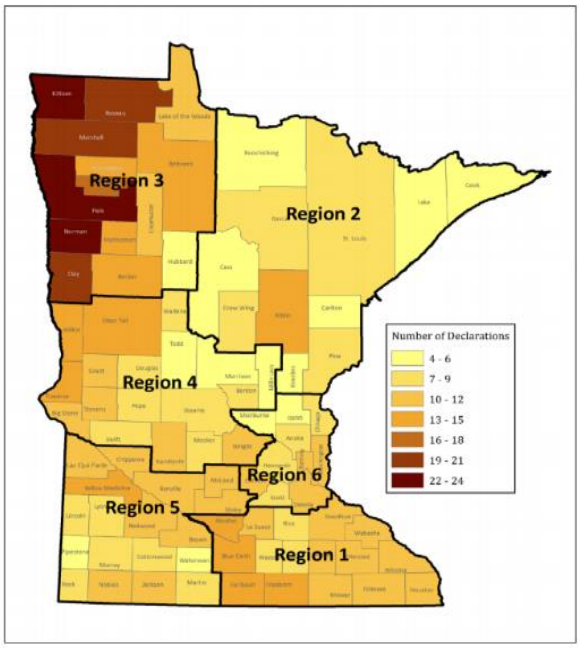
4.20.6 Relationship to Other Hazards:

Hazardous material incidences are generally associated with transportation accidents or accidents at fixed facilities. All highways and railroads associated with transport and anywhere that hazardous material is used or stored are susceptible to a spill. In addition tornadoes, windstorms and winter storms all have the potential to cause high winds or damage to infrastructure which could make roadways impassable. Winter storms also have the potential to make roadways slippery with icy and snowy conditions. Whiteout conditions are also a possibility with winter storms which could lead to increased transportation incidents. These natural hazards, such as tornadoes, windstorms, winter storms, hail and lightning also could cause an increase in railroad or air accidents because of conditions which make it difficult to navigate or cause hazardous conditions.

4.21 Risk Assessment Summary

While the jurisdictional risk varied somewhat from the past plan, one fact remains; Becker is still at risk despite its efforts to mitigate natural hazards. According to the most recent 2014 Minnesota All Hazard Mitigation Plan, Becker County lies within the region in Minnesota that has the highest number of disaster declarations in the entire state. Within Becker County and its participating jurisdictions, the hazards that have the highest number of disaster declarations for the county, have been flooding and summer storms. However, flooding and summer storms have also had the highest amount of mitigation actions, so one can recognize that the county is taking steps towards mitigating the impact and risk of flooding and summer storms on the county.

Figure 23: Disaster Declarations by Region in Minnesota

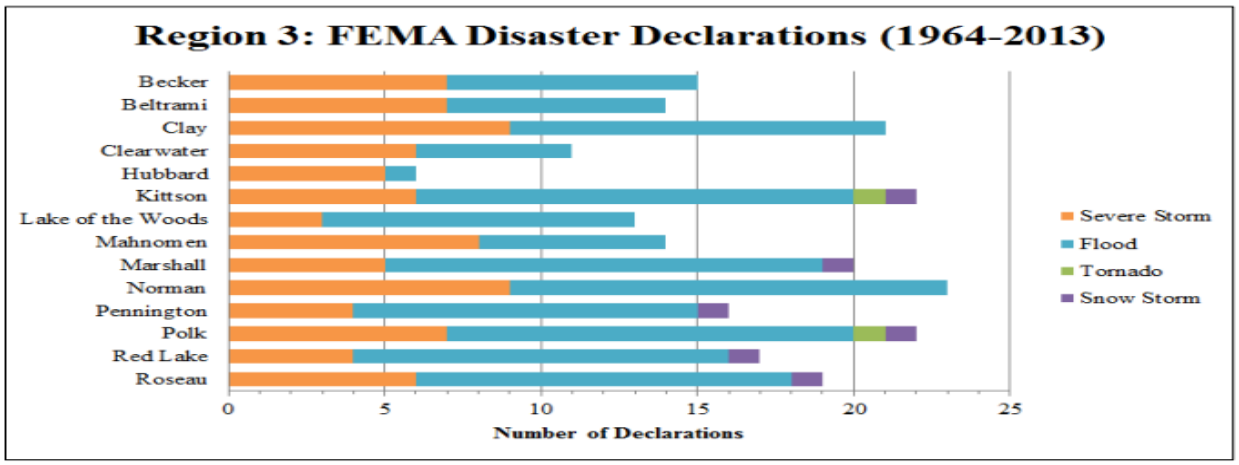


A summary of FEMA Disaster Declarations by County is shown in the following figures

While the past plan evaluated 12 hazards, this updated plan identified 18 hazards as having a potential impact on the community. In taking a more in-depth look at each of the hazards and determining the frequency with which they occur, and calculating the impact and risk potential on the community, mitigation actions can be identified and prioritized accordingly. Of the 18 hazards in Becker County, the hazards with the highest impact potential are structural fire, hail, flood and winter storms. These hazards are highly likely to occur in Becker County each year and have a moderate-risk potential for the community.

Through Becker County's risk analysis, it was determined that the city of Wolf Lake has the highest number of moderate or high impact and risk analysis ratings compared to other cities in the county. Wolf Lake had a moderate impact and risk analysis ratings for the winter storm and hail hazards. Wolf Lake also had a high-risk rating for structural fires. This is important information for mitigation actions and prioritizing Wolf Lake among the other cities in the county. A more detailed look at which hazards were at the High, Moderate, and Low-level prioritization can be seen below in table 93.

Figure 24: FEMA Disaster Declarations (1964-2013)



Within Becker County, the hazards with the highest risk potential are winter storms, and hail. There are seven areas within Becker County, which have a moderate-risk potential for winter storms and hail. These areas are the City of Audubon, the City of Callaway, the City of Detroit Lakes, the City of Frazee, the City of Lake Park, the City of Wolf Lake, and the unincorporated areas of Becker County. The of hail and winter storms do not have the most mitigation actions for Becker County. This indicates the county may need to put more mitigation actions in place for these hazards.

Table 93 shows the hazard prioritization for Becker County as a whole while Tables 94 through 101 show the hazard prioritization for each individual city in Becker County including Audubon, Callaway, Detroit Lakes, Frazee, Lake Park, Wolf Lake, and the unincorporated areas of Becker County.

Table 93: Becker County Hazard Prioritization

Becker County Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Structural Fire • Flood • Hail • Winter Storms
Low	• Drought • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Erosion • Extreme Heat • Lightning • Wildfire • Dam/Levee Failure • Water Contamination • Transportation Incidents

Table 94: City of Audubon Hazard Prioritization

City Audubon Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Winter Storms • Hail
Low	• Drought • Structural Fire • Dam/Levee Failure • Flood • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Erosion • Extreme Heat • Lightning • Water Contamination • Wildfire • Transportation Incidents

Table 95: City of Callaway Hazard Prioritization

City Callaway Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Winter Storms • Dam/Levee Failure • Hail
Low	• Structural Fire • Drought • Flood • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Erosion • Extreme Heat • Lightning • Water Contamination • Wildfire • Transportation Incidents

Table 96: City of Detroit Lakes Hazard Prioritization

City Detroit Lakes Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Flood • Winter Storms • Hail • Structural Fire
Low	• Drought • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Dam/Levee Failure • Erosion • Extreme Heat • Wildfire • Lightning • Water Contamination • Transportation Incidents

Table 97: City of Frazee Hazard Prioritization

City Frazee Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Winter Storms • Dam/Levee Failure • Hail
Low	• Drought • Structural Fire • Flood • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Erosion • Extreme Heat • Lightning • Water Contamination • Wildfire • Transportation Incidents

Table 98: City of Lake Park Hazard Prioritization

City Lake Park Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Flood • Winter Storms • Hail
Low	• Structural Fire • Drought • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Dam/Levee Failure • Erosion • Wildfire • Extreme Heat • Lightning • Water Contamination • Transportation Incidents

Table 99: City of Ogema Hazard Prioritization

City Ogema Hazard Prioritization	
Level	**Hazard**
High	• None
Moderate	• Winter Storms • Dam/Levee Failure • Flood
Low	• Structural Fire • Drought • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Hail • Erosion • Wildfire • Extreme Heat • Lightning • Water Contamination • Transportation Incidents

Table 100: City of Wolf Lake Hazard Prioritization

City Wolf Lake Hazard Prioritization	
Level	**Hazard**
High	• Structural Fire
Moderate	• Winter Storms • Hail
Low	• Drought • Flood • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Tornado • Windstorms • Dam/Levee Failure • Erosion • Extreme Heat • Lightning • Wildfire • Water Contamination • Transportation Incidents

Table 101: Unincorporated Areas of Becker County Hazard Prioritization

Unincorporated Hazard Prioritization for Becker County	
Level	**Hazard**
High	• None
Moderate	• Structural Fire • Flood • Winter Storms • Hail • Erosion
Low	• Drought • Tornado • Hazardous Material • Infectious Disease • Invasive Species • Subsidence • Dam/Levee Failure • Windstorms • Extreme Heat • Lightning • Water Contamination • Wildfire • Transportation Incidents

The aforementioned hazard prioritization were determined by using the best possible information concerning risks and vulnerabilities. The following factors were considered when prioritizing the hazards: Probability or Frequency of a "Disastrous" Event and impacts concerning Casualties/Trauma, Communication/Lack thereof, Continuity of Government, Debris, Emergency Services Disrupted/Limited, Evacuation Needs, Fatalities, Hazardous Material Release, Overwhelm of First Responders, Mass Care Needs, Physical Damage / Asset Destruction, Power, Disruption/Outages, Transportation, Disruption/Failure, and Economic Loss. For more information on these determinations, see the risk assessment methodology and individual hazard profiles.

As with any assessment involving natural or human-caused hazards, not all potential events may be represented here and an actual incident may occur in a vastly different way than described. This assessment, however, will be used where possible, to minimize damages from these events in the future. Every type of event is different, ranging from population to property, to economic impacts. Incidents also have different probabilities and magnitudes even within hazards. For example, a light snowstorm will be different from a blizzard and a moderate flood will be different from both of those. Some hazards have estimates of dollar losses and population impacts, whereas others are more qualitatively assessed, based on the information available during the risk assessment process.

Section 5: Capability Assessment

The purpose of the capability assessment is to determine the ability of a given jurisdiction to implement a mitigation strategy. As in any planning process, it is important to try to figure out what actions are feasible, based on an understanding of those Jurisdictions that are tasked with their implementation. More specifically, the capability assessment helps to determine what mitigation actions are likely to be implemented over time given the fiscal, technical, administrative and political framework of the Jurisdiction. It also provides an opportunity to assess existing plans, policies, and processes in place. A careful analysis was conducted to detect any existing gaps, shortfalls or weaknesses within existing government activities that could exacerbate community vulnerability. The assessment also highlights the positive measures already in place that should continue to be supported.

5.1 Conducting the Capability Assessment

As part of the planning process, the planning team administered a multi-faceted survey to local municipalities and reviewed several plans and past actions that yielded insight into disaster perception and capability. The survey and data, which was filled out and provided by local officials from each participating jurisdiction, posed several questions or provided insight regarding existing local plans, policies, programs or ordinances that contribute to and/ or hinder that county or municipality's ability to implement hazard mitigation actions. As a result, assessment of the participating jurisdictions capabilities was possible.

A general scoring methodology was applied to quantify and rank each jurisdiction's overall capability relative to one another. According to the scoring system, each plan, policy, ordinance or program was assigned a rating based on its relevance to hazard mitigation. Additional points were added based on each county and municipal government's resources specific to their own jurisdiction versus being Countywide and the being updated on a regular interval. A total score and general rating (Limited, Moderate or High) was then determined according to the total number of points received. The general assessment results are summarized in Table. 103 In addition, the results of the assessment serve as a good source of introspection for those jurisdictions that wish to improve their capability.

5.2 Capability Assessment Findings

The Capability Assessment was comprised of two parts:

1) An evaluation of existing plans, policies, and ordinances (Table 102)
2) An assessment of Jurisdictional capabilities. (Table 103)

Part 1: An evaluation of existing plans and policies was conducted as a means to provide insight into how mitigation was achieved in the past as well as how might it be achieved in the future. As such, an audit of the various jurisdictional plans was conducted to determine if and or what plans existed, what plans were comprehensive with the migration process and where additional opportunities existed.

Part 2: The direct capabilities of the participating Jurisdictions were also assessed and rated as being High, Moderate or Limited. The assessment measured the following characteristics: technical, administrative/ institutional, fiscal and political capability.

It is important to note that due to the high degree of variability across Jurisdictional capabilities, the mitigation actions chosen by each jurisdiction in their Mitigation Action Plans will reflect these local abilities and in most instances their ability to collaborate with the County. An additional factor that must be considered is the fact that Becker is a rural County were many of the participating jurisdictions rely on the county as a primary resource.

5.2.1 Hazard Mitigation Plans, Policies, and Ordinances.

The capability survey indicated that there is generally a high degree of existing plans, policies, and ordinances used to conduct mitigation. However, all of the noted resources are shared between the jurisdictions. Thus, in reality, many of the participating jurisdictions have a low technical capability, as they would not be able to function without the noted County and other Regional resources. As a result, local Mitigation Action Plans should be developed that strengthen technical capabilities as well as rely on existing relationships with the county and regional partners.

Recommendation: Jurisdictions must look for ways to differentiate themselves while collaborating with County and regional resources. The development of regional mitigation actions could also be used to assist in this effort.

Table 102: Relevant Plans and Programs in Place

Relevant Plans and Programs in Place	
• HMP: Hazard Mitigation Plan • DRP: Disaster Recovery Plan • CLUP: Comprehensive Land Use Plan • FMP: Floodplain Management Plan • SMP: Stormwater Management Plan • EOP: Emergency Operations Plan • COOP: Continuity of Operations Plan • SARA: SARA Title III Emergency Response Plan • TRANS: Transportation Plan	• CIP: Capital Improvements Plan (that regulates infrastructure in hazard areas) • COMP: comprehensive PLAN • REG-PL: Regional Planning • HPP: Historic Preservation Plan • ZO: Zoning Ordinance • FDPO: Flood Damage Prevention Ordinance • NFIP: National Flood Insurance Program • BC: Building Codes
DENOTES Multi-Jurisdictional Plan	

Jurisdiction	HMP	DRP	CULP	FMP	SMP	EOP	COOP	SARA	TRANS	CIP	COMP	REG-PL	HPP	ZO	FDPO	NFIP	BC	Score
Audubon	X				X	X		X		X	X	X		X			X	L
Calloway	X		X		X	X		X		X	X	X		X			X	L
Detroit Lakes	X		X		X	X		X		X	X	X		X			X	L
Frazee	X				X	X		X		X	X	X		X			X	L
Lake Park	X				X	X		X		X	X	X		X			X	L
Becker Co.	X				X	X		X	X	X	X	X		X	X			L

Note: The inclusion of many of these plans into the Hazard Mitigation process will be a high priority over the past five years.

As part of the Capability Assessment, each Jurisdiction was assessed according to their unique technical, fiscal, administrative and political capabilities. Table 103 provides an overview of each jurisdiction's capabilities. An "L" indicates low capability; an "M" indicated moderate capability, and an "H" indicates high capability.

Table 103: Assessment of Local Capability

Assessment of Local Capability— multi Jurisdictional Hazard Mitigation Plan				
An "L" indicates low capability; an "M" indicated moderate capability; and an "H" indicates high capability.				
Jurisdiction	Technical Capability	Fiscal Capability	Administrative Capability	Political Capability
Audubon	L	L	L	L
Callaway	L	L	L	L
Detroit Lakes	L	L	M	L
Frazee	L	L	L	L
Lake Park	L	L	L	L
Becker Co.	L	L	L	L

5.2.2 Technical Capability

Technical capability can be defined as possessing the skills and tools needed to improve decision-making, including the development of sound mitigation actions. Technical capability can be measured across three primary elements: 1) geographic information systems (GIS) and database management; 2) grants management, and 3) hazard mitigation planning. Measuring the degree to which each element was present throughout the jurisdictions was determined by using a survey, discussions with jurisdictional staff and professional assessment.

The analysis of the responses to the Capability Assessment indicated that there is generally a low technical capability. The result of the technical capability assessment highlights the notion that the existing capability of the Jurisdictions can be improved.

Recommendations: Local Mitigation Action Plans to strengthen technical capabilities of the entire county need to be developed. While there is a wide range of technical resources across the county and municipal governments, the development of a systematic protocol for sharing resources could significantly increase the level of technical capability to analyze natural hazards and develop meaningful actions to reduce their impact. The development of regional mitigation actions could also be used to assist in this effort. It is recommended that the county takes the lead in assisting all of the jurisdictions in enhancing their capabilities

5.2.3 Administrative/ Institutional Capability

The administrative and institutional capability was evaluated by reviewing both the county's and participating jurisdiction's staffing abilities, and the existing organizational structures needed to implement mitigation strategies. The analysis of the responses to the capability assessment indicates there is a low administrative capability throughout the entire county. Thus, the result of the administrative capability

assessment demonstrates that the county, the same administrative capability as the smaller more rural municipalities.

Recommendations: I am strongly recommended to enhance the administrative capacities that the cities and county collaborate with each other as much as possible.

5.2.4 Fiscal Capability

The ability to take action is often closely associated with the amount of resources available to implement policies and projects. This may take the form of grants received or state and locally based revenue. The costs associated with policy and project implementation vary widely. In some cases, policies are tied primarily to staff costs associated with the creation and monitoring of a given program. Other times, the cost are associated with physical aspects of a project. The analysis of the responses to the capability assessment indicated that there is a low fiscal capability at the county and municipal levels respectively.

Recommendations: The factors used in the capability assessment should be used as a general guide to help craft mitigation actions that are achievable. When considering the effect of fiscal capability on the implementation of policies and projects, jurisdictions should ask several basic questions:

- Does the action require a monetary commitment or staff resources?
- Can jurisdictions combine resources with other counties or municipalities to address identified problems?
- Is the jurisdiction willing to commit local revenue on a sustained or one-time basis?

In order to implement mitigation projects and policies, some monetary commitment or staff resources will be required. This may take the form of a non-federal match requirement or the costs associated with staff time devoted to policy development and implementation. The identification of eligible Pre-Disaster Mitigation (PDM) projects, as well as other federal funding sources, are identified in Appendix A of this plan.

County and municipal governments should consider, whenever possible, combining financial and staff resources to address hazards, most of which tend to impact regions rather than individual jurisdictions. Finally, if local governments have access to an ongoing source of revenue, a more comprehensive and sustained effort can be achieved. Examples include the development of various fees such as a stormwater management fee and or the development of a budgetary line item that specifically addresses hazard mitigation.

5.2.5 Political Capability

One of the most difficult and sensitive capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects. According to the results of the assessment, Becker County, and its participating jurisdictions has the same low levels of political capability and thus it may be difficult to enact meaningful and proactive mitigation policies. Observations concerning the county and municipal government officials are such that while there is an interest in disaster mitigation activities, there appears to be a lack of local commitment to take the steps necessary to implement mitigation activities.

Recommendations: Political support from elected officials can prove critically important. When possible, local governments who have implemented hazard mitigation projects should attempt to assess their effectiveness following future events. The ability to document mitigation projects and policies that work is a high priority among FEMA officials. Therefore, local government staff should work with MN HSEM and FEMA officials following disasters to evaluate past mitigation projects. The results should be presented to

locally elected officials in order to provide real-world examples of how mitigation can protect lives and property.

5.2.6 Conclusions on Local Capability

The capability of Jurisdiction's in Becker County is the same from jurisdiction to jurisdiction. As such, no one jurisdiction scored higher than any other jurisdiction. With that being said, one must take into account that the nature of a Rural MN County is that the County is the driving force for most of the incorporated areas within its boundaries. The aforementioned notion is especially true in Becker County. Therefore, an important consideration in this Plan should be the creation of Regional comprehensive planning that works to enhance both the county's capabilities along with its cities.

5.2.7 Linking the Capability Assessment, the Risk Assessment, and the Mitigation Strategy

The conclusions of the capability assessment and risk assessment serve as the foundation for a meaningful hazard mitigation strategy. During the process of identifying the goals and mitigation actions, each jurisdiction must consider not only their level of hazard risk but also their existing capability to minimize or eliminate that risk. In jurisdictions where the overall hazard risk is considered to be HIGH, and local capability is considered Low or Limited, then specific mitigation actions that account for these conditions should be considered. This may include less costly actions such as minor ordinance revisions or public awareness activities. If necessary, specific capabilities may need to be improved in order to better address recurring threats. Similarly, in cases where the hazard vulnerability is Low or limited and overall capability is Moderate or High, more emphasis can be placed on actions that may affect future vulnerability such as guiding development away from known hazard areas. Specific to Becker County, all of the capabilities are low and as such, it may be a struggle to conduct mitigation activities. In instances where there is a high vulnerability, actions that build capacity for the action will be more successful.

Section 6: Mitigation Goals, Objectives, & Strategies

The Mitigation Goals, Objectives, and Strategies section describes how Becker County intends to reduce or eliminate potential losses. The Mitigation Goals, Objectives, and Strategies section provides a framework for the county and participating jurisdictions to mitigate the effects of natural hazard events on their population, economy, and property. The mitigation strategy is the coordinated effort of agencies and partners to develop and implement a comprehensive range of inventive and effective natural hazard mitigation actions.

Mitigation Strategy Approach

- Establish mitigation goals and objectives that aim to reduce or eliminate long-term vulnerability to natural- hazard events
- Identify and analyze a comprehensive range of hazard-specific mitigation strategies that aim to achieve the goals and objectives of the mitigation strategy
- Describe how Becker County and participating jurisdictions will prioritize, implement, and administer mitigation strategies

The Mitigation Goals, Objectives, and Strategy section is an extension of the previous sections of this report and incorporates the findings of the hazards risk assessment to assist in prioritizing mitigation actions. In addition, the Mitigation Goals, Objectives, and Strategies section provide consideration of the findings of the capability assessment to identify mitigation actions that are manageable and address potential capability gaps. Finally, a maintenance and management section describes how the strategies are to be managed and accounted for in future updates.

FEMA Requirements Addressed in this Section

The Hazard Mitigation Planning Team developed the mitigation strategy consistent with the process and steps presented in the Federal Emergency Management Agency's (FEMA) How-To-Guide: Developing the Mitigation Plan (FEMA 386-3).

§201.6(c)(3) [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.

§201.6(c)(3)(i) [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

§201.6(c)(3)(ii) [The hazard mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular

emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

§201.6(c)(3)(iii) [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

§201.6(c)(3)(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

6.1 Mitigation Goals, Objectives, & Development

While Becker County and its city and towns have engaged in several mitigation actions over the past five years, the area remains at risk. As noted in the past iterations of the mitigation plan those hazards posing the most risk due to frequency and impact include fire and severe winter/summer storms. While the risk of fire and severe storms remain high, due to the increase in train derailments within the county and throughout the region, train derailment and hazardous materials being transported through the region, train caused hazardous material releases is an increased risk new to this update.

This plan updates includes the creation of five new all-encompassing mitigation goals versus the 22 individual hazard specific goals that were listed in the immediate past iteration of the plan. In addition, this update eliminates completed projects from the past plan, reassess the validity of past projects as well as adds several new projects. The mitigation projects were derived from the updated community profile, hazard profile, a robust 28-point risk assessment and with the input from the local governments and citizens.

As mitigation strategies for Becker County and participating jurisdictions have shifted from creation of policies and programs to the enhancement of programs and policies, many strategies from the previous planning were not truly completed. Rather, Mitigation strategies from the past plan simply evolved into a refined status that reflects current and anticipated conditions. Thus, this plan continues to builds on and or enhances past projects programs and initiatives. These projects, programs and initiatives include but are not limited to the following:

- Continuing in and expanding the NFIP
- Working with the watersheds to continue managing the areas water recourses
- Continue working with the National Weather Service to educate its citizens.
- Continue updating the County's 911 System by educating the citizens and identifying additional uses
- Incorporate the past road enhancements into comprehensive planning

NOTE: A true account of the plan's past actions was not possible, as the previous plan did not outline who was accountable to catalogue and or track past actions. Exasperating the issue was the loss of institutional

knowledge due to employee turnover. The 2016 iteration of the plan addresses the aforementioned shortcomings by identifying who is accountable for tracking the status of the mitigation projects.

6.2 Strategies/Projects

The process of creating new mitigation projects officially commenced on February 2016 with the Emergency Manager and planning team leading an effort to assess the past mitigation actions in partnership with each of the jurisdictions. Based on the concepts found in FEMA Publication 386-3, these meeting included a mitigation overview, an overview of what mitigation projects, how to identify potential projects, a review the past plan and an overview of the purpose of the mitigation plan as set by FEMA, the State of MN and the Hazard Mitigation Steering Committee. Attendees were instructed to review the existing mitigation goals, objectives, and strategies of the previous plan to determine what had been accomplished over the past five years, what projects were currently relevant and what new projects should be added to the plan update. Subsequently, the Hazard Mitigation Steering Committee, key stakeholders, and public attendees discussed the current mitigation goals, objectives and strategies, and provided feedback on where modifications to the goals, objectives and projects were needed.

In the evaluation of mitigation strategies, stakeholders were instructed to consider the following criteria:

- Funding Options & Cost
- Staff Time
- Feasibility ((the findings of the capability assessment)
- Population Benefit
- Property Benefit
- Values Benefit
- Maintenance
- Hazard Rating

In the evaluation and creation of projects, stakeholders were asked to assess each potential project in terms of eliminating risk and probability of success. Stakeholders were also requested to consider and provide direct and indirect costs and benefits with indirect costs and benefits being defined as intangible things such as social effects.

Upon completion of the mitigation project creation/evaluation process, the stakeholders provided a comprehensive list of desired strategies to the Hazard Mitigation Planning Team who subsequently organized the lists into common themes as well as evaluated and prioritized the submitted projects. Once the arranged actionable projects, the mitigation strategies were shared with stakeholders. Stakeholders were asked to accept, reject, modify, and or re-rank/prioritize the projects.

Once the data from all of the jurisdictions was again received, the Hazard Mitigation Planning Team again reorganized the data into a comprehensive list of strategies. The Hazard Mitigation Planning Team, who refined the list by eliminating duplication, providing succinctness, and generally organizing the strategies into a comprehensive and workable format, then reviewed the list. Once the refinement was complete, the mitigation strategies list was again shared with the participating jurisdictions and stakeholders for additional comment. After all of the comments

were received and incorporated, a final list of strategies was made public for review and comment. The final comment and review section lasted several months, ending May 2016.

The following is a summary of the mitigation update planning process:

1) New goals
2) Prioritization Criteria
3) Implementation Process
4) Projects
5) Mitigation Strategy Implementation and Administration

For this update, the mitigation goals were reorganized to be more general and all encompassing. The goals were also increased from four to five. The mitigation goals were chosen and created by the Steering Committee with input from those wishing to participate.

Mitigation Goals:

- Increase community understanding of emergency management and build support for hazard mitigation
- Develop, promote, integrate and track mitigation strategies
- Continue to improve and enhance the county's emergency management program
- Increase the economic stability, core values, and quality of services of the participating jurisdictions
- Increase mitigation resources to eliminate or minimize harm done to people, property, jobs, and natural resources in Becker County by natural and manmade hazards

6.3 Hazard/Project Relationship

The hazard project relationship table establishes that each of the hazards has at least one project assigned to it. Most hazards have multiple projects assigned to them.

Table 104: Hazards Mitigated by Each Proposed Project

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Educate Citizens concerning Hazards risk	On Going	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Improve storm warning and awareness	On Going		X					X					X	X					

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Promote the use of weather radios	On Going		X					X	X		X	X	X		X				
Encourage no/limited travel during severe weather conditions.	On Going		X																
Encourage the use of online information	On Going	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Increase the use and knowledge of the reverse 911 system	New	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Assess First responder response and readiness capabilities with annual exercise.	On Going	X	X	X				X	X			X	X	X	X		X		
Incorporate Becker County Hazard Mitigation with the Watershed's Water Management Plan	50%	X			X		X			X								X	
Incorporate mitigation with the power company plans. The city of Detroit lakes	New		X					X											

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Eclectic, Ottertail power, Wild rice electric, City of lake park and lake region																			
Incorporate mitigation based on the Comprehensive Plan	New	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ensure that nursing homes, hospitals, public events and schools have updated storm plans, creating them if necessary	New		X					X	X					X	X				
Encourage trailer courts to have either an on-site shelter or an evacuation plan to a nearby shelter	New		X					X	X										
Identify shelters in Becker County and cities for both tornadoes and winter storms	85%		X					X	X										
Encourage individuals to have a shelter plan in place.	On Going		X					X	X										

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Provide information to the public about shelter locations	On Going		X					X	X										
Add & Maintain Appropriate backup power for appropriate critical infrastructure	45%	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Create and or update an enhanced large outage event plan	New		X					X	X			X							
Maintain power lines that have an acute need for mitigation	25%	X	X					X	X										
Continue to bury lines to reduce power outages	10%	X	X					X	X										
Continue to upgrade communication system for emergency response personnel	On Going	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Decrease areas with no cell phone coverage	95%	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Assess the effectiveness and upgrade the current siren warning system	New		X					X	X	X				X					
Provide information for nonresidents about county-related storm risk and shelters locations/operations	On Going		X				X	X											
Annual Assess operations plans of the Soo Pass Ranch, and other big event and festivals	New		X	X	X	X		X	X		X	X	X	X	X			X	X
Repair repetitively damaged roads in Becker County and cities	On Going	X																	
Inventory and repair county roads that suffer continuous damage from flooding events	75%	X																	
Continue working with the White Earth Reservation to	On Going	X																	

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
find a solution for closed basin flooding of Bad Medicine Lake																			
Flood proof structures and roadways along water bodies that are prone to closed basin flooding, considering zoning, buyouts and easements if deemed necessary.	90%	X																	
Assess Enforce and update current floodplain, shoreland and building ordinances.	New	X																	
Utilize firebreaks around affected CRP.	On Going												X						
Utilize controlled burns if the option is available.													X						
Provide information to landowners that may not know about fire prevention	On Going												X	X					

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
methods																			
Continue preventative methods to stop the spread of Jack Pine Disease in the county, so that the resulting dead trees do not provide fuel for a large fire	On Going															X			
Assess and strengthen fire response when necessary.	On Going												X	X					
Enforce any set fire or burning bans	On Going												X	X					
Identify sources of water that could be utilized if shortages occur	On Going				X													X	
Post adequate signage on all railroad crossings	New																		X
Provide access to maps and available routes to first	New	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
responders.																			
Work with the railroad to eliminate long periods of track blockage, reducing isolation or emergency response time increases	75%																		X
Address line of sight problems on roadways	75%																		X
Reassess update train and exercise the procedures for railroad spill-related occurrences.	On Going																		X
Assess and create underpass construction to reduce traffic/railroad encounters	99%																		X
Promote public education on land use practices and contamination reduction	On Going																	X	

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Continue jurisdictional partnerships and associated programs with the Minnesota Dept. of Health, DNR, SWCD and the Buffalo Red River Watershed	On Going																	X	
Continue jurisdictional participation in hospital planning and health efforts	On Going					X		X					X	X	X				
Increase the partnerships currently seen between Emergency Management and Public Health, and incorporate mitigation documented in Public Health planning documents	On Going					X													
Enhance mosquito control in cities	New															X			
Create, update and test a comprehensive pandemic flu plan	50%															X			

Projects	Status	Flood	Severe Winter Storms	Hail	Drought	Infectious Disease	Subsidence	Tornado	Windstorms	Erosion	Extreme Heat	Lightning	Wildfire	Structural Fires	Hazardous Material	Invasive Species	Dam/Levee Failure	Water Contamination	Transportation Incidents
Continue preventative measures to reduce risk concerning agriculture ranching and forestry	On Going															X			
Protect all utilities	New	X	X			X			X	X									
Update Flood mapping	New	X																	
Aqueduct Invasive Species Enforcement education	New															X			

6.4 Project Prioritization

To ensure continuity with best practices the immediate past iteration of the Hazard Mitigation Planning Team decided that the action prioritization methodology should be updated. While the philosophy and methodology were modified from the immediate past iteration of the plan, the overarching concept remained the same. As such, it is again noted that each of the proposed projects has value, however, time and financial constraints do not permit all of the proposed actions to be implemented immediately. By prioritizing the actions, the most critical, cost-effective projects can be achieved in the short term. The prioritization of the projects serves as a guide for choosing and funding projects, however, depending on the funding sources, some actions may be best achieved outside the priorities established here.

To ensure that community goals and other factors are taken into account when prioritizing projects, a prioritization model that uses the following factors was again used: cost, staff time, feasibility, population benefit, property benefit, values benefit, maintenance, and hazard rating.

- **Cost** considers the direct expenses associated with the project such as material and contractor expenses.
- **Staff time** evaluates the amount of time needed by a local government employee to complete or coordinate the project.
- **Feasibility** assesses the political, social, and/or environmental ramifications of the project and the likelihood such a project would proceed through permitting, public review processes, and/or private business implementation.
- **Population benefit** considers the possible prevention of deaths and injuries through the project's implementation.
- **Property benefit** estimates the reduction of property losses, including structures and infrastructure, from the hazard being mitigated.
- **Values benefit** considers the economic, ecologic, historic, and social benefits of the project.
- **Maintenance** rates the amount of work required to keep the mitigation measure effective and useful.
- **Hazard rating** is based on the results of the risk assessment and is a measure of the history, probability, severity, and vulnerabilities of the hazard.

Each of the factors was ranked qualitatively for each of the projects. The methods used to assign a category and the associated score is defined in Table 105. The highest possible score is 30. Some factors have a greater range than others, thus indicating a higher weighting. These weightings allow for appropriate prioritization of the project. More specifically, 11 of 30 points account for benefits (population benefit, property benefit, and values benefit), 11 of 30 points account for direct and indirect costs (cost, staff time, and maintenance), 5 of 30 points account for the hazard rating (incorporates hazard probability and impacts; see Section 4.5), and 3 of 30 points account for project feasibility.

Table 105: Prioritization Criteria

Factor	Threshold	Rating	Score
Cost (Range: 1-5)	Little to no direct expenses	Low	5
	Less than $5,000	Low-Moderate	4
	$5,000-$25,000	Moderate	3
	$25,001-$100,000	Moderate-High	2
	Greater than $100,000	High	1
Staff Time (Range: 1-3)	Less than 10 hours of staff time	Low	3
	10-40 hours of staff time	Moderate	2
	Greater than 40 hours of staff time	High	1
Feasibility (Range: 1-3)	Positive support for the project	High	3
	Neutral support for the project	Moderate	2
	Negative support for the project	Low	1
Population Benefit (Range: 1-4)	Potential to reduce more than 20 casualties	Very High	4
	Potential to reduce 6-20 casualties	High	3
	Potential to reduce 1-5 casualties	Moderate	2
	No potential to reduce casualties	Low	1
Property Benefit (Range: 1-4)	Potential to reduce losses to more than 20 buildings or severe damages to infrastructure	Very High	4
	Potential to reduce losses to 6-20 buildings or substantial damages to infrastructure	High	3
	Potential to reduce losses to 1-5 buildings or slight damages to infrastructure	Moderate	2
	No potential to reduce property losses	Low	1
Values Benefit (Range: 1-3)	Provides significant benefits to economic, ecologic, historic, or social values	High	3
	Provides some benefits to economic, ecologic, historic, or social values	Moderate	2

	No, or very little benefit to economic, ecologic, historic, or social values	Low	1
Maintenance (Range: 1-3)	Requires very little or no maintenance	Low	3
	Requires less than 10 hours per year	Moderate	2
	Requires more than 10 hours per year	High	1
Hazard Rating (Range: 1-5)	See Table XX	High	3
	See Table XX	Moderate	2
	See Table XX	Low	1

The following table provided an overview of all of the projects and priority scorecard. As previously noted the scorecard allows one to determine the feasibility of a project and otherwise prioritize projects.

Table 106: Project Score Card

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Educate Citizens concerning Hazards risk	3	3	3	4	1	1	2	3	20
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Improve storm warning and awareness	3	3	3	4	1	1	2	3	20
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Promote the use of weather radios	4	3	3	4	1	1	3	3	22
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit	Encourage no/limited travel during severe	4	3	2	4	1	1	3	3	21

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Lakes, Frazee, Wolf Lake, Osage	weather conditions.									
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Encourage the use of online information	4	3	3	4	1	2	2	3	22
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Increase the use and knowledge of the reverse 911 system	4	3	3	4	1	1	2	3	21
Becker County Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess First responder response and readiness capabilities with annual exercise.	3	2	3	4	4	1	1	3	21
Becker County	Incorporate Becker County Hazard Mitigation with the Watershed's Water Management Plan	5	3	3	1	1	1	3	2	19
Becker County	Incorporate mitigation with the power company plans. The city of Detroit lakes Eclectic, Ottertail power, Wild rice electric, City of lake park and lake region	5	3	2	1	1	1	3	2	18
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf	Incorporate mitigation based on the Comprehensive Plan	5	3	3	1	4	2	3	2	23

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Lake, Osage										
Becker County and the Cities of Ogema, Lake Park, Audubon, Detroit Lakes, Frazee,	Ensure that nursing homes, hospitals, public events and schools have updated storm plans, creating them if necessary	4	2	2	1	1	2	2	3	17
Becker County and the Cities of, Lake Park, Audubon, Detroit Lakes, Frazee	Encourage trailer courts to have either an on-site shelter or an evacuation plan to a nearby shelter	5	3	2	4	1	2	2	3	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee	Identify shelters in Becker County and cities for both tornadoes and winter storms	5	3	2	4	1	2	2	3	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Encourage individuals to have a shelter plan in place.	4	3	2	4	1	1	2	3	20
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Provide information to the public about shelter locations	4	3	3	4	1	2	2	3	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Add & maintain appropriate backup power for appropriate critical infrastructure	2	2	3	1	3	3	2	3	19
Becker County and the Cities of Ogema,	Create and or update an	4	1	2	1	3	3	2	2	18

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	enhanced large outage event plan									
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Maintain power lines that have an acute need for mitigation	2	2	2	1	1	3	2	2	15
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Continue to bury lines to reduce power outages	2	1	2	1	1	3	2	2	14
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake,	Continue to upgrade communication system for emergency response personnel	3	2	3	4	4	1	2	3	21
Becker County Frazee, Wolf Lake	Decrease areas with no cell phone coverage	1	2	2	1	1	1	3	1	12
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess the effectiveness and upgrade the current siren warning system	3	2	3	3	1	1	2	3	18
Becker County	Provide information for nonresidents about county related storm risk and shelters locations/operations	4	3	3	4	1	3	2	3	23

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Becker County, The City of Detroit Lakes	Annual Assess operations plans of the Soo Pass Ranch, and other big event and festivals	4	2	2	4	1	3	2	2	20
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Repair repetitively damaged roads in Becker County and cities	1	1	3	1	1	3	1	2	13
Becker County	Inventory and repair county roads that suffer continuous damage from flooding events	2	1	3	1	1	3	1	2	14
Becker County Bad Medicine Lake, Forest Township	Continue working with the White Earth Reservation to find a solution for closed basin flooding of Bad Medicine Lake	4	2	3	1	1	2	2	2	17
Becker County Bad Medicine Lake	Flood proof structures and roadways along water bodies that are prone to closed basin flooding, considering zoning, buyouts and easements if deemed necessary.	2	1	2	1	2	3	1	2	14
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess, enforce and update current floodplain, shoreland and building ordinances.	4	2	2	1	4	2	2	2	21

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Becker County	Utilize firebreaks around affected CRP.	4	3	3	4	4	3	2	3	26
Becker County	Utilize controlled burns if the option is available.	4	3	3	4	4	3	2	3	26
Becker County	Provide information to landowners that may not know about fire prevention methods	4	3	3	4	4	3	2	3	26
Becker County	Continue preventative methods to stop the spread of Jack Pine Disease in the county, so that the resulting dead trees do not provide fuel for a large fire	3	2	2	1	1	3	2	3	17
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess and strengthen fire response when necessary.	2	2	3	4	4	3	2	3	25
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Enforce any set fire or burning bans	5	3	3	4	4	3	2	3	27
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Identify sources of water that could be utilized if shortages occur	5	2	3	4	4	3	2	3	26
Becker County and the	Post adequate	4	2	2	4	1	1	2	1	17

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	signage on all railroad crossings									
Becker County & City of Detroit Lakes	Provide access to maps and available routes to first responders.	4	3	3	4	4	1	2	3	25
Becker County and the Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	Work with the railroad to eliminate long periods of track blockage, reducing isolation or emergency response time increases	5	2	2	1	1	1	2	1	15
Becker County, Forest Twp.	Address line of sight problems on roadways	3	2	2	3	1	1	1	1	14
Becker County and the Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	Reassess update train and exercise the procedures for railroad spill-related occurrences.	4	2	2	1	1	1	2	1	14
The City of Detroit Lakes	Assess and create underpass construction to reduce traffic/railroad encounters	1	1	3	1	1	3	1	1	12
Becker County	Promote public education on land use practices and contamination reduction	4	3	3	1	1	2	2	1	17
Becker County	Continue jurisdictional partnerships and associated programs with the	5	3	3	1	1	2	2	2	19

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
	Minnesota Dept. of Health, DNR, SWCD and the Buffalo Red River Watershed									
Becker County	Continue jurisdictional participation in hospital planning and health efforts	5	2	3	1	1	2	2	2	18
Becker County	Increase the partnerships currently seen between Emergency Management and Public Health, and incorporate mitigation documented in Public Health planning documents	5	2	3	1	1	2	2	2	18
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Enhance mosquito control in cities	3	2	3	2	1	3	2	2	18
Becker County	Create, update and test a comprehensive pandemic flu plan	4	2	3	2	1	2	2	2	18
Becker County	Continue preventative measures to reduce risk concerning agriculture ranching and forestry	3	3	3	1	1	3	2	2	18

Jurisdictions	Projects	Cost	Staff Time	Feasibility	Population Benefit	Property Benefit	Values Benefit	Maintenance	Hazard Rating	TOTAL SCORE
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Protect all utilities	2	1	3	1	1	3	2	3	17
Becker County Frazee,	Update Flood mapping	3	1	3	1	2	3	2	2	17
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Aqueduct Invasive Species enforcement and education	3	1	3	1	1	2	2	1	14

6.5 Implementation Process

A critical component of any mitigation program is the implementation of the mitigation projects. The proposed and prioritized projects are shown in Table 107 with the associated responsible stakeholders, resources needed, and goal timeframes for the projects. The timeframes are defined as follows:

- Near Term: Within 0-3 years
- Mid Term: Within 3-6 years
- Long Term: Within 7-10 years
- Ongoing: Initiated in the near, mid, or long term and continuing

Note: Some projects may be best achieved outside of the goal timeframes depending on the funding and staff resources available. Others may not be feasible in the goal timeframe due to financial, staff, or political limitations. This prioritized list, however, allows the county, city, and towns to focus on the projects with the greatest benefits. The following is a table of complete actions in order of their priority score. The Table also illustrates the jurisdiction(s) owning the project, coordinating agency, resources and the goal frame of each project.

6.5.1 Mitigating Projects

Mitigation projects are the foundation of a truly effective emergency management program.

- Mitigation creates safer communities by reducing losses of life and property
- Mitigation enables individuals and communities to recover more rapidly from disasters

- Mitigation lessens the financial impact of disasters on individuals, the Treasury, state, local and tribal communities

Becker County and participating jurisdictions recognize the importance of incorporating mitigation into the overlapping emergency management functions (prepare, respond, recover), existing local and state building codes, zoning ordinances, and various plans (land use, community development, water improvement development, etc.). For this reason, the aforementioned comprehensive all-hazard mitigation strategies also identified strategies that would, and will, improve the county's and participating jurisdiction's emergency management capabilities, while creating communities that are resilient in the face of disaster.

Table 107: Mitigation Projects

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Enforce any set fire or burning bans	Emergency Response Personnel, DNR	Staff Time	Long-Term	27
Becker County	Utilize firebreaks around affected CRP.	Landowner, NRCS	Time	Ongoing, Short-Term	26
Becker County	Utilize controlled burns if the option is available.	Landowner, NRCS	Time	Ongoing, Short-Term	26
Becker County	Provide information to landowners that may not know about fire prevention methods	Fire Departments, Emergency Management, USDA, NRCS	Staff Time	Ongoing, Short-Term	26
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Identify sources of water that could be utilized if shortages occur	Cities, Emergency Management	Staff Time	Long-Term	26
Becker County & City of Detroit Lakes	Provide access to maps and available routes to first responders.	Emergency Response Personnel	Staff Time	Ongoing, Long-Term	25

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess and strengthen fire response when necessary.	Fire Departments, Emergency Management	County/Dept. Budget, Grants, FEMA, HMGP, Staff Time	Long-Term & Ongoing	25
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Incorporate mitigation based on the Comprehensive Plan	Emergency Management, Becker County	Staff Time	Short-Term	23
Becker County	Provide information for nonresidents about county-related storm risk and shelters locations/operations	Emergency Management	Staff Time	Ongoing, Short-Term	23
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Promote the use of weather radios	Emergency Response Personnel, NWS	Staff Time	Ongoing, Long-Term	22
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Encourage the use of online information	Emergency Response Personnel, NWS	Staff Time	Ongoing, Short-Term	22
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess, enforce and update current floodplain, shoreland and building ordinances.	Cities, Becker County	Staff Time	Ongoing, Long-Term	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake,	Continue to upgrade communication system for emergency response personnel	Emergency Response Personnel	County Budget, HMGP, Grants	Ongoing, Long-Term	21
Becker County and	Provide information to the public about shelter	Emergency	Staff Time	Ongoing,	21

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	locations	Management		Short-Term	
Becker County and the Cities of, Lake Park, Audubon, Detroit Lakes, Frazee	Encourage trailer courts to have either an on-site shelter or an evacuation plan to a nearby shelter	Trailer Courts	Staff Time	Long-Term	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee	Identify shelters in Becker County and cities for both tornadoes and winter storms	Emergency Management, Cities, Twps.	Staff Time	Short-Term	21
Becker County Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Assess First responder response and readiness capabilities with annual exercise.	City Emergency Response Personnel	Staff Time	Ongoing, Short-Term	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Increase the use and knowledge of the reverse 911 system	Emergency Management	Staff Time	Ongoing, Long-Term	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Encourage no/limited travel during severe weather conditions.	MNDOT, Emergency Response Personnel	Staff Time	Ongoing, Short-Term	21
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Educate Citizens concerning Hazards risk	Emergency Response Personnel	Staff Time	Ongoing, Short-Term	20
Becker County and the Cities of Ogema, Callaway, Lake Park,	Improve storm warning and awareness	Emergency Response Personnel,	Staff Time	Ongoing, Long-Term	20

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage		NWS			
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Encourage individuals to have a shelter plan in place.	Emergency Management	Staff Time	Ongoing, Long-Term	20
Becker County, The City of Detroit Lakes	Annual Assess operations plans of the Soo Pass Ranch, and other big event and festivals	Emergency Management, Festival Planners	Staff Time, Budgets	Ongoing, Long-Term	20
Becker County	Continue jurisdictional partnerships and associated programs with the Minnesota Dept. of Health, DNR, SWCD and the Buffalo Red River Watershed	DNR, MDH, SWCD, Buffalo Red River Watershed	Budgets, Staff Time	Long-Term	19
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Add & maintain appropriate backup power for appropriate critical infrastructure	Emergency Response Personnel	Staff Time	Ongoing, Long-Term	19
Becker County	Incorporate Becker County Hazard Mitigation with the Watershed's Water Management Plan	Emergency Management, Watershed	Staff Time	Short-Term	19
Becker County	Incorporate mitigation with the power company plans. The city of Detroit lakes Eclectic, Ottertail power, Wild rice electric, City of lake park and lake region	Emergency Management, Power Companies	Staff Time	Short-Term	18
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Create and or update an enhanced large outage event plan	Emergency Management, Critical Infrastructure	Staff Time	Ongoing, Long-Term	18
Becker County and the Cities of Ogema, Callaway, Lake Park,	Assess the effectiveness and upgrade the current siren warning system	Cities, Emergency	Staff Time	Ongoing, Long-Term	18

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage		Management			
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Enhance mosquito control in cities	Emergency Management, Cities	Staff Time	Short-Term	18
Becker County	Create, update and test a comprehensive pandemic flu plan	Emergency Management & Response Personnel, Public Health	Staff Time	Ongoing, Short-Term	18
Becker County	Continue preventative measures to reduce risk concerning agriculture ranching and forestry	County Personnel, Public Health and MN Dept. Of Ag.	Staff Time	Long-Term	18
Becker County	Continue jurisdictional participation in hospital planning and health efforts	Emergency Response Personnel, Public Health	Public Health, HMGP, FEMA, State	Ongoing, Long-Term	18
Becker County	Increase the partnerships currently seen between Emergency Management and Public Health, and incorporate mitigation documented in Public Health planning documents	Emergency Response Personnel, Public Health	Public Health, HMGP, FEMA, State	Ongoing, Short-Term	18
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Protect all utilities	County, Cities and owners of the Utilities	Involved Party Budgets, Staff Time, HMGP, State	Ongoing, Short-Term	17
Becker County Frazee,	Update Flood mapping	County Cities, FEMA	Staff Time HMGP, FEMA	Short-Term	17
Becker County and the Cities of Ogema,	Ensure that nursing homes, hospitals, public events and schools have updated storm	Emergency	Staff Time	Long-Term	17

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Lake Park, Audubon, Detroit Lakes, Frazee,	plans, creating them if necessary	Management			
Becker County	Continue preventative methods to stop the spread of Jack Pine Disease in the county, so that the resulting dead trees do not provide fuel for a large fire	DNR, Forestry Service	Staff Time	Long-Term	17
Becker County and the Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	Post adequate signage on all railroad crossings	Railroad Companies	Railroad Budget	Long-Term	17
Becker County	Promote public education on land use practices and contamination reduction	DNR, MDH	Budgets, Staff Time	Long-Term	17
Becker County Bad Medicine Lake, Forest Township	Continue working with the White Earth Reservation to find a solution for closed basin flooding of Bad Medicine Lake	White Earth Reservation, Bad Medicine Lake, Forest Township	Strategy Dependent	Long-Term	17
Becker County	Promote public education on land use practices and contamination reduction	DNR, MDH	Budgets, Staff Time	Long-Term	17
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Maintain power lines that have an acute need for mitigation	Power Companies	Staff Time	Short-Term	15
Becker County and the Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	Work with the railroad to eliminate long periods of track blockage, reducing isolation or emergency response time increases	Railroad Companies	Railroad Budget	Long-Term	15
Becker County, Forest Twp.	Address line of sight problems on roadways	MNDOT, Engineer, Railroads Becker County and townships	Budgets, Cost Dependent	Long-Term	14

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Becker County and the Cities of Ogema, Callaway, Audubon, Detroit Lakes, Frazee,	Reassess update train and exercise the procedures for railroad spill-related occurrences.	Cities, Emergency Management & Response Personnel		Long-Term	14
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Continue to bury lines to reduce power outages	Power Companies	Budget, FEMA, HMGP, State	Long-Term	14
Becker County	Inventory and repair county roads that suffer continuous damage from flooding events	Emergency Management, MNDOT, Becker County	Staff Time	Ongoing, Short-Term	14
Becker County Bad Medicine Lake	Flood proof structures and roadways along water bodies that are prone to closed basin flooding, considering zoning, buyouts and easements if deemed necessary.	Townships, Watersheds, Lake Residents	Dependent Upon Flood proof Method	Long-Term	14
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit Lakes, Frazee, Wolf Lake, Osage	Aqueduct Invasive Species enforcement and education	County Personnel, Public Health and MN Dept. Of Ag. And MN DNR	Involved Party Budgets, Staff Time	Long-Term	14
Becker County and the Cities of Ogema, Callaway, Lake Park, Audubon, Detroit	Repair repetitively damaged roads in Becker County and cities	MNDOT, Becker County, Emergency	MNDOT/County Funds, FEMA,	Ongoing, Long-Term	13

Jurisdiction	Project	Coordinating Agencies & Partners	Resources Needed	Goal Timeframe	SCORE
Lakes, Frazee, Wolf Lake, Osage		Management	HMGP		
Becker County Frazee, Wolf Lake	Decrease areas with no cell phone coverage	Cell Phone Companies	Cell Company Budget	Long-Term	12
The City of Detroit Lakes	Assess and create underpass construction to reduce traffic/railroad encounters	MNDOT, Engineers, Becker County, Detroit Lakes	Involved Party Budgets, Staff Time	Long-Term	12

The development of this plan has provided Becker County and its participants with a unique opportunity to assess current capabilities, identify gaps, and evaluate the strategies needed to improve the ability to protect the county and participating jurisdictions.

6.5.2 Existing and New Plan Implementation

Becker County and participating jurisdictions feels that it is imperative to make mitigation a way of life for its participating jurisdictions, agencies, and general community. In order to implement sustainable and resilient strategies, it is essential to integrate mitigation into other community planning initiatives. As such, existing planning mechanism was used to assist the Hazard Mitigation Steering Committee and local jurisdictions in identifying areas where hazard mitigation information and/or actions may be incorporated.

During the planning process, the county and participating jurisdictions were asked to investigate opportunities to incorporate mitigation measures that would meet the goals and objectives of this plan as well as the implementation and alignment of the plan into existing programs/policies/plans as outlined in Table 108 shown below (see Capability Assessment).

Table 108: Programs/Policies/Plans

Programs/Policies/Plans	Mitigation Integration/ Alignment Required	Represented Jurisdictions
Audubon Zoning Ordinances	Ongoing	City of Audubon
Callaway Zoning Ordinances	Ongoing	City of Callaway

Programs/Policies/Plans	Mitigation Integration/ Alignment Required	Represented Jurisdictions
Detroit Lakes Zoning Ordinances	Ongoing	City of Detroit Lakes
Frazee Zoning Ordinances	Ongoing	City of Frazee
Lake Park Zoning Ordinances	On going	City of Lake Park
Becker County Comprehensive Plan	Ongoing	All Participating Jurisdictions
Audubon Comprehensive Plan	Ongoing	City of Audubon
Callaway Comprehensive Plan	Ongoing	City of Callaway
Detroit Lakes Comprehensive Plan	On going	City of Detroit Lakes
Frazee Comprehensive Plan	Ongoing	City of Frazee
Lake Park Comprehensive Plan	Ongoing	City of Lake Park
Becker County Growth Policy	Ongoing	All Participating Jurisdictions
Becker County Mitigation Plan	Ongoing	All Participating Jurisdictions
Becker County Emergency Operations Plan	Ongoing	All Participating Jurisdictions
Minnesota State Multi-Hazard Mitigation Plan	Yes I/A	All Participating Jurisdictions
State Building Code	Yes I/A	All Participating Jurisdictions

NOTE: This table represents areas where the plan update may be incorporated. The actual implementation process is outlined below.

One of the implementation steps of the Becker County Hazard Mitigation is to revise all of the aforementioned plans to incorporate the mitigation actions identified in this plan. To accomplish the integration of mitigation actions, the Becker County Emergency Manager will contact the individuals responsible for the above-listed plans, and request that those documents incorporate or reference relevant portions of this plan (See 108).

Revisions to these documents will follow the revision or amendment guidelines established for each plan. In addition, the Becker County Emergency Manager will send a letter to the pertinent organizations to ensure plan incorporation.

Table 109: Jurisdictional Process for Mitigation Incorporation

Jurisdiction	Point of Contact
Becker County	Larry Knutson Commissioner
Audubon	Brad Grant Mayor
Callaway	Gretchen Stalboerger Mayor
Detroit Lakes	Matt Brenk Mayor
Frazee	Donna Ouart Council Member
Lake Park	Keith Zachariason Mayor

As Becker County and the participating cities develop new plans, such as updating ordinances and existing plans are updated, the new plans and updates will utilize the hazard information and projects identified in the Becker County Hazard Mitigation for consideration and inclusion. Given that limited planning mechanisms exist in the county and jurisdictions, the information in this mitigation plan will be valuable for future planning efforts. Table 110 shows examples of projects and how they can be incorporated into existing and future planning documents. Note that some proposed mechanisms may not be feasible at this time due to the staff, technical expertise, and financial resources need to implement the program.

Table 110: Mitigation Strategies

Existing or Anticipated Plan	Mitigation Strategies	Estimated Revision or Creation Timeframe
Building Codes	Adopt building codes that require disaster resistance to hazards such as severe thunderstorms, the wind, tornadoes, floods, wildfire, winter storms, terrorism, and earthquakes.	Near Term*
Capital Improvement Plans	When developed, consider and include projects related to hazard mitigation, such as transportation and public utility infrastructure improvements, in the capital improvements schedule.	Long Term*
Ordinances	Adopt ordinances that create disaster resistance such as mowing and fire reduction ordinances and flood ordinances.	Mid Term
Zoning	Update or create zoning ordinances to limit development in high hazard areas.	Near Term*
Becker County Community Wildfire Protection Plan	Create a plan that meets federal standards and identifies hazards and mitigation measures specific to wildfire.	Mid Term
Becker County Emergency	Integrate the operational, response, training, and preparedness needs that are not directly tied to mitigation into the county's emergency operation	Mid Term

Existing or Anticipated Plan	Mitigation Strategies	Estimated Revision or Creation Timeframe
Operations Plan	plan	
Becker County Growth Policy	Further, incorporate elements of the risk assessment and mitigation strategy into the county's growth policy, considering sustainability and disaster resistance a top priority.	Near Term
Becker County Subdivision Regulations	Include elements of the risk assessment and mitigation strategy in the county's subdivision regulations, considering sustainability and disaster resistance a top priority.	Near Term

Note: Some activities such as building codes and land use regulations are more easily implemented by some communities than others because of the community, planning, and enforcement resources available.

Section 7: Monitor and Maintain the Mitigation Plan

The Plan Maintenance section of Becker County (2016) Hazard Mitigation Plan describes the formal process that will ensure the Becker County Hazard Mitigation remains an effective and relevant document. This section establishes the method and schedule for monitoring, evaluating, and updating the Becker County Hazard Mitigation Plan during a five-year plan update cycle. It also establishes how Becker County will maintain community involvement in the plan.

Plan Maintenance Approach

- Incorporate hazard mitigation actions into existing planning mechanisms
- Determine how mitigation projects and actions will be monitored
- Establish indicators of effectiveness or success
- Develop an evaluation and revision schedule to ensure the Plan is up-to-date at the end of the five-year-cycle
- Establish a process for public input and community involvement during the planning cycle

FEMA Requirements Addressed in this Section

The Becker County Hazard Mitigation Steering Committee created the plan maintenance strategy consistent with the process and steps presented in the Federal Emergency Management Agency's (FEMA) How-To Guide: Bringing the Plan to Life (FEMA 386-4). The following FEMA requirements are addressed in this section:

- ✓ Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a section describing the method and schedule for monitoring, evaluating, and updating the hazard mitigation within a five-year cycle.
- ✓ Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans where appropriate.
- ✓ Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

7.1 Development and Acceptance

Maintaining the Becker County Mitigation Plan is crucial if Becker County is to have a comprehensive mitigation program. As such, this section creates a maintenance timeline, assigning accountability, and creating oversight and governance.

The Hazard Mitigation Planning Team created the monitor and maintains section of the Becker County Hazard Mitigation. The section was presented to the Becker County Emergency Manager for comment and buy in. Upon some very slight modifications, the section was placed on the project website for review and comment. This section was accepted by the Hazard Mitigation Steering Committee and participating jurisdictions on December 2013.

7.2 Process

During the five-year planning cycle, the Becker County Emergency Manager will undertake the following initiatives:

- Collect annual information from the agencies involved in implementing mitigation projects or activities identified in the Mitigation Strategy section of this plan

- Maintain and update the mitigation action table
- Conduct site visits and obtain reports of completed or initiated mitigation actions to incorporate in the plan revision as needed
- Research and document new natural disaster information pertaining to Becker County during the planning cycle and incorporate into a revised risk assessment section as needed
- Organize (at a minimum) annual meetings with each of the participating jurisdictions and county commissioners to discuss relevant hazard mitigation issues, provide status updates, and discuss available grant opportunities
- Organize biannual meetings with mitigation steering committee members to discuss relevant hazard mitigation issues, provide status updates, and discuss available grant opportunities
- Coordinate, compile, and disseminate hazard mitigation funding information and applications
- Convene a meeting of the Hazard Mitigation Steering Committee within a timely period following a natural disaster, when funding is announced to prioritize and submit potential mitigation actions for funding and/or at the direction of the Emergency Manager

The above activities outline plan maintenance during the four years leading up to the fifth year of the planning cycle (2016-2021). Beginning in August 2017, the Becker County Emergency Manager will reconvene the Planning Committee to discuss and update the status of the hazard mitigation actions listed in the plan. The Becker County Emergency Manager will be responsible for ensuring the compilation, documentation, and incorporation of all changes derived from the activities listed above into a revised plan document.

7.3 Evaluation

The Becker County Hazard Mitigation will be evaluated annually to determine the effectiveness of its projects, programs, and policies. The Becker County Emergency Manager will be responsible for scheduling and organize the planning meetings, collecting, analyzing and incorporating annual reports, and providing revised drafts to the Hazard Mitigation Steering Committee. Each year, Hazard Mitigation Steering Committee members will assess the current version of the plan and determine the improvements necessary for the plan update. The Becker County Emergency Manager will evaluate the Hazard Mitigation Steering Committee to determine if other agencies should be added. A thorough examination of the plan will take place during the fifth year of the process to ensure Becker County has an updated hazard mitigation plan at the end of the planning cycle. The Hazard Mitigation Steering Committee will review the goals and action items to determine their relevance to changing situations in the county, as well as changes in state or federal policy, and to ensure they are addressing current and expected conditions. The Hazard Mitigation Steering Committee will look at any changes in county resources that may influence the plan implementation (such as funding), and program changes to determine the need for reassignment. The Hazard Mitigation Steering Committee will review all portions of the plan to determine if this information should be updated or modified given any newly available data.

7.4 Plan Evaluation Criteria

- Are the mitigation actions effective?
- Are there any changes in land development that affect mitigation priorities?
- Do the goals, objectives, and action items meet social, technical, administrative, political, legal, economic, and environmental criteria as defined in FEMA's STAPLEE analysis?
- Are the goals, objectives, and mitigation actions relevant given any changes in Becker County?
- Are the goals, objectives, and mitigation actions relevant given any changes to state or federal regulations or policy?

- Is there any new data that affects the Risk Assessment portion of the Plan?

7.5 Update

The Becker County Emergency Manager will ensure the Hazard Mitigation Steering Committee updates the Becker County Hazard Mitigation every five years to reflect the results of the annual reports and on-going plan evaluation. Throughout the planning cycle, the Becker County Emergency Manager will ensure that new information is compiled and incorporated into the plan. The Becker County Emergency Manager will also incorporate recommended comments expressed by FEMA in the initial review into the plan revision. At the end of the planning cycle, the Hazard Mitigation Steering Committee will submit the updated plan to the State Emergency Management Office and FEMA for review. After FEMA has approved the plan, the county will again formally adopt the plan. The following table is an outline of how the plan will be updated upon FEMA-approval:

Table 111: Plan Update Schedule

Plan Update Schedule		
Timeframe	**Participant**	**Outcome**
First Quarter 2017	Hazard Mitigation Steering Committee Participating Jurisdictions	Reconvene Planning Committee to discuss mitigation action progress and possible plan improvements.
First Quarter 2018	Hazard Mitigation Steering Committee Participating Jurisdictions	Reconvene Planning Committee to discuss mitigation action progress and possible plan improvements.
First Quarter 2019	Hazard Mitigation Steering Committee Participating Jurisdictions	Reconvene Planning Committee to discuss mitigation action progress and possible plan improvements.
Fourth Quarter 2019	Hazard Mitigation Steering Committee Participating Jurisdictions County Commissioners	Apply for plan update grant funding
First Quarter 2020	Hazard Mitigation Steering Committee Participating Jurisdictions	Reconvene Planning Committee to discuss mitigation action progress and possible plan improvements.
Fourth Quarter 2020	Hazard Mitigation Steering Committee Participating Jurisdictions MN HSEM	Reconvene Hazard Mitigation Planning Team and begin plan update. Coordinate monthly meetings with Hazard Mitigation Steering Committee.
First Quarter 2021	Hazard Mitigation Steering Committee Participating Jurisdictions MN HSEM	Continue plan update.
Fourth Quarter 2021	Hazard Mitigation Steering Committee Participating Jurisdictions MN HSEM	Submit plan to FEMA for final approval

7.6 Incorporation into Existing Planning Mechanisms

As part of the local capability assessment conducted during the planning process, the Hazard Mitigation Steering Committee identified current plans, programs, policies/ordinances, and studies/reports that will augment or help support mitigation planning efforts. The Hazard Mitigation Steering Committee will meet on an annual basis, and will be the mechanism for ensuring the county integrates hazard mitigation into its future planning activities. Following

plan approval and adoption, the Hazard Mitigation Steering Committee and participating jurisdictions will work to incorporate, where applicable, the plan into the planning mechanisms identified in the mitigation action section. Throughout the plan maintenance cycle, the Becker County Emergency Manager will work with the county and participating jurisdictions to integrate hazard mitigation goals and actions into the general operations of Becker County agencies. The Becker County Emergency Manager will work with agencies to identify opportunities as outlined below:

- Update work plans, policies, or procedures to include hazard mitigation concepts
- Identify potential mitigation funding within capital and operational budgets
- Issue plans, policies, executive orders, regulations, or other directives to carry out mitigation actions
- Add hazard mitigation elements to redevelopment plans

7.7 Continued Public Involvement

Becker County is dedicated to continued public involvement in the hazard mitigation planning and review process. During all phases of plan maintenance, the public will have the opportunity to provide feedback. The 2016 Plan will be maintained and available for review on the county website. Individuals will have an opportunity to submit comments for the plan update at any time. The Becker County Emergency Manager will compile all comments and present them at the annual Hazard Mitigation Steering Committee meetings, where members will consider them for incorporation into the revision. To help publicize the revised plan six months prior to the submission of the 2021 plan update, Becker County will post a notice on its website requesting feedback on an updated draft plan. The Hazard Mitigation Planning Team will hold community involvement meetings with representatives from academic institutions, the private sector, community groups, and neighboring jurisdictions. This will provide the public an opportunity to express their concerns, opinions, or ideas about any updates/changes that are proposed to the plan.

7.8 The Hazard Mitigation Steering Committee

The Hazard Mitigation Steering Committee oversees changes and modifications to the county plan, and will regularly review each goal and objective to determine its relevance to the changing situation of the county. The Hazard Mitigation Steering Committee will also monitor and evaluate the mitigation strategies in this plan to ensure that the document reflects current hazard/risk analysis, development trends, code changes, and risk perceptions.
The Hazard Mitigation Steering Committee and the participating jurisdictions agree that outreach and input will be solicited throughout the plan's lifecycle through workshops, presentations, meetings, the internet, and other public information and education campaigns.
To ensure the plan is up to date and relevant the Hazard Mitigation Steering Committee meets annually, within a timely manner after any actual or exercised disaster, and/or at the direction of the Becker County Emergency Manager.

7.9 Participating Jurisdictions

Participating jurisdictions are key stakeholders within the Becker County Mitigation Plan, and as such, have agreed to be an active participant in the mitigation process. Participating jurisdictions may be active Hazard Mitigation Steering Committee members, but they are not required to be members. Participating jurisdictions are welcome to attend mitigation-planning meetings and or review the minutes of said meetings.

The participating jurisdictions have agreed to ensure the Becker County Hazard Mitigation is current and relevant. Participating jurisdictions agree to provide updates of appropriate activities occurring within their jurisdictions on a regular basis, and/or at the direction of the Becker County Emergency Manager.

Participating jurisdictions have agreed to ensure that within their own jurisdictions the Becker County Hazard Mitigation is integrated into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate. Jurisdictions also agree to work with the Becker County Emergency Manager to identify areas of plan integration, as well as provide annual progress reports of the integration of the Becker County Hazard Mitigation into existing and or new plans. Conversely, the Becker County Emergency Manager agrees to ensure participating jurisdictions are included in the planning process, particularly when plan updates will affect the participating jurisdictions, and when or if changes are made to the Becker County Hazard Mitigation. Furthermore, the participating jurisdictions agree to work with the Becker County Emergency Manager and Hazard Mitigation Steering Committee when requested.

Appendix A: Inventory of Hazard Mitigation Programs, Policies, and Funding

Federal Agencies and Programs
U.S. Department of Homeland Security

Federal Emergency Management Agency (FEMA)
General information on mitigation planning, hazards, disaster assistance programs, current disasters, etc.

Hazard Mitigation Grant Program (HMGP)
HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

Pre-Disaster Mitigation (PDM)
PDM provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time, also reducing reliance on Federal funding from actual disaster declarations.

Flood Mitigation Assistance (FMA)
FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP).

National Flood Insurance Plan
Detailed information on the National Flood Insurance Program and other mitigation activities

Hazard Mitigation Funding Under Section 406 (Public Assistance)
Section 406 provides discretionary authority to fund mitigation measures in conjunction with the repair of the disaster-damaged facilities.

U.S. Department of Agriculture (USDA)

Natural Resources Conservation Service (NRCS)
To provide leadership in a partnership effort to help conserve, improve, and sustain our natural resources and environment

Community Facility Grants
Assistance for the development of essential community facilities. Grant funds can be used to construct, enlarge, or improve community facilities for health care, public safety, and community and public services.

Emergency Watershed Protection (EWP)
Program is for emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a

sudden impairment of the watershed.

Environmental Quality Incentives Program (EQIP)
Provides technical assistance, cost-share payments, and incentive payments to assist crop, livestock, and other agricultural producers with environmental and conservation improvements to their operations.

Wetlands Reserve Program
A voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. Provides technical and financial support to help landowners.

Conservation Easements
In cooperation with Minnesota BWSR funding for conservation easements on frequently flooded lands is available. One of many Reinvest in Minnesota (RIM) - NRCS partnerships.

Farm Service Agency (FSA)
Disaster Assistance Programs available, include:
Conservation Loans
Conservation Reserve Program
Emergency Conservation Program
Non-Insured Crop Disaster Assistance Program
Emergency Farm Loans

U.S. Department of Commerce (DOC)

Economic Development Administration (EDA)
To generate jobs, help retain existing jobs, and stimulate industrial and commercial growth in economically distressed areas of the U.S.

U.S. Census Bureau
Profile of Minnesota and each Minnesota County

National Oceanic and Atmospheric Administration (NOAA)

NOAA, Coasts
Provides detailed information on coastal water issues, including the Great Lakes

NOAA, National Climatic Data Center
Current and historical archive of climatic data and information

NOAA, Drought Information Center
Updated drought conditions including monitors and outlooks

NOAA, National Severe Storms Laboratory
Comprehensive information on severe weather research

NOAA, National Weather Service (NWS)

Provides all available weather information including warning updates

Advanced Hydrologic Prediction Service (AHPS)
A program designed to provide improved river and flood forecasting and water information. AHPS provides a suite of graphical and numeric products over the Internet to assist community leaders and Emergency Managers in making a better life- and cost-saving decisions about evacuations and movement of the property before flooding occurs.

Flood Inundation Mapping
This interactive web page shows the spatial extent of possible or expected flooding in a given area. It can be used to show if roadways and structures will be impacted by floodwaters. At the limited number of forecast locations where inundation maps are currently available, this web page is accessed by clicking on the inundation mapping tab on the hydrograph webpage. In collaboration with partners, this product will be expanded to new locations.

Flash Flood Guidance
The North Central River Forecast Centers issues Flash Flood Guidance throughout the day for every county in their area. The river forecast centers determine 1, 3 and 6-hour flash flood guidance values for all counties and 12 and 24-hour values for parts of the eastern United States. Flash Flood Guidance estimates the average number of inches of rainfall for given durations required to produce flash flooding in the indicated county.

North Central River Forecast Center
Contains a variety of seasonal products including the Spring Hydrologic Outlook

U.S. Army Corps of Engineers (USACE)
Planning programs include Flood Risk Management, Planning Assistance to States, Flood Plain Management Services, and Silver Jackets.

Planning Assistance to States (PAS)
Funded annually by Congress. Federal allotments for each State or Tribe from the nation-wide appropriation are limited to $2,000,0000 annually, but typically are much less. Individual studies, of which there may be more than one per State or Tribe per year, generally cost $25,000 to $75,000. The studies may be phased over several years and cover a wide range of water resource planning activities. PAS studies are cost shared on a 50 percent Federal-50 percent non-Federal basis. The entire local sponsor contribution may be work in kind, and WRDA 2007, Section 2013 provided authority for 100 percent Federal funded PAS studies for hydrologic, economic, and environmental data and analyses.

Floodplain Management Services
A full range of technical services and planning guidance on flood and floodplain issues is provided upon request. These services are generally made available to other federal, state, and local agencies, but some may also be used by nongovernmental organizations and individuals and are 100 percent federally funded.

Regional Flood Risk Management Team
This Regional Flood Risk Management Team (RFRMT) will integrate pre-flood mitigation with a long-term strategy to plan and implement pre- and post-flood emergency actions, while developing promising

nonstructural alternatives and other flood risk mitigation actions recognized to reduce future flood risk within the region.

Cold Regions Research and Engineering Laboratory (CRREL)
Engineering and technology for use in cold regions

Flood Damage Reduction Studies & Projects
Flood damage reduction is one of the primary missions of the U.S. Army Corps of Engineers. As such, the Corps of Engineers may undertake studies and build projects to reduce and/or minimize flood damages. The Corps of Engineers may investigate flooding problems and opportunities in response to directives, called authorizations, from the Congress. Congressional authorizations are contained in public laws and in resolutions of either the House Public Works and Transportation Committee or the Senate Environment and Public Works Committee.

Continuing Authorities Program
Under the Continuing Authorities Program (CAP) legislation authorizes the Corps of Engineers to plan, design, and construct certain types of water resource and ecosystem restoration projects without additional and specific congressional authorization. The purpose is to implement projects of limited scope and complexity. Each authority has specific implementation guidelines, total program, and per-project funding limits.

Funding: Studies are cost shared 50/50 during feasibility. Most projects are cost shared 65 percent Federal and 35 percent local during implementation unless otherwise noted.

Small Flood Control Projects authorized by Section 205 of the 1948 Flood Control Act. Per-project: Federal funding limit of $7 million. Designed to implement projects that reduce overland flood damages. Projects must be engineering sound, economically justified, and environmentally acceptable.

Emergency Streambank Protection Projects authorized by Section 14 of the 1946 Flood Control Act. Per-project Federal funding limit of $1.5 million. Designed to protect essential public facilities threatened by flood-induced erosion.

Aquatic Ecosystem Restoration authorized by Section 206 of the 1996 Water Resources Development Act. Per-project Federal funding limit of $5 million. Designed to develop aquatic ecosystem restoration and protection projects that improve the quality of the environment, are in the public interest, and are cost effective.

Project Modifications for the Improvement of the Environment authorized by Section 1135 of the 1986 Water Resources Development Act. Federal funding limit of $5 million. Designed to modify existing Corps projects for the purpose of improving environmental quality.

Section 524 of the Water Resources Development Act of 2000: Minnesota Dams
Provides for inventory, inspection, modification and/or rehabilitation of dams originally constructed by the Civilian Conservation Corps, Works Progress Administration, and Works Projects Administration (WPA) in Minnesota. Oversight of 361 of the original 417 WPA dams falls to the Minnesota Department of Natural Resources (DNR) through the office of the State Dam Safety Engineer. The rest are owned and operated

by individual counties and the National Park Service.

Federal Energy Regulatory Commission (FERC)
Regulates dams that generate electric hydropower.

U.S. Geologic Survey (USGS)
Excellent source of natural disaster information (earthquakes, drought, floods, etc.).

Real-Time Data for Minnesota Streamflow
Users can select data from multiple sites using a broad set of filters, such as by state, county, watershed and a latitude/longitude box. This new web service can benefit users with programs that download tab-delimited real-time data from 138 gages. This data is also available in coordination with NWS-AHPS and the Corps of Engineers websites, although USGS quality assures and maintains the data.

Water Watch
The site displays maps, graphs, and tables describing real-time, recent, and past streamflow conditions for the United States. The real-time information generally is updated on an hourly basis. The stream gage-based maps show conditions for real-time, average daily, and 7-day average stream flow. The real-time streamflow maps highlight flood and high flow conditions. Water Watch also includes tables of current streamflow information and locations of flooding.

Flood Watch
In coordination with USGS's Water Watch, Web site the state map shows the location of stream gages where the water level is above flood or at high flow. High flow conditions are expressed as percentiles that compare the current (i.e., within the past several hours) instantaneous flow value to historical daily mean flow values for all days of the year.

Water Alert
The U.S. Geological Survey WaterAlert service sends e-mail or text messages when certain parameters measured by a USGS data-collection station exceed user-definable thresholds.

StreamStats
A Web-based Geographic Information System (GIS) that provides users with access to an assortment of analytical tools that are useful for water-resources planning and management, and for engineering design applications.

USGS Programs in Minnesota
Details USGS activities in Minnesota.

Earthquake Hazards Program
Up- to-date information on world seismicity.

U.S. Department of Housing and Urban Development (HUD)

Community Development Block Grants
Disaster grants are used to rebuild resilient communities after a disaster.

Disaster Recovery Assistance
Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes.

Neighborhood Stabilization Program
Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis.

U.S. Department of Transportation (DOT)

Federal Highway Administration (FHWA)
Provides funding for mitigation activities such as snow fences and living snow fences as part of construction funding

U.S. Small Business Administration (SBA)
Provides training and advocacy for small firms.

Another valuable resource is the *Catalog of Federal Domestic Assistance (CFDA)*. It provides a full listing of all federal programs available to state and local governments; federally recognized Indian tribal governments; domestic public, quasi- public, and private profit and nonprofit organizations and institutions; specialized groups; and individuals.

State Agencies and Programs

This section is an inventory of state programs that are important to mitigation efforts statewide. Additional information for agencies with programs that may assist in mitigation efforts are listed with applicable programs and funding the program may offer. The following also lists programs utilized by the state of Minnesota to assist with implementation of mitigation actions. A brief description of each program follows, as does funding information.

Minnesota Department of Administration (ADMIN)
Provides services to government agencies: information technology, facilities and property management, graphic and geographic information systems data and software.

Minnesota Department of Agriculture (MDA)
Responsible for the regulation of pesticides, fertilizers, food safety and feed including emergency response, state Superfund authority and financial assistance for agricultural entities.

Minnesota Board of Water and Soil Resources (BWSR)
Assist local governments to manage and conserve water and soil resources.

Program: *Reinvest In Minnesota (RIM)*
Funding: Minnesota's premier conservation easement program on privately owned lands.

Program: *Reinvest In Minnesota -Wetlands Reserve Program, RIM-WRP*

Funding: Administered by the USDA Natural Resources Conservation Service (NRCS). The RIM-WRP partnership is implemented by local Soil and Water Conservation Districts. Conservation easements on frequently flooded lands.

Minnesota Department of Commerce (COMM)
The Market Assurance Division in the Department of Commerce regulates insurance companies & agents, banks, and real estate.

The Office of Energy Security within the Department of Commerce manages energy assistance funds and provides information and assistance to consumers and businesses on home improvements, financial assistance, renewable technologies, and utility regulations.

Program: *Consumer Response Team (CRT)*
The Minnesota Department of Commerce Consumer Response Team (CRT) is comprised of investigators who respond to consumer phone calls specifically about insurance. The CRT attempts to resolve disputes between consumers and the insurance industry informally. In the Twin Cities, metro area calls (651) 296-2488 or statewide toll-free at 800-657-3602.

Program: *Weatherization Assistance Program (WAP)*
Assists income eligible households with emergency repair and replacement services. The Weatherization Assistance Program (WAP) uses energy conservation techniques to reduce the cost of home energy. Correcting health and safety hazards and potentially life-threatening conditions is the first consideration in WAP activities. Households where one or more members have received TANF (Temporary Assistance for Needy Families) or SSI (Supplemental Security Income) within the last 12 months.

Households at or below 200% of Federal Poverty Income Guidelines are income eligible for WAP.
Homeowners and renters may be income eligible for WAP.

Priority is given to households with at least one elderly or disabled member and to customers with the highest heating costs.

Funding: Federally funded through the U.S. Department of Energy and the Department of Health and Human Services.

Program: *Energy Assistance Program (EAP)*
The Energy Assistance Program (EAP) helps pay home heating costs. Households with the lowest incomes and highest energy costs receive the greatest benefit.

Households who are at or below 50 percent of the state median income are eligible
Size of grant is based on household size, income, fuel type, and energy usage
Households with the lowest income and highest fuel costs receive the highest grants
Funds are available for renters or homeowners

Funding: Federally funded through the U.S. Federally funded through U.S. Department of Human Services

Program: *Office of Energy Security (OES)*

The OES works to communicate the preparedness actions of utilities that serve areas affected by disasters. The OES and Public Utilities Commission (PUC) coordinate responses from utilities with regard to restoration activities and typically work through single points of contact at utilities and utility associations.
The OES makes information available through its Energy Information Center on energy conservation measures that homeowners may pursue in the event of an emergency that affects the supply or distribution of energy to an area of the state.

Minnesota Emergency Medical Services Regulatory Board (EMSRB)
Provides leadership for emergency medical care for the people of Minnesota.

Minnesota Department of Employment and Economic Development (DEED)
To advance the economic vitality of Minnesota through trade and economic development, including the provision of employer and labor market information.

Program: *Public Facilities Authority (PFA)* The authority administers and oversees the financial management of three revolving loan funds and other programs that help local units of government construct facilities for clean water (including wastewater, storm water, and drinking water) and other kinds of essential public infrastructure projects
Funding: Provides municipal financing programs and expertise to help communities build public infrastructure that preserves the environment, protects public health, and promotes economic growth.

Program: *Small Cities Development Program*
The purpose is to provide decent housing, a suitable living environment and expanding economic opportunities, principally for persons of low-and-moderate income to cities and townships with populations under 50,000 and counties with populations under 200,000.
Funding Provides federal grants from the U.S. Department of Housing and Urban Development (HUD) to local units of government. State program rules subdivide grant funds into three general categories: Housing Grants, Project Facility Grants, and Comprehensive Grants. Public Facility Grants could include projects involving storm sewer projects and flood control projects.

Program: *Greater Minnesota Business Development Public Infrastructure Grant Program*
The purpose is to stimulate new economic development, create or retain jobs in Greater Minnesota, through public infrastructure investments.
Funding: Provides grants to cities of up to 50% of the capital costs of the public infrastructure necessary, which expand or retain jobs in the area, increase the tax base, or which expand or create new economic development. Eligible projects include, but not limited to wastewater collection and treatment, drinking water, storm sewers, utility extensions, and streets.

Program: *Minnesota Redevelopment Grant Program*
The purpose is to provide grants to assist development authorities with costs related to redeveloping blighted industrial, residential or commercial properties.
Funding: Grants pay up to 50% of eligible redevelopment costs for a qualifying site, with a 50% local match. Grants can pay for land acquisition, demolition, infrastructure improvements, stabilizing unstable soils, ponding, environmental infrastructure, building construction, design and engineering and adaptive reuse of buildings.

Minnesota Management & Budget (MMB)
Expedite fiscal management during a state disaster. Assist with funding issues when federal assistance is not provided.

Minnesota Department of Health (MDH)
Detailed information on services and current events affecting the citizens of Minnesota.

Minnesota's State Historic Preservation Office (SHPO)
Review and Compliance: The SHPO consults with federal and state government agencies to identify historic properties in government project areas and advise on ways to avoid or reduce adverse effects on those properties.

Minnesota Housing Finance Agency (MHFA)
Provides low- and moderate-income housing and resources.

Minnesota Department of Human Services (DHS)
Provides health care, economic assistance, and other services for those in need.

Minnesota Department of Labor & Industry (DLI)
Assist with investigations when workers are injured, and detect air contaminants caused by chemical or geological agents, and assessing hazards. Statewide building codes and construction planning and inspection.

Metropolitan Council
Provides information on economic development and planning for anticipated growth in the seven-county metro areas –Anoka, Carver, Dakota, Ramsey, Scott, and Washington Counties.

Program: *Livable Communities Grant Program*
The Council awards grants to participating communities in the seven-county area to help them, among other things, create development or redevelopment that demonstrates the efficient and cost-effective use of land and infrastructure, a range of housing types and costs, commercial and community uses, walkable neighborhoods and easy access to transit and open space.
Funding: Four different accounts to enable communities through the region to carry out their development plans, and leverage millions of dollars in private and public investment while providing jobs and business growth.

Minnesota Department of Military Affairs - National Guard (DMA)
Information on the capabilities of the Minnesota National Guard.

Minnesota Department of Natural Resources (MN DNR)
The Financial Assistance Directory provides summary level information on all of the Department of Natural Resources' financial assistance programs. The department offers a wide variety of financial assistance programs to cities, counties, townships, non-profits, schools, private individuals and others. See MN DNR website. Categories include:

- Aquatic Invasive Species

- Enforcement (snowmobile & OHV safety)
- Fire Protection Programs
- Forest management
- Gifts and donations
- Habitat improvement
- Land conservation
- Recreation (general, trails, and water)
- Road Improvements
- Water

MN DNR Division of Ecological and Water Resources
The conservation of natural systems and the maintenance of biodiversity. Water education information is available on and discusses floodplain management, flood mitigation, drought/water supply, dam safety, flood warning, climatology, and lake and stream gaging.

Program: *Flood Hazard Mitigation Grant Assistance: Flood Damage Reduction (FDR) Program*
To provide technical and financial assistance to local governmental units for conducting flood damage reduction studies and for planning and implementing flood damage reduction measures.
Funding: A maximum of 50% of total eligible project costs up to $150,000 with grants more than $150,000 requiring approval by the Legislature.

Program: *Dam Safety Grants*
To improve the safety and condition of publicly owned dams and water level control structures.
Funding: Reimbursement of costs, up to 50% for repairs, up to 100% for removals. Grants ranged from $25,000 to $1,000,000

Program: *Wetland Tax Exemption Program*
To provide a financial incentive to maintain wetlands in their natural state and to promote an awareness of wetland values.
Funding: Qualifying areas are exempt from property taxes that remain in effect as long as wetland meets the requirements set forth in the statutes.

Program: *FireWise in Minnesota*
The Minnesota FireWise Project is working with local communities by passing federal Fire Plan funds through to local communities as grants for various "on-the-ground" activities including homeowner, mitigation education, home site assessment, access improvement, and dry hydrants. It involves community groups including fire and emergency services, local schools, city staff (i.e. foresters, planners), and local interest groups.
Funding: Grant request for 50:50 cost-share funding for assessment & planning, education & mitigation activities. Initial grant request may be for a small amount ($15,000) until FireWise Action Plan is developed. Second grants are available to implement additional actions.

Program: *Forest Stewardship Program*

To provide technical advice and long-range forest management planning to interested landowners. All aspects of the program are voluntary. Plans are designed to meet landowner goals while maintaining the sustainability of the land. The entire property except active farming.
Funding: For the state's cost share program to help defer the costs of implementation of forest management activities. Must enroll forested lands into the Sustainable Forestry Incentive Act or 2c Managed Forest Land to be eligible for property tax relief programs

Program: *Minnesota State Climatology Office*
The State Climatology Office workgroups exist to study and describe the climate of Minnesota. Each of its members concentrates its efforts on specific topical areas in which climate plays a significant role.

Minnesota Pollution Control Agency (PCA)
Provides pollution control information for Minnesota.

Program: *Stormwater Program*
Minnesota Pollution Control Agency (MPCA) is the delegated permitting authority for Minnesota of the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES). Permits are required for most construction activities designed to limit polluted discharges and implement the best management practices.

Funding: The Clean Water Revolving Fund, also known as the Clean Water State Revolving Fund or simply SRF, is established under the Federal Clean Water Act and state law to make loans to for both point source (wastewater and stormwater) and nonpoint source water pollution control projects. The PFA prepares an annual Intended Use Plan (IUP) based on a Project Priority List developed by the MPCA. The IUP describes the projects and activities eligible for funding during the state fiscal year.

Program: *Interagency Climate Adaptation Team*
A collaboration of state agencies with the purpose of addressing climate change issues in the state.
Other MPCA work related to mitigation:
Preparing for homes and businesses for floods
Preparing wastewater treatment plants for floods
Preparing feedlots for floods
Minnesota Department of Public Safety (DPS)
State Fire Marshal, Office of Communications, Office of Pipeline Safety Team, State Patrol, Office of Justice Programs, Bureau of Criminal Apprehension, Alcohol and Gambling, Enforcement and Office of Traffic Safety.

MN DPS Homeland Security and Emergency Management (HSEM)
This site contains information on Emergency Management.

Program: *Minnesota Recovers Task Force: Minnesota's Official Disaster Information Center*
Minnesota Recovers is the state's clearinghouse for all information about floods, tornadoes and other natural disasters that strike Minnesota communities. Information about federal, state and local government disaster assistance efforts is available on this website.

Funding: Application for community financial assistance is available. Depending upon disaster, different types of funding become available. Flood-Control Grants, Small Cities Development Program, and Public Facilities Authority funding information is available here.

Minnesota Office of the State Archaeologist
Conduct research into the prehistoric and historic archeology of Minnesota.

Minnesota State Colleges and Universities (MNSCU)
Provide information about Higher education in Minnesota.

Minnesota Department of Transportation (DOT)
Comprehensive transportation issues in Minnesota.

University of Minnesota
University of Minnesota's mission of education, research, and public engagement; our academic scope; and our statewide presence are marks of distinction and position us well to address the critical problems of this new century.

Other Organizations
The following is a list of associations and organizations that may fund, educate or in some way assist mitigation in the state. The list is a resource for local mitigation planners and has been utilized by the state in the update of this plan.

American Red Cross
Provide relief to victims of disasters and help people prevent, prepare for, and respond to emergencies.

American Water Works Association
Information on safe water resources.

League of Minnesota Cities
A membership organization dedicated to promoting excellence in local government. The League serves its more than 800 member cities through advocacy, education and training, policy development, risk management, and other services.

Association of Minnesota Counties
A broad range of services to its members, including education, communications, and intergovernmental relations. AMC works closely with the legislative and administrative branches of government in seeing that legislation and policies favorable to counties are enacted.

Association of State Dam Safety Officials
General Information about dams and dam safety in the US.

Mid-America Earthquake Center (MAE)
One of three national earthquake engineering research centers established by the National Science Foundation.

Minnesota Geological Survey (MGS)
The University outreach center for the science and technology of earth resources in Minnesota.

Minnesota Association of Watershed Districts (MAWD)
Provides educational opportunities, information and training for watershed district managers and staff through yearly tours, meetings and quarterly newsletters.

Minnesota Association of Soil and Water Conservation Districts (MASWCD)
Provide voluntary, incentive-driven approaches to landowners for better soil and cleaner water. Provide private landowners with technical assistance to implement a wide variety of conservation practices.

Minnesota Independent Insurance Agents
See calendar for NFIP training.

National Association of Counties (NACO)
NACO is the only nation-wide organization representing county governments.

Minnesota Natural Resource Conservation Service
Locally based NRCS staff work directly with farmers, ranchers, and others, to provide technical and financial conservation assistance.

National Drought Mitigation Center
Information on drought preparation and risk management.

National Emergency Management Association (NEMA)
NEMA is the professional association of state, pacific, and Caribbean insular state emergency management directors.

Natural Hazard Mitigation Association
NHMA is an association for those in the hazard mitigation profession by offering a workshop and bringing expertise and experience to organizations, communities or regions with mitigation planning, training, outreach and implementation.

Association of Minnesota Emergency Managers (AMEM)
AMEM is the professional association of Emergency Managers in Minnesota.

National Energy Foundation
This is the site for kids, parents, and teachers, with a focus on water conservation in the home.

National Fire Protection Association (NFPA)
Provides scientifically based fire codes and standards, research, training, and education.

National Lightning Safety Institute
Independent, non-profit consulting, education and research organization focusing on lightning safety.

Natural Hazards Center at the University of Colorado

Clearinghouse for natural hazards information. Publishes the Natural Hazards Observer.

WeatherREADY
The goal of Weather Ready is to raise national awareness of the need to prepare for severe weather. Sponsored by the Weather Channel

Societal Aspects of Weather-Injury and Damage Statistics
Contains societal impact data for weather-related disasters.

The Disaster Center
Provides news and information on current disasters, and the emergency management field.

The Disaster Research Center (University of Delaware)
Research center for the preparation and mitigation of natural and technological disaster for groups, organizations and communities.

The Tornado Project
Offers tornado books, posters, and videos.

United Nations International Strategy for Disaster Reduction
Increase public awareness of hazard and risk issues for the reduction of disasters in modern societies, motivate public administration policies and measures to reduce risks, and improve access to science and technology for risk reduction in local communities.

University of Wisconsin Disaster Management Center
The center's goal is to help improve the emergency management performance of non-governmental organizations, local and national governments, and international organizations, through a comprehensive professional development program in disaster management.

Appendix B: Hazard Event Data for Becker County, MN Hazard Mitigation Plan

Drought Data from National Climatic Data Center for 1/1/1964 to 4/30/2015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	07/18/2006	07:00	CST	Drought		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	07/25/2006	07:00	CST	Drought		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	08/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	08/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	09/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	09/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	10/01/2006	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/01/2006	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/01/2006	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/28/2015	06:00	CST-6	Drought		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/28/2015	06:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Infectious Disease Data

Table 57: Structural Fire Data for Becker County from 2007 to 2013

Year	Fire Runs	Other Runs	Total Loss	Fire Rate	Average Loss per Fire	Fire Deaths
2013	208	375	$4,910,135	200	$30,881	1
2012	245	381	$872,250	169	$4,640	0
2011	172	416	$492,808	229	$3,545	1
2010	200	346	$812,520	209	$5,346	0
2009	186	389	$989,200	236	$7,327	3
2008	164	295	$571,900	272	$4,888	0
2007	206	296	$440,000	201	$2,785	1

2013 Data by Fire Department for Kittson County

Fire Department	County	Fires	Non-Fires	Dollar Loss
Audubon	Becker	3	2	$435,000
Callaway	Becker	7	10	$0
Carsonville	Becker	33	156	$79,400
Detroit Lakes	Becker	47	155	$481,000
Elbow-Tulaby Lks.	Becker	8	2	$0
Frazee	Becker	27	27	$6,500
Lake Park	Becker	15	11	$0
Ogema	Becker	9	4	$0
White Earth	Becker	1	0	$0
Wolf Lake	Becker	58	19	$3,908,235

Flood Data from National Climatic Data Center for 1/1/1964 to 4/30/3015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	553.00K	4.230M
DETROIT LAKES	BECKER CO.	MN	06/29/1997	17:00	CST	Flood		0	0	50.00K	0.00K
PONSFORD	BECKER CO.	MN	06/19/1998	13:17	CST	Flash Flood		0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/26/1998	20:30	CST	Flash Flood		0	0	1.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/07/1998	03:00	CST	Flood		0	0	25.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	06/19/2000	18:30	CST	Flood		0	0	0.00K	4.000M
WOLF LAKE	BECKER CO.	MN	04/07/2001	08:10	CST	Flash Flood		0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/2002	07:00	CST	Flash Flood		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	06/09/2002	10:00	CST	Flood		0	0	100.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	06/09/2002	10:00	CST	Flood		0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/22/2002	23:00	CST	Flash Flood		0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	06/22/2002	23:00	CST	Flash Flood		0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/11/2004	19:02	CST	Flash Flood		0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	06/23/2005	20:30	CST	Flash Flood		0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/26/2005	14:00	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	BECKER CO.	MN	03/29/2006	00:00	CST	Flood		0	0	0.00K	0.00K
COUNTYWIDE	BECKER CO.	MN	04/01/2006	00:00	CST	Flood		0	0	146.00K	0.00K
OGEMA	BECKER CO.	MN	03/22/2009	11:15	CST-6	Flood		0	0	5.00K	0.00K
OGEMA	BECKER CO.	MN	04/01/2009	00:00	CST-6	Flood		0	0	5.00K	0.00K
WHITE EARTH	BECKER CO.	MN	05/24/2010	09:15	CST-6	Flash Flood		0	0	10.00K	10.00K
DETROIT LAKES	BECKER CO.	MN	07/04/2010	00:45	CST-6	Flash Flood		0	0	200.00K	100.00K
OGEMA	BECKER CO.	MN	04/03/2011	14:03	CST-6	Flood		0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	05/01/2011	00:00	CST-6	Flood		0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/19/2011	05:45	CST-6	Flash Flood		0	0	4.00K	10.00K
EVERGREEN	BECKER CO.	MN	07/19/2011	06:45	CST-6	Flash Flood		0	0	2.00K	10.00K

LAKE PARK	BECKER CO.	MN	05/27/2012	06:19	CST-6	Flood		0	0	5.00K	100.00K
Totals:								0	0	553.00K	4.230M

Hail Data from National Climatic Data Center for 1/1/1964 to 4/30/2015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	50.00K	230.00K
BECKER CO.	BECKER CO.	MN	07/04/1966	18:54	CST	Hail	4.50 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/24/1966	21:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/19/1971	17:30	CST	Hail	2.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/19/1971	17:30	CST	Hail	3.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/21/1971	07:45	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/21/1971	07:45	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	09/02/1973	11:50	CST	Hail	2.50 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/31/1975	19:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	04/15/1976	17:35	CST	Hail	1.50 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/29/1977	18:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/27/1977	16:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/05/1980	15:00	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/10/1981	17:00	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/03/1982	18:12	CST	Hail	2.50 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/02/1983	20:35	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/07/1983	20:35	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	04/21/1985	16:20	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/10/1985	09:00	CST	Hail	2.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/10/1985	09:20	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/10/1985	09:45	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/10/1985	21:40	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/21/1985	15:15	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/21/1988	10:58	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/07/1990	16:00	CST	Hail	1.75 in.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/09/1991	15:48	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/05/1996	16:56	CST	Hail	1.00 in.	0	0	0.00K	0.00K
TAMERAC REFUGE	BECKER CO.	MN	06/05/1996	17:32	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/05/1996	17:52	CST	Hail	1.50 in.	0	0	10.00K	10.00K
WOLF LAKE	BECKER CO.	MN	06/05/1996	18:16	CST	Hail	1.50 in.	0	0	10.00K	10.00K
WOLF LAKE	BECKER CO.	MN	06/05/1996	18:30	CST	Hail	1.75 in.	0	0	10.00K	10.00K
WOLF LAKE	BECKER CO.	MN	06/05/1996	18:37	CST	Hail	1.25 in.	0	0	0.00K	0.00K

MENAHGA	BECKER CO.	MN	06/05/1996	18:40	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/21/1996	14:45	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/21/1996	17:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/28/1997	02:16	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/28/1997	08:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	09/01/1997	02:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/01/1998	15:57	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/27/1998	19:57	CST	Hail	0.75 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/20/1998	15:45	CST	Hail	1.00 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	07/20/1998	16:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/16/1998	17:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/16/1998	17:45	CST	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	08/16/1998	18:15	CST	Hail	0.88 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/16/1998	18:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
WOLF LAKE	BECKER CO.	MN	08/16/1998	18:50	CST	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	08/16/1998	18:50	CST	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/16/1998	19:00	CST	Hail	2.50 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/16/1998	19:25	CST	Hail	1.00 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/1999	14:09	CST	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/03/1999	08:27	CST	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/04/1999	07:15	CST	Hail	2.00 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/04/1999	08:13	CST	Hail	0.88 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	07/25/1999	12:35	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/25/1999	13:42	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/27/1999	16:24	CST	Hail	0.88 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/27/1999	16:28	CST	Hail	1.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/09/1999	01:40	CST	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	07/01/2000	23:18	CST	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	07/01/2000	23:20	CST	Hail	1.75 in.	0	0	0.00K	0.00K
SHOREHAM	BECKER CO.	MN	07/25/2000	13:40	CST	Hail	0.75 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	07/25/2000	17:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/14/2000	08:35	CST	Hail	1.25 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	08/14/2000	09:00	CST	Hail	0.88 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/14/2000	09:45	CST	Hail	0.88 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/14/2000	10:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
WOLF LAKE	BECKER CO.	MN	08/14/2000	10:30	CST	Hail	1.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	09/02/2000	16:12	CST	Hail	1.50 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	09/02/2000	16:50	CST	Hail	0.75 in.	0	0	0.00K	0.00K

WOLF LAKE	BECKER CO.	MN	05/15/2001	15:15	CST	Hail	0.75 in.	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	05/15/2001	15:45	CST	Hail	2.00 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2001	17:20	CST	Hail	1.00 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2001	17:20	CST	Hail	0.88 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/20/2001	17:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/19/2001	01:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
SHOREHAM	BECKER CO.	MN	07/30/2001	10:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/30/2001	10:56	CST	Hail	0.88 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	08/17/2001	16:15	CST	Hail	1.00 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	08/17/2001	16:35	CST	Hail	0.75 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	05/29/2002	14:45	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/2002	01:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/2002	06:00	CST	Hail	1.50 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/2002	06:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	06/09/2002	07:55	CST	Hail	0.88 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/23/2002	23:25	CST	Hail	1.25 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/25/2002	01:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K
AUDUBON	BECKER CO.	MN	07/25/2002	01:45	CST	Hail	0.88 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	07/25/2002	18:55	CST	Hail	0.75 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	08/11/2002	20:30	CST	Hail	0.75 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/26/2002	16:00	CST	Hail	0.88 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	08/26/2002	18:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	08/28/2002	13:00	CST	Hail	0.88 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	08/28/2002	16:30	CST	Hail	1.75 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/28/2002	18:25	CST	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	09/18/2002	19:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	07/02/2003	15:00	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/02/2003	16:05	CST	Hail	0.88 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	07/02/2003	16:44	CST	Hail	1.75 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/29/2003	17:05	CST	Hail	0.75 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/29/2003	17:15	CST	Hail	0.75 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	07/29/2003	17:37	CST	Hail	0.75 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	09/17/2003	12:05	CST	Hail	0.88 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	09/17/2003	12:40	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/11/2004	19:14	CST	Hail	0.75 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	05/11/2004	19:21	CST	Hail	0.75 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	05/11/2004	19:40	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/11/2004	20:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K

DETROIT LAKES	BECKER CO.	MN	05/11/2004	20:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/11/2004	20:45	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/23/2004	11:50	CST	Hail	0.88 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/12/2004	22:15	CST	Hail	2.50 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/12/2004	22:45	CST	Hail	2.50 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/15/2004	16:15	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	08/08/2004	15:12	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	08/08/2004	15:35	CST	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	08/29/2004	18:23	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/08/2005	21:50	CST	Hail	1.00 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	06/23/2005	19:32	CST	Hail	0.75 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	06/26/2005	14:35	CST	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/27/2005	01:23	CST	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/29/2005	16:00	CST	Hail	0.88 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	10/16/2005	22:15	CST	Hail	0.88 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/26/2006	18:19	CST	Hail	1.00 in.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/13/2006	16:05	CST	Hail	0.75 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	07/13/2006	16:54	CST	Hail	0.75 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/13/2006	17:35	CST	Hail	0.75 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	06/07/2007	13:18	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
SNELLMAN	BECKER CO.	MN	06/07/2007	14:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/27/2007	14:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/27/2007	14:24	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	08/27/2007	14:55	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	08/27/2007	15:10	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	08/27/2007	18:30	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	09/21/2007	01:05	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	09/21/2007	02:45	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	05/31/2008	15:10	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
PINE PT AGENCY	BECKER CO.	MN	05/31/2008	15:59	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TAMARAC REFUGE	BECKER CO.	MN	05/31/2008	16:20	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	06/12/2008	17:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	06/27/2008	14:05	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/01/2008	21:43	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/11/2008	14:49	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	07/11/2008	14:52	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	07/11/2008	14:53	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	07/11/2008	15:20	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K

WOLF LAKE	BECKER CO.	MN	07/11/2008	15:25	CST-6	Hail	1.50 in.	0	0	20.00K	200.00K
OSAGE	BECKER CO.	MN	08/27/2008	01:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	05/24/2010	06:43	CST-6	Hail	2.50 in.	0	0	0.00K	0.00K
AUDUBON	BECKER CO.	MN	05/24/2010	06:44	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	07/17/2010	10:31	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/12/2011	18:00	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/19/2011	00:20	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	06/17/2012	18:40	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
AUDUBON	BECKER CO.	MN	06/19/2012	14:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/19/2012	14:19	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/19/2012	14:24	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	06/19/2012	14:25	CST-6	Hail	2.50 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	06/19/2012	14:25	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	06/19/2012	14:30	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	06/19/2012	14:36	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	06/19/2012	15:10	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
EVERGREEN	BECKER CO.	MN	07/02/2012	18:08	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DETROIT LAKES ARPT	BECKER CO.	MN	07/22/2012	19:04	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	07/22/2012	19:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WOLF LAKE	BECKER CO.	MN	07/22/2012	19:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/24/2012	22:40	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TAMARAC REFUGE	BECKER CO.	MN	05/18/2013	18:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
PINE PT AGENCY	BECKER CO.	MN	05/18/2013	18:33	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/20/2013	19:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	06/20/2013	21:10	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2013	21:13	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/20/2013	21:55	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/25/2013	23:08	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	08/25/2013	03:55	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	08/26/2013	17:26	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/31/2013	15:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TAMARAC REFUGE	BECKER CO.	MN	08/31/2013	18:53	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	07/05/2014	22:33	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	07/06/2014	00:05	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/06/2014	00:25	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CALLAWAY	BECKER CO.	MN	09/01/2014	16:40	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
Totals:								0	0	50.00K	230.00K

Summer Storm Data from National Climatic Data Center for 1/1/1964 to 4/30/2015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	878.20K	200.00K
BECKER CO.	BECKER CO.	MN	07/24/1966	21:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/20/1974	08:35	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/13/1974	13:20	CST	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/19/1975	06:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/28/1975	19:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/31/1975	19:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/07/1976	19:35	CST	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/10/1981	20:58	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/09/1985	02:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/17/1987	18:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/12/1988	15:40	CST	Thunderstorm Wind	53 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/05/1988	15:30	CST	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/23/1988	19:15	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/31/1988	02:33	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BECKER CO.	BECKER CO.	MN	06/28/1991	16:40	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake Park	BECKER CO.	MN	06/19/1994	19:10	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Detroit Lakes	BECKER CO.	MN	06/19/1994	19:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
S W of Detroit	BECKER CO.	MN	08/13/1994	01:17	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/17/1996	18:58	CST	Thunderstorm Wind		0	0	10.00K	0.00K
LAKE PARK	BECKER CO.	MN	05/17/1996	19:10	CST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/17/1996	19:35	CST	Thunderstorm Wind		0	0	50.00K	0.00K
OGEMA	BECKER CO.	MN	05/17/1996	19:40	CST	Thunderstorm Wind		0	0	25.00K	0.00K
AUDUBON	BECKER CO.	MN	10/08/1997	20:50	CST	Thunderstorm Wind		0	0	2.00K	0.00K
ROCHERT	BECKER CO.	MN	10/08/1997	20:50	CST	Thunderstorm Wind		0	0	2.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	10/08/1997	20:50	CST	Thunderstorm Wind		0	0	2.00K	0.00K
LAKE PARK	BECKER CO.	MN	10/08/1997	21:00	CST	Thunderstorm Wind		0	0	5.00K	0.00K
FRAZEE	BECKER CO.	MN	06/26/1998	20:35	CST	Thunderstorm Wind		0	0	50.00K	0.00K
FRAZEE	BECKER CO.	MN	06/26/1998	20:35	CST	Thunderstorm Wind		0	0	0.40K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/26/1998	20:45	CST	Thunderstorm Wind		0	0	0.40K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/27/1998	19:57	CST	Thunderstorm Wind		0	0	0.20K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/27/1998	20:10	CST	Thunderstorm Wind		0	0	0.20K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/04/1999	07:30	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/04/1999	08:13	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/15/1999	15:40	CST	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K

DETROIT LAKES	BECKER CO.	MN	07/15/1999	15:40	CST	Thunderstorm Wind		0	0	20.00K	0.00K
FRAZEE	BECKER CO.	MN	07/15/1999	15:40	CST	Thunderstorm Wind		0	0	15.00K	0.00K
FRAZEE	BECKER CO.	MN	07/15/1999	15:40	CST	Thunderstorm Wind		0	0	0.50K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/15/1999	15:47	CST	Thunderstorm Wind		0	0	0.50K	0.00K
OSAGE	BECKER CO.	MN	07/15/1999	16:11	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/25/1999	13:30	CST	Thunderstorm Wind		0	0	1.00K	0.00K
WESTBURY	BECKER CO.	MN	08/22/1999	20:12	CST	Thunderstorm Wind	61 kts.	0	0	10.00K	0.00K
CORMORANT	BECKER CO.	MN	08/30/2000	21:45	CST	Thunderstorm Wind		0	0	0.50K	0.00K
FRAZEE	BECKER CO.	MN	06/08/2001	18:55	CST	Thunderstorm Wind		0	0	0.50K	0.00K
FRAZEE	BECKER CO.	MN	06/11/2001	11:20	CST	Thunderstorm Wind		0	0	40.00K	0.00K
WOLF LAKE	BECKER CO.	MN	06/11/2001	11:55	CST	Thunderstorm Wind		0	0	10.00K	0.00K
WOLF LAKE	BECKER CO.	MN	06/11/2001	12:00	CST	Thunderstorm Wind		0	0	15.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/21/2001	04:45	CST	Thunderstorm Wind	52 kts. E	0	0	20.00K	0.00K
CORMORANT	BECKER CO.	MN	07/21/2001	04:47	CST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/21/2001	04:50	CST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/30/2001	10:56	CST	Thunderstorm Wind		0	0	50.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/30/2001	10:56	CST	Thunderstorm Wind		0	0	20.00K	0.00K
OGEMA	BECKER CO.	MN	08/08/2001	01:45	CST	Thunderstorm Wind		0	0	1.00K	0.00K
TWO INLETS	BECKER CO.	MN	08/08/2001	02:00	CST	Thunderstorm Wind		0	0	1.00K	0.00K
PONSFORD	BECKER CO.	MN	08/08/2001	13:45	CST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/08/2001	21:15	CST	Thunderstorm Wind		0	0	5.00K	0.00K
OGEMA	BECKER CO.	MN	06/09/2002	04:00	CST	Thunderstorm Wind		0	0	0.20K	0.00K
CORMORANT	BECKER CO.	MN	06/19/2002	16:30	CST	Thunderstorm Wind		0	0	0.10K	0.00K
ROCHERT	BECKER CO.	MN	06/23/2002	23:45	CST	Thunderstorm Wind		0	0	0.20K	0.00K
OGEMA	BECKER CO.	MN	08/11/2002	19:10	CST	Thunderstorm Wind		0	0	0.20K	0.00K
LAKE PARK	BECKER CO.	MN	08/16/2002	21:57	CST	Thunderstorm Wind	55 kts. M	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	08/26/2002	20:30	CST	Thunderstorm Wind		0	0	10.00K	0.00K
SNELLMAN	BECKER CO.	MN	08/28/2002	18:58	CST	Thunderstorm Wind		0	0	0.30K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/23/2004	12:35	CST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/12/2004	22:30	CST	Thunderstorm Wind	70 kts. EG	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	09/05/2004	15:25	CST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	05/21/2005	15:40	CST	Thunderstorm Wind	65 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/29/2005	16:10	CST	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	06/29/2005	17:20	CST	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	09/05/2005	19:40	CST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/05/2006	14:28	CST	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	06/11/2007	00:45	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/11/2007	01:10	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K

LAKE PARK	BECKER CO.	MN	06/17/2007	23:09	CST-6	Thunderstorm Wind	55 kts. MG	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/17/2007	23:18	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
SHOREHAM	BECKER CO.	MN	06/17/2007	23:20	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	06/17/2007	23:22	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/14/2008	17:05	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	06/14/2008	20:18	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/01/2008	21:18	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/29/2008	01:13	CST-6	Thunderstorm Wind	52 kts. EG	0	0	5.00K	50.00K
TWO INLETS	BECKER CO.	MN	07/29/2008	01:48	CST-6	Thunderstorm Wind	55 kts. EG	0	0	5.00K	50.00K
OSAGE	BECKER CO.	MN	07/29/2008	01:50	CST-6	Thunderstorm Wind	70 kts. EG	0	0	500.00K	100.00K
LAKE PARK	BECKER CO.	MN	07/14/2010	05:27	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
WHITE EARTH	BECKER CO.	MN	07/27/2010	04:30	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
WESTBURY	BECKER CO.	MN	07/19/2011	04:50	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	07/19/2011	05:44	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/23/2011	03:14	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/23/2011	03:20	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	08/01/2011	22:55	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	06/17/2012	18:45	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/22/2012	18:45	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
WOLF LAKE	BECKER CO.	MN	07/25/2012	00:15	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	08/03/2012	18:35	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
SHOREHAM	BECKER CO.	MN	08/03/2012	18:50	CST-6	Thunderstorm Wind	70 kts. EG	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	05/14/2013	06:13	CST-6	Thunderstorm Wind	61 kts. MG	0	0	0.00K	0.00K
SNELLMAN	BECKER CO.	MN	06/20/2013	21:35	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	07/06/2014	00:10	CST-6	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
TWO INLETS	BECKER CO.	MN	07/21/2014	21:35	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	09/20/2014	13:30	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
PONSFORD	BECKER CO.	MN	09/20/2014	13:48	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Totals:								0	0	878.20K	200.00K

Tornado Data from National Climatic Data Center from 1/1/1964 to 4/30/2015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	4	3.225M	270.00K
BECKER CO.	BECKER CO.	MN	09/09/1964	17:40	CST	Tornado	F1	0	1	25.00K	0.00K
BECKER CO.	BECKER CO.	MN	05/05/1965	18:46	CST	Tornado	F2	0	0	25.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/23/1966	14:45	CST	Tornado	F0	0	0	0.03K	0.00K
BECKER CO.	BECKER CO.	MN	09/05/1969	18:45	CST	Tornado	F0	0	0	0.00K	0.00K

BECKER CO.	BECKER CO.	MN	06/16/1973	21:40	CST	Tornado	F1	0	0	250.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/31/1973	19:12	CST	Tornado	F0	0	3	25.00K	0.00K
BECKER CO.	BECKER CO.	MN	08/20/1975	19:00	CST	Tornado	F1	0	0	2.500M	0.00K
BECKER CO.	BECKER CO.	MN	04/15/1976	18:00	CST	Tornado	F1	0	0	25.00K	0.00K
BECKER CO.	BECKER CO.	MN	07/10/1981	18:26	CST	Tornado	F0	0	0	0.03K	0.00K
BECKER CO.	BECKER CO.	MN	07/10/1981	19:00	CST	Tornado	F0	0	0	0.03K	0.00K
BECKER CO.	BECKER CO.	MN	06/09/1991	15:07	CST	Tornado	F1	0	0	0.00K	0.00K
Lake Park	BECKER CO.	MN	06/25/1994	14:14	CST	Tornado	F0	0	0	0.00K	0.00K
Callaway	BECKER CO.	MN	06/25/1994	14:25	CST	Tornado	F0	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/05/1996	16:15	CST	Tornado	F1	0	0	50.00K	50.00K
OGEMA	BECKER CO.	MN	07/20/1998	15:30	CST	Tornado	F0	0	0	0.00K	0.00K
ROCHERT	BECKER CO.	MN	07/20/1998	16:05	CST	Tornado	F0	0	0	20.00K	0.00K
DETROIT LAKES	BECKER CO.	MN	07/25/1999	13:39	CST	Tornado	F0	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	07/25/2000	12:27	CST	Tornado	F0	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	08/26/2002	19:15	CST	Tornado	F0	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/06/2003	15:37	CST	Tornado	F0	0	0	0.00K	0.00K
OGEMA	BECKER CO.	MN	06/06/2003	15:56	CST	Tornado	F0	0	0	0.00K	0.00K
FRAZEE	BECKER CO.	MN	05/11/2004	19:25	CST	Tornado	F0	0	0	0.00K	0.00K
SHOREHAM	BECKER CO.	MN	05/11/2004	20:05	CST	Tornado	F1	0	0	0.00K	0.00K
CORMORANT	BECKER CO.	MN	07/12/2004	22:13	CST	Tornado	F0	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/23/2005	18:28	CST	Tornado	F1	0	0	0.00K	0.00K
OSAGE	BECKER CO.	MN	06/26/2005	14:35	CST	Tornado	F0	0	0	0.00K	0.00K
LAKE PARK	BECKER CO.	MN	06/29/2005	16:09	CST	Tornado	F1	0	0	0.00K	0.00K
MIDWAY	BECKER CO.	MN	06/12/2008	17:40	CST-6	Tornado	EF0	0	0	100.00K	100.00K
TWO INLETS	BECKER CO.	MN	06/12/2008	19:44	CST-6	Tornado	EF1	0	0	200.00K	100.00K
FRAZEE	BECKER CO.	MN	07/11/2008	15:12	CST-6	Tornado	EF0	0	0	5.00K	20.00K
Totals:								0	4	3.225M	270.00K

Winter Storm Data from National Climatic Data Center for 1/1/1964 to 4/30/3015

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/17/1996	15:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/10/1996	10:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/27/1996	10:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER	WEST BECKER	MN	03/23/1996	19:00	CST	Blizzard		0	0	0.00K	0.00K

(ZONE)	(ZONE)										
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/16/1996	16:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/16/1996	16:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/17/1996	01:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/04/1997	00:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/04/1997	00:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/04/1997	18:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/09/1997	14:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/09/1997	14:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/15/1997	09:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/15/1997	09:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/21/1997	22:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/21/1997	22:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/03/1997	02:00	CST	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/13/1997	04:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/13/1997	04:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/13/1998	09:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/31/1998	17:00	CST	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/31/1998	17:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/01/1998	00:00	CST	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/01/1998	00:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/10/1998	06:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/10/1998	06:00	CST	Blizzard		0	0	0.00K	0.00K

EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/16/2000	03:25	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/16/2000	09:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/20/2000	11:47	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/27/2000	22:00	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/27/2000	22:00	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/29/2001	22:00	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/29/2001	22:00	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/23/2001	19:15	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/23/2001	19:15	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/24/2001	23:08	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/24/2001	23:08	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/23/2001	03:00	CST	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	10/24/2001	10:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	10/25/2001	09:00	CST	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/26/2001	15:35	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/26/2001	15:35	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/08/2002	15:35	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/08/2002	15:35	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/11/2003	09:55	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/15/2003	11:05	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/15/2003	11:05	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/24/2004	15:25	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER	WEST BECKER	MN	01/24/2004	15:25	CST	Winter Storm		0	0	0.00K	0.00K

(ZONE)	(ZONE)										
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/30/2004	04:50	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/30/2004	04:50	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/31/2004	15:35	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/31/2004	15:35	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/01/2005	00:00	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/01/2005	00:00	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/21/2005	04:20	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/21/2005	04:20	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/27/2005	12:29	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/27/2005	12:29	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/28/2005	16:08	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/28/2005	18:34	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/29/2005	20:04	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/29/2005	20:04	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/24/2006	09:00	CST	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/24/2006	07:58	CST	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/24/2006	07:58	CST	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/24/2007	09:30	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/24/2007	09:30	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/27/2007	15:36	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/27/2007	15:36	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/01/2007	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K

EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/01/2007	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/03/2007	12:58	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/03/2007	12:58	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/30/2007	21:18	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/01/2007	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/01/2007	04:30	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/04/2007	10:30	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/04/2007	10:30	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/17/2008	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/17/2008	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/29/2008	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/29/2008	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/09/2008	08:27	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/09/2008	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/09/2008	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/19/2008	16:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/19/2008	16:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/05/2008	16:38	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/05/2008	17:38	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/10/2008	13:30	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/10/2008	13:30	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/25/2008	13:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER	EAST BECKER	MN	04/25/2008	13:00	CST-	Winter Storm		0	0	0.00K	0.00K

(ZONE)	(ZONE)				6						
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/13/2008	04:03	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/13/2008	04:03	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/15/2008	04:01	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/15/2008	04:01	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/19/2008	14:20	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/19/2008	14:20	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/29/2008	20:51	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/29/2008	20:51	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/02/2009	15:43	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/02/2009	15:43	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/26/2009	08:42	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/26/2009	08:42	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/09/2009	14:56	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/09/2009	14:56	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/24/2009	21:05	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/24/2009	21:05	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/29/2009	14:27	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/29/2009	14:27	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	10/30/2009	14:00	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/23/2009	04:10	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/23/2009	04:10	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/22/2010	11:54	CST-6	Winter Storm		0	0	0.00K	0.00K

WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/22/2010	11:54	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/25/2010	04:19	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/25/2010	04:19	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/06/2010	15:52	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/06/2010	15:52	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	10/26/2010	18:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	10/26/2010	18:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/22/2010	07:23	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	11/29/2010	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	11/29/2010	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/19/2010	14:46	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/19/2010	14:46	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/30/2010	12:16	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/30/2010	12:16	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/31/2010	04:20	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/31/2010	04:20	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/01/2011	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/01/2011	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/21/2011	00:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/01/2011	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/11/2011	22:00	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/22/2011	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER	WEST BECKER	MN	03/22/2011	12:00	CST-	Winter Storm		0	0	0.00K	0.00K

(ZONE)	(ZONE)				6						
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/18/2012	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/18/2012	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/26/2012	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/26/2012	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/28/2012	18:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/28/2012	18:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/20/2013	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/20/2013	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/28/2013	14:33	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/28/2013	14:33	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/10/2013	06:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/10/2013	06:00	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/03/2013	23:30	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/03/2013	23:30	CST-6	Heavy Snow		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/09/2013	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/17/2013	16:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/17/2013	16:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/14/2013	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/14/2013	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/02/2013	21:31	CST-6	Heavy Snow		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/03/2013	04:54	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/03/2013	04:54	CST-6	Winter Storm		0	0	0.00K	0.00K

EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/06/2013	15:29	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/06/2013	15:29	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	12/28/2013	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	12/28/2013	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/03/2014	21:00	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/04/2014	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/04/2014	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/16/2014	03:00	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/22/2014	06:00	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/22/2014	15:38	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/22/2014	15:38	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/26/2014	06:00	CST-6	Blizzard		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/26/2014	06:00	CST-6	Blizzard		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/26/2014	22:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/26/2014	22:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/26/2014	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/01/2014	15:03	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/01/2014	15:03	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	03/31/2014	06:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	03/31/2014	06:00	CST-6	Winter Storm		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	04/01/2014	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	04/01/2014	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
WEST BECKER	WEST BECKER	MN	01/03/2015	14:49	CST-	Extreme Cold/wind		0	0	0.00K	0.00K

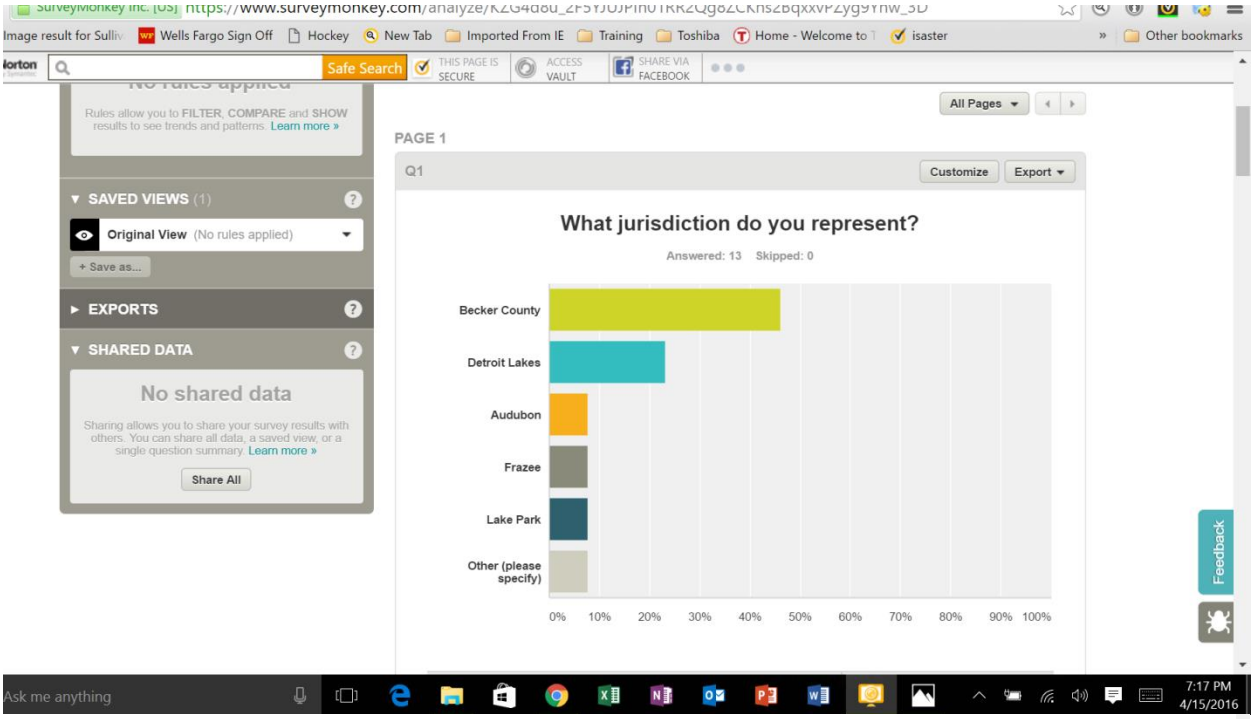
(ZONE)	(ZONE)				6	Chill					
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/03/2015	14:49	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	01/06/2015	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	01/06/2015	18:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
WEST BECKER (ZONE)	WEST BECKER (ZONE)	MN	02/21/2015	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
EAST BECKER (ZONE)	EAST BECKER (ZONE)	MN	02/21/2015	21:00	CST-6	Extreme Cold/wind Chill		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

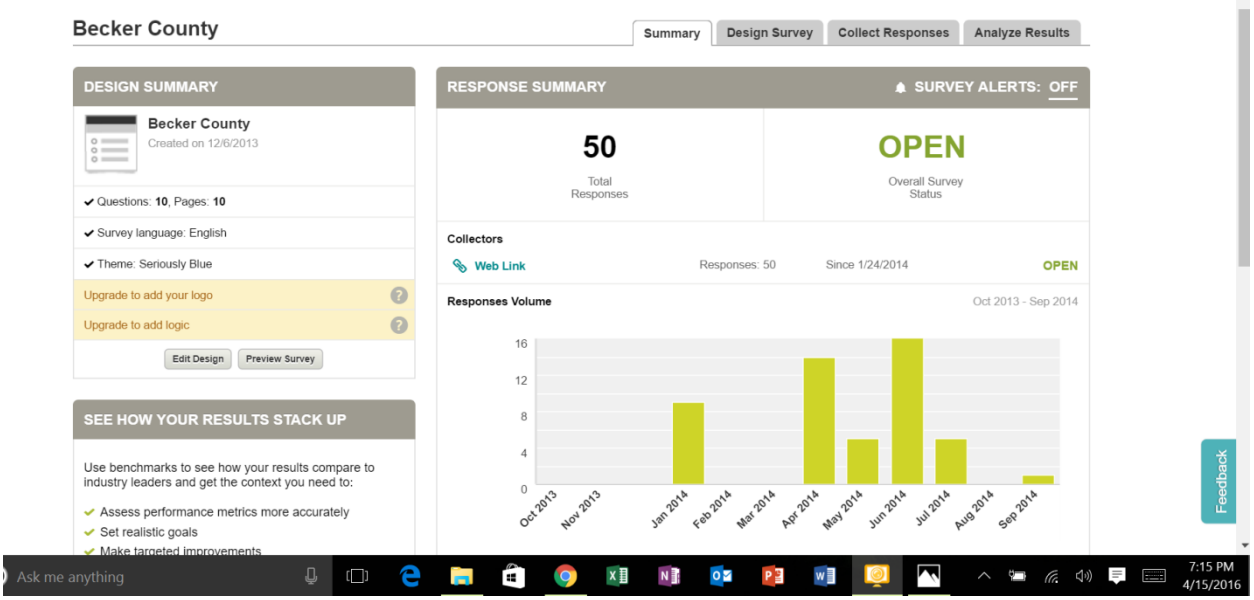
Wildfire Data from National Climatic Data Center for 1/1/1964 to 4/30/2015

No wildfires per NCDC

Appendix C: Participation

Public Survey: Jurisdiction Representation and Response Rate:





Sample Survey for Jurisdictional Participation:

CAPABILITY SELF-ASSESSMENT SURVEY

Item 2

Steering Committee Meeting

What is A Capability Assessment

The purpose of conducting a capability assessment is to determine the ability of a given jurisdiction to implement a mitigation strategy. As in any planning process, based on an understanding of those jurisdictions that are tasked with strategy implementation, it is important to know what actions are feasible. More specifically, the capability assessment helps to determine what mitigation actions are likely to be implemented over time given the fiscal, technical, administrative and political framework of the Jurisdiction. It also provides an opportunity to assess existing plans, policies and processes in place.

What follows is a basic self-assessment survey that will allow us to identify the extent of continuity, advantages and strengths existing within your cities and County.

Conducting the Capability Self-Assessment Survey

The Capability Assessment takes approximately 30 minutes to an hour to complete. The survey is comprised of three parts:

1. An evaluation of existing plans, policies and ordinances. (Part 1)
2. An assessment of Jurisdictional capabilities. (Part 2)
3. In-kind Match data collection. (Part 3)

Part 1- Existing Plans Policies and Ordinances:

Part 1 of the self-assessment is meant to identify existing plans utilized in the governance of your jurisdiction.

- Within table one (Existing Plans Policies and Ordinances); please identify your jurisdiction by placing an X in the column directly to the right of the city name.
- Within table one, find and review the row identified as "Plans, Policies and Ordinances." If you are unsure of the acronyms used in the table, please consult the key located at the top of the table.
- Moving across the row from your jurisdiction, with an X indicate what plans, policies and ordinances exist and or are used by your jurisdiction. If you are unsure if a certain plan, policy and ordinance is used simply, leave the column blank.
- While plans, policies and ordinances may exist, sometimes they exist in name only. Meaning while plans, policies and ordinances might exist, they may not be used in the governance of your Jurisdiction. **In the very last Column** "Score" Indicate to the best of your ability, the degree to which you believe the totality of the plans, policies and ordinances you noted as existing are actually utilized. Please use "H" for highly used; "M" for moderately used and an "L" for low use.

Relevant Plans and Programs in Place	

• HMP: Hazard Mitigation Plan • DRP: Disaster Recovery Plan • CLUP: Comprehensive Land Use Plan • FMP: Floodplain Management Plan • SMP: Stormwater Management Plan • EOP: Emergency Operations Plan • COOP: Continuity of Operations Plan • SARA: SARA Title III Emergency Response Plan • TRANS: Transportation Plan	• CIP: Capital Improvements Plan (that regulates infrastructure in hazard areas) • COMP: comprehensive PLAN • REG-PL: Regional Planning • HPP: Historic Preservation Plan • ZO: Zoning Ordinance • FDPO: Flood Damage Prevention Ordinance • NFIP: National Flood Insurance Program • BC: Building Codes
DENOTES Multi-Jurisdictional Plan	

Jurisdiction	HMP	DRP	CULP	FNDNDMP	SMP	EOP	COOP	SARA	TRANS	CIP	COMP	REG-PL	HPP	ZO	FDPO	NFIP	BC	Score
Audubon																		
Calloway																		
Detroit Lakes																		
Frazee																		
Lake Park																		
Becker Co.																		

Part 2 Assessment of Local Capability:

Part two of this self-assessment is used to determine the technical, administrative/institutional, fiscal and political capabilities of your jurisdiction.

- Please review the capability definitions below (technical, administrative/institutional, fiscal and political).
- Within table two, please identify your jurisdiction by placing an X in the column directly to the right of the city name.
- Locate the categories (technical, administrative/institutional, fiscal and political) at the top of the table. With the row assigned to your jurisdiction indicate what you believe are your Jurisdiction's capabilities. Use "H" for a high level of capability; "M" for a moderate level of capability and "L" for a low level of capability.
- NOTE there are no right or wrong answers!

Capability Definitions:

- **Technical capability** can be defined as possessing the skills and tools needed to improve decision-making, including the development of sound mitigation actions.
- **Fiscal capability** or the ability to take financial action is closely associated with the amount of money available to implement policies and projects. This may take the form of grants received or state and locally based revenue.
- **Administrative and institutional capability** is defined as jurisdictions staffing abilities and the existing organizational structures needed to implement mitigation strategies.

- **Political capability** is the level of interest that both the citizens and government officials of a given jurisdiction has in conducting mitigation projects.

Assessment of Local Capability Table 2

Assessment of Local Capability— multi Jurisdictional Hazard Mitigation Plan				
An "L" indicates low capability; an "M" indicated moderate capability; and an "H" indicates high capability.				
Jurisdiction	Technical Capability	Fiscal Capability	Administrative Capability	Political Capability
Audubon				
Callaway				
Detroit Lakes				
Frazee				
Lake Park				
Becker Co.				

Part three of this self-assessment survey is meant as a way to fulfill the County's obligation in providing in-kind match. As such, please provide the requested information.

Please indicate the amount of time spent completing this self-assessment: _____

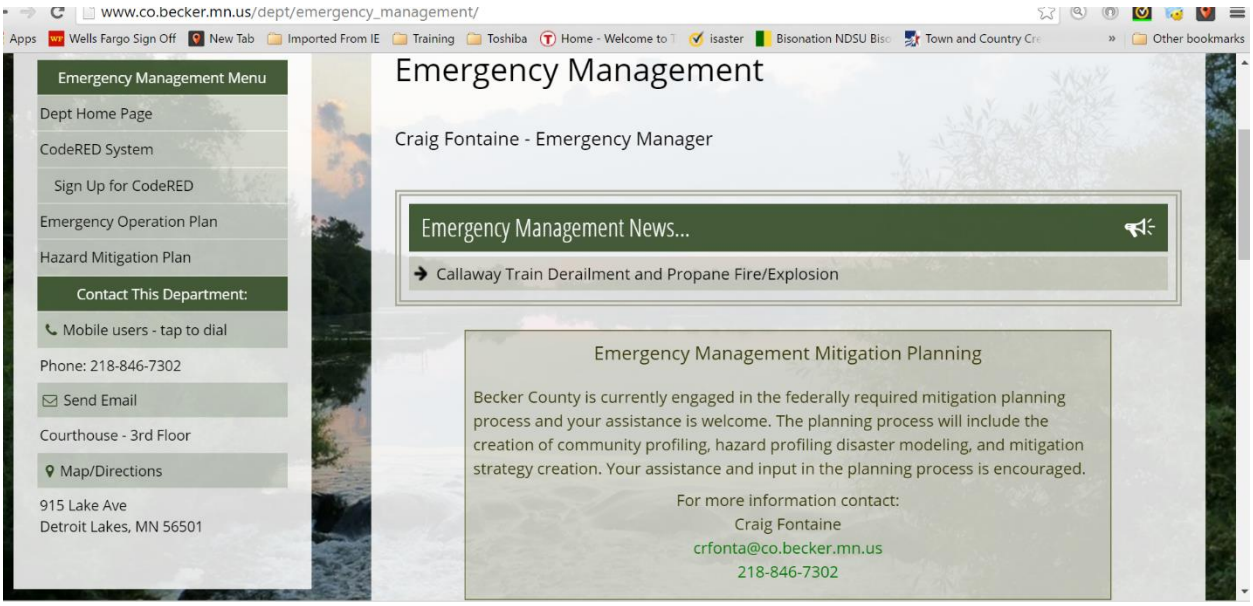
Please provide the date you completed the document: _____

Please provide your Official Title: _____

Please print your name: _____

Thank you for your time and effort! If you have any questions, please contact Craig Fontaine Becker County Emergency Manager.

Becker County Webpage with a request for public participation: Note this Solicitation for participation was updated throughout the update process.



County Paper of Record Requesting Public Participation and Review:

Client:

BECKER COUNTYEMERGENCY MANAGEMENT

Account # 363971 Ad # 2319756

Phone: (218) 846-7302

Fax:

Address: 915 LAKE AVENUE

DETROIT LAKES, MN 56501

Sales Rep.:

0400 Detroit Lakes House Account

Phone: (218) 847-3151

Fax: (218) 847-9409

Email: ads@dlnewspapers.com

Class.: 9960 MINNESOTA LEGALS

Requested By:

Start Date: 05/18/2016

End Date: 05/29/2016

Nb. of Inserts: 16

Dimensions: 2 col. x 1.25 Inches

Publications: Detroit Lakes Tribune

DL Group web sites

Total Price: $167.00

Paid Amount: $0.00

Balance: $167.00

Page 1 of 1

BECKER COUNTY EMERGENCY MANAGEMENT NOTICE

Becker County and the Cities of Audubon, Callaway, Frazee, and Lake Park invite your input on the final version of the updated Becker County Hazard Mitigation Plan. For those wishing to participate in this opportunity the plan can be found at the Becker County Emergency Management Office (915 Lake Ave. Detroit Lakes, Minnesota 56501) or online at:
http://www.co.becker.mn.us/dept/emergency_management/
Input will be accepted up until 14 days upon the date of this announcement. If you have any questions please contact Craig Fontaine (Becker County Emergency Manager) at 218-846- 7302 or crfonta@co.becker.mn.us
T-May 18, 22, 25, 29_____2319756

Attendance Records:

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 2/25/2014 **Time Held:** 1000 **to** 1100

City/ County Location: Detroit Lakes, Becker County **Purpose:** Mitigation

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
Dick Gordmanson	[illegible]	Safety Director
[illegible]	[illegible]	[illegible]
Nick Courneya	[illegible]	Frazee High School
Steve Skaug	[illegible]	Becker Co. [illegible]
Patty Swenson	[illegible]	Becker Co Planning Zoning
Renae Niemi	[illegible]	BC Community Health
Tom Alinder	[illegible]	[illegible]
Nancy Young	Nancy Young	American Red Cross
Roger [illegible]	[illegible]	MinDak Chapter ARC
Ronda M. Stock	[illegible]	Becker County Community Health

Reported by: [illegible] **Agency:** Becker County Emergency Mgmt
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
9 Number of Attendees x 1 Number of Hours x $19.75/ hour = $177.75 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 2/25/2014 **Time Held:** 8:00 AM **to** 5:45 PM

City/ County Location: Detroit Lakes, Becker County **Purpose:** Present mitigation plan to township officers

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
James L. Davidson	[illegible]	Supervisor
Bill Gunderman	[illegible]	Supervisor
[illegible] Johnson	[illegible]	Supervisor
[illegible]	Carolyn Kahler	Clerk
Shirley Davidson	[illegible]	Resident
Rick Billett	[illegible]	Burlington Twp
Jim Thompson	[illegible]	Erie
Wayne [illegible]	[illegible]	Lake Eunice
[illegible]	[illegible]	Burlington
Robert [illegible]	[illegible]	Wolf Lake City
[illegible]	[illegible]	[illegible]
Pat [illegible]	[illegible]	Eagle View
Lynn Lindow	[illegible]	Toad Lake
[illegible]	[illegible]	Erie
[illegible]	[illegible]	Environmental Services
Barb Moser	[illegible]	[illegible]
[illegible] B. Knopf	[illegible]	Lake View Twp.
Jerry Wetter	[illegible]	Round Lake
Dave Christianson	[illegible]	Round Lake
Rana Holmer	[illegible]	Evergreen Clerk
[illegible] Kemper	[illegible]	[illegible]
[illegible]	[illegible] Hansen	[illegible]
Galen Walters	[illegible]	Two Inlets
Michael Lockhart	[illegible]	Walworth

Reported by: [illegible] **Agency:** Becker County Emergency Management.
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
24 Number of Attendees x .75 Number of Hours x $19.75/ hour = $355.50 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 2/25/2014 **Time Held:** 18:00 **to** 20:45

City/ County Location: Detroit Lakes, Becker County **Purpose:** Present mitigation plan to township officers

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
Randy Moore	[illegible]	Walworth
Doug Fabre	[illegible]	White Earth
Carol Fabre	[illegible]	"
[illegible]	[illegible]	Erie
David Feld	[illegible]	Wolf Lake
Warren [illegible]	Warren [illegible]	Walworth
[illegible]	[illegible]	Richwood
Sandy Gunderson	[illegible]	[illegible]
[illegible]		Cormorant
[illegible]		Cormorant
Duane Olson	[illegible]	Cormorant

Reported by: [illegible] **Agency:** Becker County Emergency Management
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
11 Number of Attendees x .75 Number of Hours x $19.75/ hour = $162.95 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 10/16/2015 **Time Held:** 13:00 **to** 14:00

City/ County Location: Detroit Lakes, Becker County **Purpose:** Hazard Mitigation

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
Craig Fontaine	[illegible]	Becker County
Steve Skaug	[illegible]	Becker Co. [illegible]
Renae Niemi	[illegible]	Community Health
[illegible]	[illegible]	[illegible]
Dick Gordmanson	[illegible]	Co. Safety Dir.
Patty Swenson	[illegible]	Becker County
Ed Jansen	[illegible]	Am Red Cross
Ronda Stock	[illegible]	Becker Co Comm Health
[illegible]	[illegible]	BCSO
John Sieling	[illegible]	BCSO
Kelly Shannon	[illegible]	BCSO
Joan Stenger	[illegible]	BCSO - Dispatch
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Jim Olson	[illegible]	Becker County

Reported by: [illegible] **Agency:** Becker County Emergency Mgmt
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
13 Number of Attendees x 1 Number of Hours x $19.75/ hour = $256.75 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 12-5-2013 **Time Held:** 13:00 to 16:00

City/ County Location: Detroit Lakes Becker County **Purpose:** Hazard Mitigation Meeting

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
Dick Goodmanson	[illegible]	County Safety
Roger Winter	[illegible]	Becker [illegible]
Tom Alinder	[illegible]	Essentia Health St. Mary's Hospital
[illegible]	[illegible]	Community Health
[illegible]	[illegible]	[illegible]
Todd Glander	[illegible]	Becker Co. Sheriff Office
[illegible]	[illegible]	Wild Rice Electric
Paul Dean Paul Thom		Frazee Fire
[illegible]	[illegible]	Becker County Em
[illegible]	[illegible]	American Red Cross
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	Building Maint.
[illegible]	[illegible]	Becker Co. S.D.
[illegible]	[illegible]	Becker Co.
Kelly Shannon	[illegible]	Becker Sheriff
Jim Olson	[illegible]	Becker Co. Hwy Dept.

Reported by: [illegible] **Agency:** Becker County Emergency Manager
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
15 Number of Attendees x 2 Number of Hours x $19.75/ hour = $ 592.50 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: April 6, 2016 **Time Held:** 7:00PM To 9:00PM

City/ County Location: Becker County **Purpose:** Plan update

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
Michael Johnson	[illegible]	City of Frazee
[illegible] Green	[illegible]	City of Detroit Lakes [illegible]
Jonathan Smith	[illegible]	City of Frazee
[illegible]	[illegible]	City of Lake Park
Brady Burnside	[illegible]	City of Lake Park
[illegible]	[illegible]	Becker County Em

Reported by: [illegible] **Agency:** Becker County Em
Signature

All- Hazard Mitigation Local In-Kind Match
Public Meeting Sign In Sheet
DR 4069.08

Date: 5/13/2014 **Time Held:** 13:00 to 15:00

City/County Location: Becker County **Purpose:** Mitigation

PRINT NAME	SIGNATURE	COMMUNITY AFFILIATION
[illegible]	[illegible]	City of D.L.
[illegible]	[illegible]	Becker Cty
Tom [illegible]	[illegible]	Becker Cty
Roger [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	Audubon City Council / Fire Dept
Brad Grant	[illegible]	Mayor City of Audubon
[illegible]	[illegible]	Becker County Emergency Management

Reported by: [illegible] **Agency:** Becker County Emergency Management
Signature

The match for participation by members of the public is $19.75/hour throughout the year 2013. HSEM will review DEED statewide wage data to determine the appropriate match. The formula for in-kind match for public meetings is:
6 Number of Attendees x 2 Number of Hours x $19.75/ hour = $237.00 In-Kind Match

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.

Note: County and City employees that are attending as part of the mitigation planning effort are to have their base and fringe salary documented for local cash match. Federal funded salary may not be used for match.