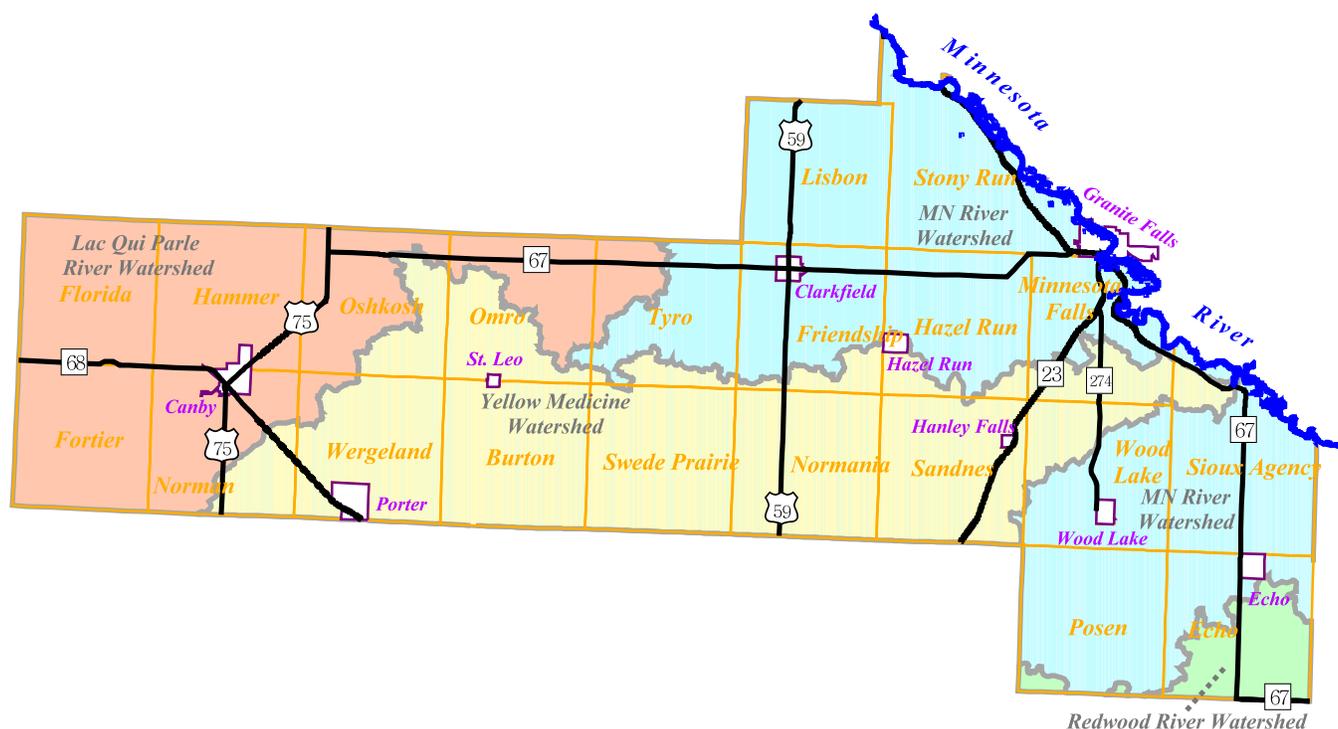


Yellow Medicine County

Local Water Plan



10 Year Plan: January 2005 - December 2014

5 Year Implementation: January 2005 - December 2009

*Prepared by Yellow Medicine County &
Midwest Community Planning, LLC*

**Yellow Medicine
Local Water Plan
Table of Contents**

Executive Summary iii

 Section A: The Purpose of the Yellow Medicine County Water Plan..... iii

 Section B: Yellow Medicine County’s Priority Water Plan Concerns iv

 Section C: Summary of the Goals & Actions iv

 General County Profile vi

 Yellow Medicine County Water Plan Committee Members vii

Chapter One: Assessment of Priority Concerns1

 Groundwater Protection Priority Issue1

 Groundwater Protection Assessment Summary20

 Erosion and Sediment Control Priority Issue21

 Erosion and Sediment Control Assessment Summary29

 Reducing Priority Pollutants Priority Issue29

 Reducing Priority Pollutants Assessment Summary36

 Managing Flooding Priority Issue37

 Managing Flooding Assessment Summary39

 Surface Water and Drainage Management Priority Issue39

 Surface Water and Drainage Management Assessment Summary43

Chapter Two: Goals, Objectives and Action Steps.....45

 Chapter Definitions.....45

 Priority Issue #1: Groundwater Protection46

Chapter Two, Continued...

Priority Issue #2: Erosion and Sediment Control48

Priority Issue #3: Reducing Priority Pollutants51

Priority Issue #4: Manage Flooding53

Priority Issue #5: Surface Water and Drainage Management54

Chapter Three: Ongoing Activities57

Chapter Four: Plan Administration.....59

LIST OF MAPS

Yellow Medicine County Cities, Townships and Major Watersheds ix

County Well Index and Potential Pollution Sources5

Water Erosion Prone Soils.....25

Wind Erosion Prone Soils.....27

Yellow Medicine County’s Flood Plain41

APPENDICES

Yellow Medicine County Scoping Document..... Appendix A

Regional Hydrogeologic Maps (cropped to Yellow Medicine County)..... Appendix B

Minnesota Riparian Landuse and Conservation Lands Summary..... Appendix C

YELLOW MEDICINE COUNTY WATER PLAN EXECUTIVE SUMMARY

Based upon the recently revised Board on Water and Soil Resource's Local Water Management Plan Guidelines, the Yellow Medicine 2005–2014 Water Plan is divided into the following four components:

- **Executive Summary.** This section includes the purpose of the local water management plan, description of the priority issues that are addressed in the plan, a summary of the Goals and Actions along with estimated total project costs. In addition, the executive summary contains a Yellow Medicine County general profile and a list of Yellow Medicine County's Water Plan Committee members.
- **Chapter One: Assessment of Priority Concerns.** This Chapter provides data regarding each of Yellow Medicine County's five priority concerns: Groundwater Protection; Erosion and Sediment Control; Reducing Priority Pollutants; Manage Flooding; and Surface Water and Drainage Management.
- **Chapter Two: Implementation Schedule.** This Chapter establishes Yellow Medicine County's Goals, Objectives and Action Steps. These are based on each of the high priority water planning issues identified in the County's Water Plan Scoping Document and assessed in Chapter One. Yellow Medicine County will implement the Goals and Objectives between 2005 and 2009. In addition, this Chapter contains a description of Yellow Medicine County's ongoing water plan-related activities.
- **Chapter Three: Plan Administration.** This Chapter contains information on plan administration, including plan coordination, implementation, schedule, the role of the County in implementation and the role of other agencies, resolving intergovernmental conflicts and amendments to the Water Plan.

Section A: The Purpose of the Yellow Medicine County Water Plan

The Comprehensive Local Water Management Act (Minnesota Statutes Chapter 103B) encourages counties to develop and implement a comprehensive water plan. Pursuant to the requirements of the law, this Plan:

- Covers the entire area of the county;
- Addresses water problems in the context of watershed units and groundwater systems;
- Is based upon principles of sound hydrologic management of water, effective environmental protection and efficient management;

- Is consistent with comprehensive water plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or groundwater system; and
- Must specify the duration of the plan not to be less than five years nor more than ten years. This Water Plan is a third generation plan that covers a ten-year period (2005–2014) with a five-year implementation plan (2005-2009).

Section B: Yellow Medicine County's Priority Water Plan Concerns

Yellow Medicine County's Water Plan Scoping Document (found in Appendix A) explains the process used to identify the County's priority concerns. The process began in November 2002, and ended nearly a year later with the official submittal of the County's Scoping Document. Within those 13 months, the County solicited comments from various local and state agencies, all of Yellow Medicine County's cities and townships, and a survey sent to every resident in the County. Finally, a number of public meetings were held to discuss water planning issues.

The Yellow Medicine County Water Plan Committee reviewed all of the comments received and grouped them into the following five categories:

1. **Groundwater Protection:** aiding public water suppliers with the development of wellhead protection plans and by providing assistance to help manage vulnerable areas from potential contamination sources.
2. **Erosion and Sediment Control** on agricultural lands located in the Yellow Medicine and Lac qui Parle Watersheds.
3. **Reducing Priority Pollutants**, nutrients and bacteria, related to feedlots and non-conforming individual sewage treatment systems.
4. **Manage Flooding** and its' effects minimizing losses associated with the flooding of agricultural lands.
5. **Surface Water and Drainage Management** by addressing runoff volume and water quality deterioration due to excessive runoff.

Section C: Summary of the Goals & Actions

The five priority issues identified in Section B served as the focus in the creation of the Goals, Objectives and Action Steps. Each of the five corresponding goals along with a number of sample action steps are summarized below. As Chapter Two explains, each action step includes information on who is responsible for implementation, when it should take place and how much it is

expected to cost (note that may State and Federal programs would need to be used in order to reach the estimated costs).

Groundwater Protection Goal:

“To Protect and Improve the Quality of Groundwater in the County”

Key Action Steps:

- ✓ Prioritize Wellhead Protection Areas for cost-share and other land use incentive programs
- ✓ Establish baseline groundwater quality by testing 20 private wells
- ✓ Cost-share the sealing of 20 abandoned wells each year
- § *The 14 groundwater actions steps identified in this Plan are estimated to cost nearly \$50,000 over the next five years*

Erosion and Sediment Control Goal:

“To Protect and Improve the Soil Resources and Surface Water in the County”

Key Action Steps:

- ✓ Plan BMPs for 20,000 cropland acres
- ✓ Establish 800 new acres of filter strips / buffers along ditches and streams
- ✓ Enroll 500 acres of cropland subject to severe erosion into existing programs
- ✓ Enroll 200 acres of pasture into prescribed grazing systems
- ✓ Restore 50 acres of wetlands into conservation programs
- § *The 11 erosion and sediment control actions steps identified in this Plan are estimated to cost nearly \$1.5 million over the next five years (State and Federal Programs will also be used)*

Reducing Priority Pollutants Goal:

“To Enhance the County’s Water Resources”

Key Action Steps:

- ✓ Develop nutrient and pesticide management plans, targeting 12,000 acres countywide
- ✓ Upgrade 50 Individual Sewage Treatment Systems per year
- ✓ Create a GIS layer of all septic systems installed in the County
- § *The nine reducing priority pollutants actions steps identified in the Plan are estimated to cost nearly \$1.75 million over the next five years (State and Federal Programs will also be used)*

Managing Flooding Goal:

“To Implement Sound Flood Management Strategies”

Key Action Steps:

- ✓ Address the smaller flood events (such as two- and five-year events) by restoring 75 acres of wetlands through various conservation programs
- ✓ Take flood prone land out of crop production by encouraging enrollment into land retirement programs
- ✓ Update the County’s Floodplain Ordinance to reflect changes made to the program and the official maps
- § *The six manage flooding actions steps identified in this Plan are estimated to cost nearly \$350,000 over the next five years*

Surface Water and Drainage Management Goal:

“To Implement Sound Surface Water and Drainage Management”

Key Action Steps:

- ✓ GPS all County and Judicial ditches and identify existing filter strips
- ✓ Gather data, create and maintain a database for each drainage system
- ✓ Seek funds to repair two or three small dams in the County
- ✓ A blind intake cost share program will be offered to landowners to replace 20 open intakes
- § *The seven surface water and drainage management actions steps identified in this Plan are estimated to cost nearly \$200,000 over the next five years*

General County Profile

Yellow Medicine County is located in West Central Minnesota along the South Dakota border. The County has nine cities and twenty-one townships (see Map 1). According to the 2000 Census, the County had 11,080 residents. The County has an area of 752 square miles, which amounts to 485,120 acres of land. Hammer-shaped, the County is 54 miles long from east to west, and from 12 miles north and south at the west end to 21 miles at the eastern boundary. The eastern boundary follows the Minnesota River and extends into the hammer shape, narrowing down to a twelve-mile dimension north and south running westward for thirty miles to the South Dakota border. Outside of the County’s nine communities, the countryside is primarily dominated by agricultural land uses.

The elevation is 1,714 feet in the southwest corner of the county, 1,380 feet in the northwest corner, 920 feet in the northeast tip of the county and 1,059 feet in the southeast corner. The highest point,

which is near the southwest corner, is 1,739 feet. The lowest point, which is where the Minnesota River flows out of the county, is about 860 feet. All of the county drains into the Minnesota River by way of the Yellow Medicine River, the Lac Qui Parle River, and small streams and ditches, which rise in the Coteau des Prairies, a long range of hills running from west of Lake Traverse in the north to the Iowa line in the south. The Lac Qui Parle River flows from southwest to northeast through the county, entering Lac Qui Parle County before discharging into the Minnesota River.

Yellow Medicine County Water Plan Committee Members

The following Yellow Medicine County Water Plan Committee members are recognized for their contributions to this Water Plan:

Lou Ann Nagel, Yellow Medicine SWCD
Willis Beecher, LQP - Yellow Bank Watershed District
Terry Renken, Yellow Medicine River Watershed District
Leonard Swenson, Lincoln Pipestone Rural Water System
Gene Eilers, Municipalities Representative
Alan Saltee, Township Representative
Gary Johnson, County Commissioner
Lewis Miller, Citizen
Delmar Mamer, Citizen
Randy Jacobson, Zoning Administrator
Jolene Johnson, Water Plan Coordinator

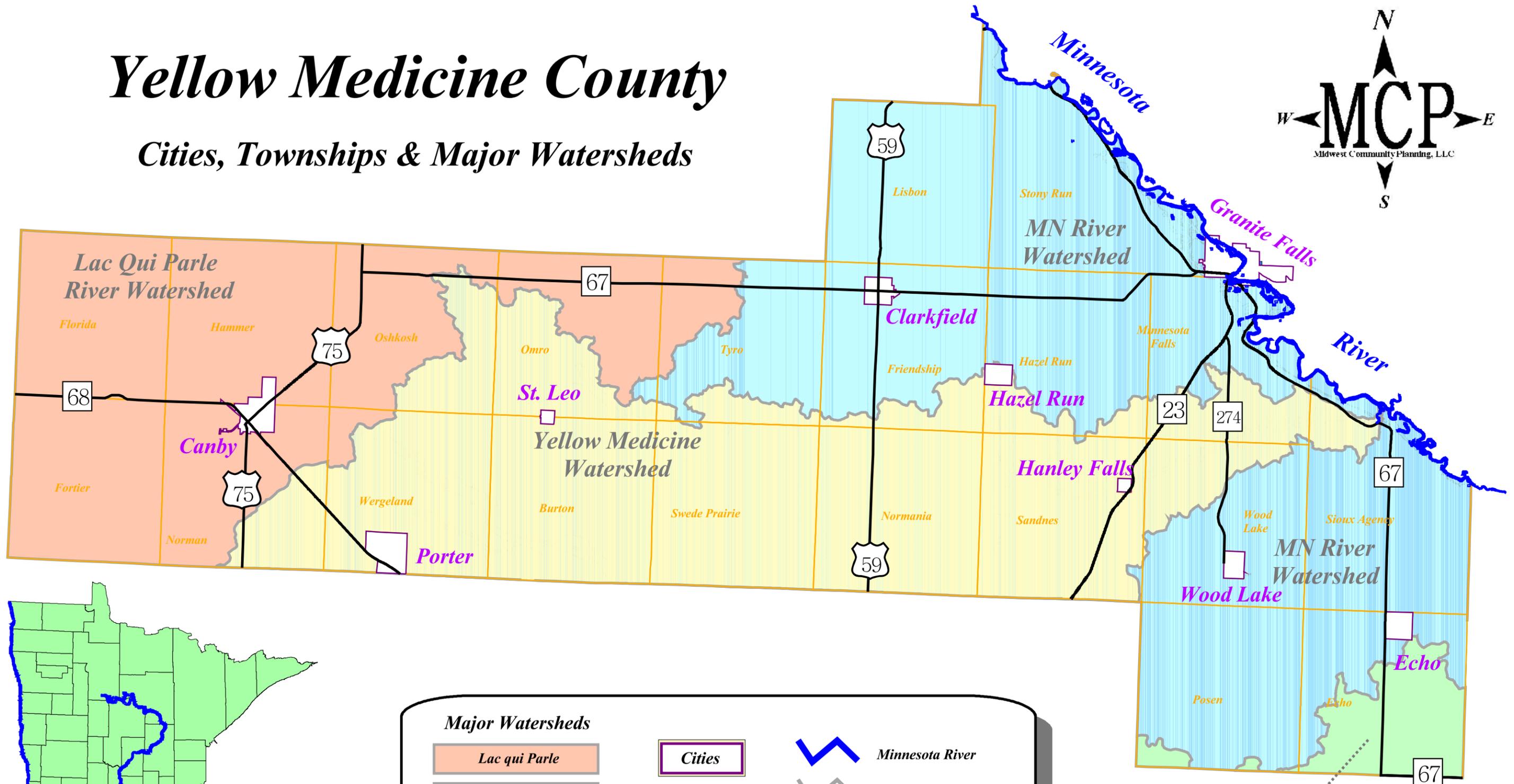
Ex-Officio Members

John Johnson, YMC Highway Department
David Sill, BWSR

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Yellow Medicine County

Cities, Townships & Major Watersheds



Major Watersheds		
	Lac qui Parle	
	MN River - Granite Falls	
	Redwood River	
	Minnesota River	

	Cities		Minnesota River
	Townships		Major Watershed
			Major Road

5 0 5 Miles

Redwood River Watershed

Chapter One: Assessment of Priority Concerns

This Chapter profiles and examines each of Yellow Medicine County's five priority water planning issues:

- ✓ *Groundwater Protection*
- ✓ *Erosion and Sediment Control*
- ✓ *Reducing Priority Pollutants*
- ✓ *Managing Flooding*
- ✓ *Surface Water and Drainage Management*

GROUNDWATER PROTECTION PRIORITY ISSUE

Regional Hydrologic Assessment

Yellow Medicine County was recently included in a Regional Hydrogeologic Assessment (RHA), along with Swift, Chippewa, Lac qui Parle, and parts of Big Stone, Lincoln, Lyon, Redwood, and Renville Counties (reference number RHA-4). A Regional Hydrogeologic Assessment is a formal study of an area's geology and groundwater resources, emphasizing the investigation of shallow geologic, groundwater and pollution sensitivity conditions. RHA's should not be confused with County Geologic Atlases, which investigate the properties and distribution of rocks and unconsolidated earth materials beneath the land surface. A Regional Hydrogeologic Assessment normally covers an area in size of between four to nine counties, while a Geologic Atlas is specific to one county. Each Regional Hydrogeologic Assessment or County Geologic Atlas produces a series of information and products, including the following:

- ✓ County Well Index Database
- ✓ Geology Maps
- ✓ Water Chemistry and Groundwater Maps
- ✓ Pollution Sensitivity Maps
- ✓ Geographic Information System Files
- ✓ Interpretive Reports

The County's RHA was completed in two parts. Part A, Geology, was completed in 1999 on a scale of 1:200,000 by the Minnesota Geological Survey. The contents include information on the County's surficial geology (Plate 1) and quaternary stratigraphy (Plate 2). Part B, Hydrology, was completed in 2000 at a scale of 1:200,000 by the Minnesota Department of Natural Resources, Division of Waters. The contents include information on the County's surficial hydrogeology (Plate 3) and geologic sensitivity to pollution near

surface groundwater (Plate 4). Appendix B contains copies of Plates 1, 3 and 4 that were cropped to show Yellow Medicine County's results.

**Regional Hydrogeologic Assessment Plate 4:
Geologic Sensitivity to Pollution Near Surface Groundwater**

As described at

http://www.dnr.state.mn.us/waters/groundwater_section/mapping/sensitivity.html

The Minnesota Department of Natural Resources (DNR) defines a sensitive area as a geographic area characterized by natural features where there is significant risk of ground-water degradation from activities conducted at or near the land surface (MS § 103H.101). The DNR has developed criteria and guidelines to assess sensitive areas to encourage a consistent approach to assessing geologic sensitivity in Minnesota (Geologic Sensitivity Workgroup, 1991). Assessments are based on the geologic and hydrogeologic factors that affect the ability of geologic materials to restrict the downward migration of contaminants to the ground water of interest. This approach is called geologic sensitivity.

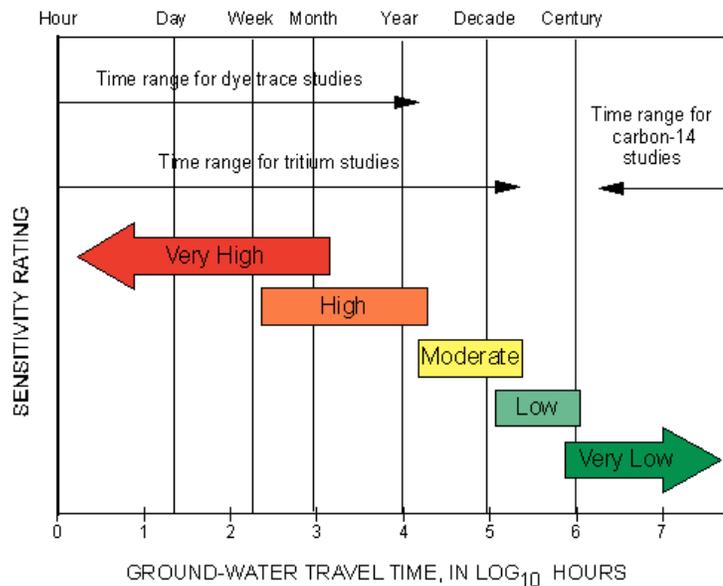
Groundwater sensitivity to pollution is best understood in relation to travel time, which is the approximate time that elapses from when a drop of water infiltrates the land surface until it enters an aquifer or reaches a specific target such as a spring. This is also often called residence time. Several techniques can be used to estimate the travel time of groundwater in an aquifer, including use of dye traces, radioactive and stable isotopes, and chlorofluorocarbons. Radiometric dating using radioactive isotopes of carbon (carbon-14) and hydrogen (tritium) are commonly used to estimate ground-water residence time (Alexander and Alexander, 1989). Estimated or measured travel times are inversely related to sensitivity: shorter travel times may indicate higher sensitivity and longer travel times may indicate lower sensitivity.

DNR Waters has defined five relative classes of geologic sensitivity (Very High, High, Medium, Low, and Very Low) that are based on overlapping time of travel ranges (see Figure 1). The pollution sensitivity of an aquifer is assumed to be inversely proportional to the time of travel. In addition, contaminants are assumed to travel at the same rate as water. 'Very High' sensitivity indicates that water moving downward from the surface may reach the ground-water system within hours to months. In these areas, there is little time to respond to and prevent aquifer contamination. Conversely, 'Low' sensitivity indicates there is time for a surface contamination source to be investigated, and possibly corrected, before serious groundwater pollution develops.

Relatively high sensitivity does not mean that water quality has been or will be degraded. If there are no contaminant sources, for example, pollution will not occur. Also, relatively low sensitivity does not guarantee that groundwater is or will remain uncontaminated. For instance, leakage from an abandoned well may bypass the natural protection of geologic materials, allowing contaminated water from one aquifer to directly enter another aquifer. The DNR Waters Criteria and Guidelines Report describes the process for preparing maps that show areas of relative sensitivity representing known or estimated subsurface

conditions. The maps are intended for use as screening tools and guides to indicate where additional information might be desirable to support land use or resource protection decisions. The Criteria and Guidelines Report discusses three types or "levels" of geologic sensitivity maps: Level 1 assessment - preliminary; Level 2 assessment - vadose zone materials; and Level 3 assessment - deeper aquifers. The three levels of pollution sensitivity assessment provide procedures to assess the geologic sensitivity of the water table as well as deeper aquifers. Selection of an assessment level depends on the groundwater of interest and the available information to conduct an assessment.

**Figure 1:
Groundwater Sensitivity**



Time of Travel Criteria

Geologic sensitivity ratings are based on the time required for water at or near the surface to travel vertically to the water table or other ground water of interest. Longer travel times imply a lower sensitivity to pollution. Dye trace, tritium, and carbon-14 studies can indicate the relative ages of ground water.

The Regional Hydrogeologic Assessment is an excellent source of information, however, local decision-makers and County staff need to have a better understanding of how to use it. The County's long-term goal is to actually use the RHA in the decision-making process. For example, it could be used to help locate a proposed water-intensive industry in an area of the County with suitable groundwater concentrations. In response to this issue, the

County has created an Action Step in Chapter Two to learn how to interpret and use the RHA and other water-based information in the decision-making process (with State agency participation). For more information on Yellow Medicine County's Regional Hydrogeologic Assessment, contact the Minnesota Geological Survey or the Department of Natural Resources at the following location:

Geology and Atlas Use
Minnesota Geological Survey
2642 University Avenue
St. Paul, MN 55114-1057
(612) 627-4780 or <http://www.geo.umn.edu/mgs>
Groundwater and Pollution Sensitivity
DNR Waters
500 Lafayette Road
St. Paul, MN 55155-4032
MN Toll Free 1-888-646-6367
<http://www.dnr.state.mn.us>

or visit the following website:

http://www.dnr.state.mn.us/waters/programs/gw_section/mapping/platesum/umrbrha.html

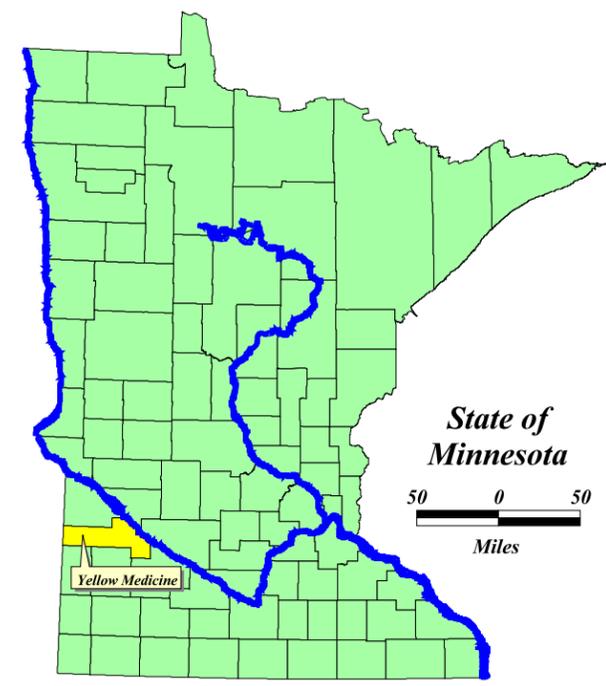
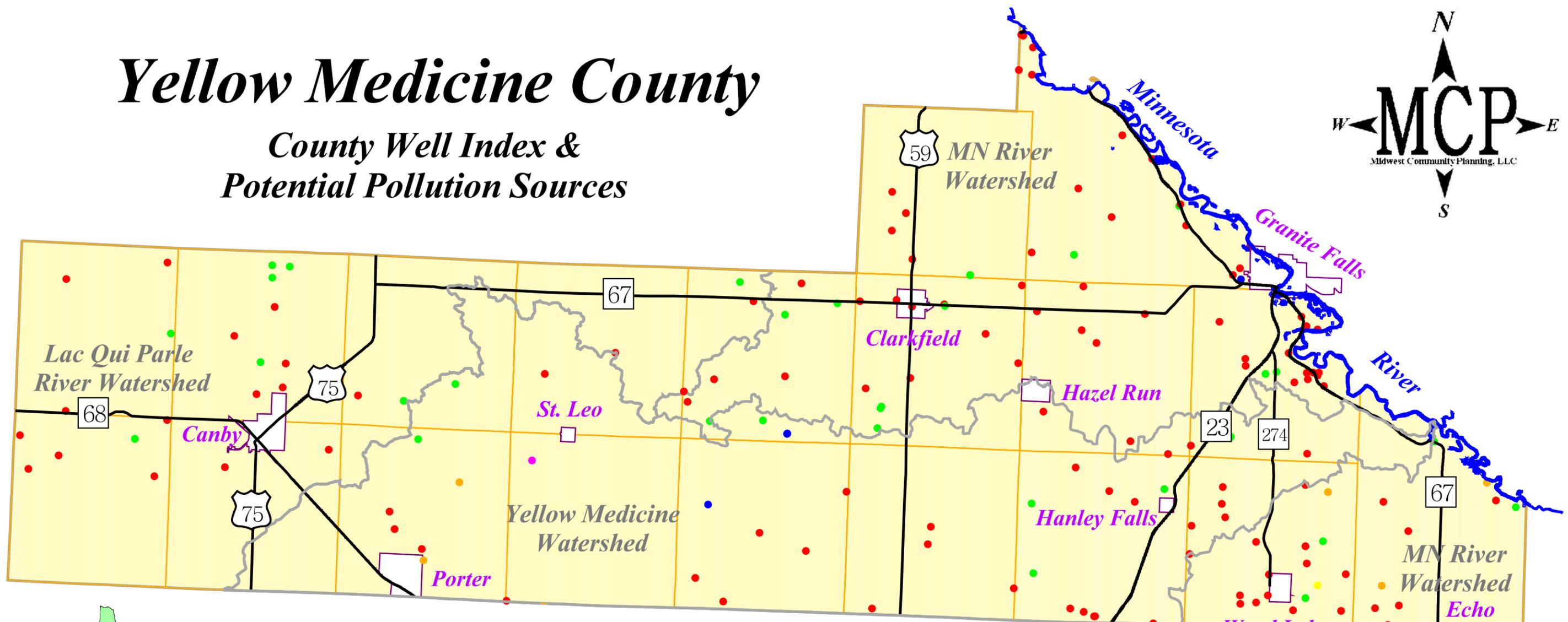
County Well Index

The County Well Index (CWI) data base represents the most complete listing of wells known in the State of Minnesota. A GIS database (referred to as "WWPTCALC") was created in order to provide a tool to map well attribute information (such as stratigraphy, groundwater levels, water chemistry, and water use), which are collected by the Minnesota Geologic Survey and other agencies. Specifically, this coverage contains wells which have not been field-verified and for which a location was calculated, based on the Public Land Survey coordinates reported by the driller on the water well driller log submitted to the Minnesota Department of Health. The current WWPTCALC point cover was created from the CWI file obtained from MGS December 28, 1998. At that time, approximately 167,000 records did not have field-verified locations; of these, 157,147 had viable locations (i.e., locations which represented valid combinations of township, range, and section values for Minnesota.)

The associated Index file contains information on well use, well depth, ownership, address, and geology from County Well Index. The information in County Well Index was entered by the Minnesota Geological Survey from the Water Well Driller Log form, which was submitted by the well driller to the Minnesota Department of Health at the time the well was constructed. Submission of a Water Well Driller Log is a requirement of the Minnesota Water Well Construction Code, passed by the State Legislature in 1974. While the County Well Index does not represent all wells in the State, it is the single most complete listing of wells.

Yellow Medicine County

County Well Index & Potential Pollution Sources



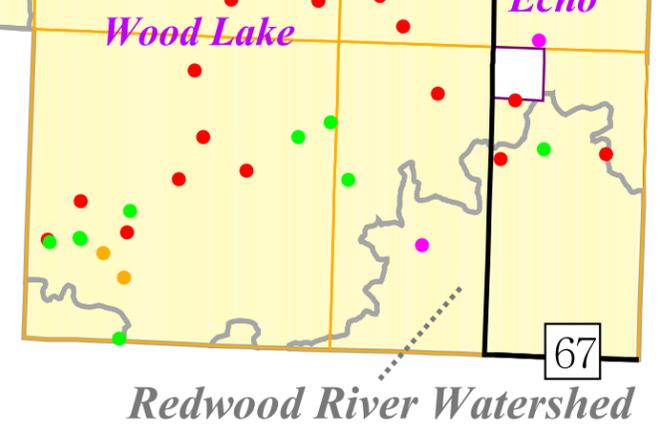
Well Index Legend

- Septic Tank / Drian Field
- Barnyard
- Body of Water
- Tanks
- "Other Potential Pollution Source"
- Well with Unidentified Potential Pollution Source

Map Symbols Legend

- Cities
- Townships
- ∩ Minnesota River
- ∩ Major Watershed
- ∩ Major Road

5 0 5 Miles



The Well Index contain a number of key attributes, from well depth to potential contaminant sources nearby (with estimated distances). By using the 1998 GIS database, Map 2 was created. This map represents the County's wells that had a potential pollutant reported nearby. The margin of error, however, is quite substantial. This is due to "reporter error" from estimating distances and from failure to report a potential contaminant. As a result, Map 2 should only be used for a general discussion on addressing potential well contaminants.

Most of the potential contaminants found in Map 2 were from Septic Tanks / Drain Fields (132 red dots on the Map) and from being close to Barnyards (42 green dots). The other categories found in Yellow Medicine County were Bodies of Water (4 blue dots), tank locations (3 purple dots) and a miscellaneous "other category (4 orange dots). The other grey dots represent the remaining 185 wells that did not have a potential pollutant reported nearby (again, this does not mean that a well should be considered "safe" from the various potential pollutants).

SOURCE WATER PROTECTION

As described at: <http://www.health.state.mn.us/divs/eh/water/swp/> and <http://www.mrwa.com/WHPforMN.htm>

The purpose of Source Water Protection is to help prevent contaminants from entering public drinking water sources. There are three primary parts to Minnesota's Source Water Protection Program:

- **Wellhead Protection**
- **Source Water Assessments**
- **Protection of Surface Water Intakes**

Wellhead Protection

Wellhead protection is a means of safeguarding public water supply wells by preventing contaminants from entering the area that contributes water to the well or wellfield over a period of time. The wellhead protection area is determined by using geologic and hydrologic criteria, such as the physical characteristics of the aquifer and the effects which pumping has on the rate and direction of groundwater movement. A management plan is developed for the wellhead protection area that includes inventorying potential sources of groundwater contamination, monitoring for the presence of specific contaminants, and managing existing and proposed land and water uses that pose a threat to groundwater quality.



A public water supply well provides piped drinking water for human use to 15 or more service connections or to 25 or more persons for at least 60 days a year. A public water supply well is further defined as either a community or noncommunity water supply well. A community water supply well serves 15 or more service connections used by year-round

residents or at least 25 year-round residents. Examples include municipalities, subdivisions, and nursing homes. Noncommunity water supply wells are divided into the following two groups:

- A ***nontransient noncommunity*** supply well serves at least 25 of the same people over six months of the year (examples include schools, factories, and hospitals).
- A ***transient noncommunity*** supply well serves all other public water systems (examples include restaurants, gas stations, and churches).

The Minnesota Groundwater Protection Act of 1989 grants the commissioner of health authority to develop wellhead protection measures for wells serving public water supplies. Also, the 1986 Amendments to the federal Safe Drinking Water Act require states to implement wellhead protection programs for public water wells. The Minnesota Department of Health (MDH) is the lead agency for administering Minnesota's wellhead protection program. However, wellhead protection will be effective only through the cooperation of state and local governments, public water suppliers, contaminant source owners, and general public.

The long-term goal is to implement wellhead protection measures for all public water supply wells. However, the large number of public water supply wells (13,000), the diversity of geologic conditions in Minnesota, and current resource constraints require that wellhead protection be implemented in phases. MDH began implementing wellhead protection measures in 1998 for new municipal community wells. Other existing community wells and other types of public water supply wells will be phased in as time and resources are available.

Owners of community and nontransient noncommunity wells, when notified by MDH or a new well is added to a municipal water supply system, must develop a wellhead protection plan which includes:

1. A map of the wellhead protection area,
2. A vulnerability assessment of the well and the wellhead protection area,
3. An inventory of potential sources of contamination within the wellhead protection area,
4. A plan to manage and monitor existing or proposed potential source(s) of contamination, and
5. A water supply contingency strategy.

As of June, 1996, 26 community water supplies in Minnesota spent over \$44 million to provide safe and adequate drinking water to their consumers following groundwater contamination of their wells. For communities where the population served is less than 1,000 people, the average cost per capita was \$1,336. For larger communities (i.e., greater than 1,000), the average cost per capita was \$336.

Source Water Assessments

Source Water Assessments are reports that provide a concise description of the water source - such as a well, lake, or river - used by a public water system and discuss how susceptible that source may be to contamination. The 1996 amendments to the federal Safe Drinking Water Act require states to produce source water assessments for all their public water systems and to make the results of those assessments available to the public. MDH has recently completed assessments for the over 7,000 public water systems in the state. The types of facilities for which assessments have been completed range from small businesses on their own well to large city water systems using several different water sources. Assessments are now available to the public on MDH's source water assessment web page (see the website listed below). You can search for an assessment either by name of the facility or by county. Table 1 recreates the search results for Yellow Medicine County.

<http://www.health.state.mn.us/divs/eh/water/swp/swa/index.htm>

Table 1:
Yellow Medicine County's Public Water Suppliers
(visit <http://156.98.150.16/swa/pdwmain.cfm>)

Public Water Supplier	ID	City	County
Bergen Lutheran Church	5870016	Granite Falls	Yellow Medicine
Canby	1870001	Canby	Yellow Medicine
Canby Golf Club	5870031	Canby	Yellow Medicine
Clarkfield	1870002	Clarkfield	Yellow Medicine
Echo	1870003	Echo	Yellow Medicine
Goodfellows	5870052	Montevideo	Yellow Medicine
Granite Falls	1870004	Granite Falls	Yellow Medicine
Granite Falls Golf Club	5870049	Granite Falls	Yellow Medicine
Hanley Falls	1870005	Hanley Falls	Yellow Medicine
Hazel Run	1870011	Hazel Run	Yellow Medicine
J.B. Yates	5870050	Granite Falls	Yellow Medicine
Porter	1870006	Porter	Yellow Medicine
Saint Leo	1870007	St. Leo	Yellow Medicine
St. Lucas Lutheran Church	5870029	Cottonwood	Yellow Medicine
Upper Sioux Agency State Park	5870046	Granite Falls	Yellow Medicine
Wood Lake	1870008	Wood Lake	Yellow Medicine
Number of PWS selected		16	

A brief overview of each source water assessment is provided for the public water suppliers found in Table 1. ***Please note that not all of the tables are complete!*** The Minnesota Department of Health will be completing the tables as information is obtained on each well. The following definitions apply to the tables presented:

Unique Well Number – a unique reference number assigned to each well.

Well ID# – some public water suppliers have more than one well location. As a result, each well has an identification number.

Depth – refers to the depth of the well.

Well Use – describes if the well is used as the public water’s primary source of water.

Aquifer – describes the geologic formation of the aquifer (if known).

Aquifer Sensitivity – Aquifer sensitivity refers to the degree of geological protection afforded the aquifer(s) used by the public water supply.

Well Sensitivity - Well sensitivity refers to the integrity of the well due to its construction and maintenance. It is based on the results of the well construction assessment. It can be one of the following:

- (1). The well is susceptible to contamination because it does not meet current construction standards or no information about well construction is available, regardless of aquifer sensitivity.
- (2). The well is not susceptible because it meets well construction standards and does not present a pathway for contamination to readily enter the water supply.

SWPA - Source Water Protection Area

Indicates whether a Source Water Protection Area has been designated for the well (the table will report either a ‘yes’ or ‘no’).

Public Water Supplier: Bergen Lutheran Church

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00262209	Well #1	36.0	Primary		High	See (1)	No

Aquifer sensitivity is considered high because either insufficient geologic information is available or existing information indicates the presence of vulnerable geologic conditions.

Source Description	Count
Building (Means a structure that does not contain any actual or potential contaminant sources.)	1
Electric transmission line	1
Grave	1
Septic tank	1

None of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring. A list of regulated contaminants can be found at <http://www.epa.gov/safewater>.

Public Water Supplier: Canby

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00241450	Well #7	170.0	Primary	Glacial Deposits	High	See (2)	No
00115503	Well #8	154.0	Primary	Glacial Deposits	Low	See (2)	No

Aquifer Sensitivity –

High - The glacial aquifer is considered to exhibit a high sensitivity to contamination because of the local geological setting.

Low - The glacial aquifer is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination.

Source Water Susceptibility - Source water susceptibility refers to the likelihood that a contaminant will reach the source of drinking water. It reflects the results of assessing well sensitivity, aquifer sensitivity, and water quality data.

Well 7 (high) is considered to exhibit a high susceptibility to contamination because of the local geological setting.

Well 8 (high) is considered to be susceptible because of the tritium content of the well water in glacial deposits.

One or more contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water. However, the water supplied to users meets state and federal drinking water standards for potability.

Public Water Supplier: Canby Golf Club

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00266327	Well #1		Primary		High	See (1)	No

Aquifer sensitivity is considered high because either insufficient geologic information is available or existing information indicates the presence of vulnerable geologic conditions. Source water susceptibility is considered high because insufficient information is available to determine the degree of geological protection that is afforded the source of drinking water. An inventory of potential contamination sources within 200 feet of the well(s) has not been completed. The source water may be susceptible to sources of nitrate, nitrogen and disease organisms such as septic systems, sewer pipes, and sewage holding tanks, among other sources such as fuel tanks, improperly sealed wells, over application of fertilizer, and runoff from surrounding properties.

Public Water Supplier: Clarkfield

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00102076	Well #5	139.0	Primary	Glacial Deposits	Low	See (2)	No
00148797	Well #6	130.0	Primary	Glacial Deposits	Low	See (2)	No

The glacial aquifer is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. None of the contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water.

Public Water Supplier: Echo

There is not much information in the Echo source water assessment. It does report that the source water susceptibility is considered high because insufficient information is available to determine the degree of geological protection that is afforded the source of drinking water. However, none of the contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water.

Public Water Supplier: Goodfellows

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00611223	Well #2	510.0	Primary	Bedrock	Low	See (2)	No

The bedrock aquifer is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. None of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring.

Public Water Supplier: Granite Falls

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00403980	Well #1	166.0	Primary	Glacial Deposits	Low	See (2)	No
00668467	Well #2	168.0	Primary	Glacial Deposits	Low	See (2)	No

The source of drinking water is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. In addition, none of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring.

Public Water Supplier: Granite Falls Golf Club

Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00651869	Well #2	499.0	Primary	Bedrock	Medium	See (2)	No

The lateral extent of fine-grained materials between the land surface and the source of drinking water does not appear to be persistent throughout the source water protection area. An inventory of potential contamination sources within 200 feet of the well(s) has not been completed. The source water may be susceptible to sources of nitrate, nitrogen and disease organisms such as septic systems, sewer pipes, and sewage holding tanks. Other sources such as fuel tanks, improperly sealed wells, over application of fertilizer, and runoff from surrounding properties may be of concern to water quality. None of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system, however, have been detected in the source water during required monitoring.

Public Water Supplier: Hanley Falls

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00209067	Well #2	286.0	Primary	Bedrock	Low	See (2)	No
00545003	Well #1	260.0	Primary	Bedrock	Low	See (2)	No

The source of drinking water is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. Past results indicate that at least one entry point from this community public water system will exceed the Arsenic Maximum Contaminant Level (MCL) of 10 ug/L. Arsenic is a naturally occurring contaminant that is found in west-central and northwestern Minnesota.

Public Water Supplier: Hazel Run

There is not much information in the Hazel Run source water assessment. It does report that the source water susceptibility is considered high because insufficient information is available to determine the degree of geological protection that is afforded the source of drinking water. However, none of the contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water.

Public Water Supplier: J.B. Yates

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00183776	Well #1	472.0	Primary	Bedrock	Low	See (2)	No

The source of drinking water is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. In addition, none of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring.

***Public Water Suppliers: Porter and St. Leo
(In the Lincoln-Pipestone Rural Water System)***

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00149160	Well #V1	62.0	Primary	Glacial Deposits	Low	See (2)	Yes
00149161	Well #V2	58.0	Primary	Glacial Deposits	Low	See (2)	Yes
00149163	Well #V3	67.0	Primary	Glacial Deposits	Low	See (2)	Yes
00149162	Well #V4	60.0	Primary	Glacial Deposits	Low	See (2)	Yes
00149182	Well #V5	69.0	Primary	Glacial Deposits	Low	See (2)	Yes
00505550	Well #H1	43.0	Primary	Glacial Deposits	High	See (2)	Yes
00505508	Well #H2	37.0	Primary	Glacial Deposits	High	See (2)	Yes
00505507	Well #H3	55.0	Primary	Glacial Deposits	High	See (2)	Yes
00505510	Well #H4	39.0	Primary	Glacial Deposits	High	See (2)	Yes
00505511	Well #H5	32.0	Primary	Glacial Deposits	High	See (2)	Yes
00440325	Well #B1	176.0	Primary	Glacial Deposits	Low	See (2)	No
00527475	Well #B2	223.0	Primary	Glacial Deposits	Low	See (2)	No
00527476	Well #B3	203.0	Primary	Glacial Deposits	Low	See (2)	No
00550052	Well #B4	453.0	Primary	Glacial Deposits	Low	See (2)	No
00607161	Well #H6	70.0	Primary	Glacial Deposits	High	See (2)	No
00637715	Well #B5	294.0	Primary	Glacial Deposits	Low	See (2)	No
00637716	Well #B6	323.0	Primary	Glacial Deposits	Low	See (2)	No
00634546	Well #B7	448.0	Primary	Glacial Deposits	Low	See (2)	No
00613137	Well #H7	82.0	Primary	Glacial Deposits	High	See (2)	Yes
00613136	Well #H8	72.0	Primary	Glacial Deposits	High	See (2)	Yes

The water supply for Lincoln-Pipestone Rural Water System is obtained from 20 primary wells (see the text box on the next page). The water supply system is implementing the wellhead protection plan that has been approved by the Minnesota Department of Health under Minnesota Rules 4720. One or more contaminants regulated under the federal Safe

Drinking Water Act for this public water supply system have been detected in the source water. However, the water supplied to users meets state and federal drinking water standards for potability.

Public Water Supplier: St. Lucas Lutheran Church

Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00262211	Well #1	90.0	Primary			See (1)	No

Source water susceptibility is considered high because insufficient information is available to determine the degree of geological protection that is afforded the source of drinking water. The following statement summarizes the types of potential contamination sources present in the inner wellhead management zone and the potential drinking water contaminants related to them:

Source Description	Count
Building (Means a structure that does not contain any actual or potential contaminant sources.)	1
Electric transmission line	1
Grave	1
LP Tank	1

None of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring.

Public Water Supplier: Upper Sioux Agency State Park

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00258021	Well #1 Main Well	285.0	Primary	Bedrock	Low	See (1)	No
00258023	Well #2 Shop	265.0	Primary	Bedrock	Low	See (1)	No
00564689	Well #3 Horse Riders Campground	73.0	Seasonal	Bedrock	Low	See (2)	No
00572654	Well #4 Yellow Medicine Campground	81.0	Seasonal	Glacial Deposits	Low	See (2)	No

The aquifers are covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. The following statement summarizes the

types of potential contamination sources present in the inner wellhead management zone and the potential drinking water contaminants related to them:

Source Description	Count
Building (Means a structure that does not contain any actual or potential contaminant sources.)	3
Drainfield - above or below grade	1
Electric transmission line	2
Pit	1
Privy	1
Petroleum storage tank, above ground, less than 1100 gallons	1
Septic tank	2

None of the contaminants regulated under the federal Safe Drinking Water Act for this type public water system have been detected in the source water during required monitoring.

Public Water Supplier: Wood Lake

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00240111	Well #2	215.0	Primary	Glacial Deposits	Low	See (2)	No

The source of drinking water is covered by one or more layers of fine-grained material that probably protect it from potential sources of contamination. None of the contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water.

Protection of Surface Water Intakes

The third main component to Minnesota’s Source Water Protection Plan is to develop protection plans for surface water intakes. Although not required, many of Minnesota's 24 community water supply systems that use surface water have expressed interest in developing protection plans. The Minnesota Department of Health is convening a work group to help determine how these plans should be prepared and who should approve them. There is great potential to incorporate protection plans with watershed management plans or river basin plans.

Abandoned Wells (visit <http://www.health.state.mn.us/divs/eh/wells/abandwel.html>)

A well that is not in use - or sometimes referred to an "abandoned" well - can be a potential threat to health, safety, and the environment. Wells that are no longer used may be buried or forgotten. Often they have not been sealed properly. Sealing is the process of clearing an unused well of debris and filling the well with a special material called grout. The sealing must be done by a licensed contractor.

Unused wells that have not been properly sealed can be a source of groundwater contamination, potentially affecting nearby drinking water wells. They may threaten the quality of the water in city water wells, your neighbor's well, or even your own well. Groundwater is the main source of drinking water for three out of every four Minnesotans. Protecting groundwater is everybody's business.

As a well ages, the casing may rust, joints may leak, the pump may become stuck in the well, or the well may fill with debris. If the well is covered with loose boards or concrete, the cover may eventually decay or break open. Surface water runoff, debris, and other contaminants can then enter the well. A well may be taken out of service for a variety of reasons. It may no longer provide enough water. It may not have been repaired when it needed to be. It may have become contaminated. A well may be "lost" or abandoned when property changes hands, or when use of the land changes from agricultural to industrial or residential. Old, unused wells are easily forgotten.

Groundwater is found in underground geologic formations called aquifers. Ordinarily the layers of rock and soil that lie between an aquifer and the surface, or between aquifers, act as a natural barrier against the spread of contamination. However, an unused, unsealed well can provide an open channel between the surface and an aquifer - or between a shallow aquifer and a deeper aquifer. An unused well can act as a drain - allowing surface water runoff, contaminated water, or improperly disposed waste to reach an uncontaminated aquifer.

If unsealed large-diameter wells are not covered or otherwise protected, the open well hole can be a safety hazard, especially for children and animals. By law, a well must be in use, be under a maintenance permit, or be sealed by a licensed contractor. A well must be sealed if:

1. the well is not in use,
2. the well is contaminated,
3. the well has been improperly sealed in the past,
4. the well threatens the quality of the groundwater, or
5. the well otherwise poses a threat to health or safety.

If you have an unused well - and wish to keep the well for future use - you must apply for a special "maintenance permit" from the Minnesota Department of Health (MDH). The permit requires an annual fee, and is only issued if the well meets minimum sanitary requirements.

Yellow Medicine County established a well sealing program during the early 1990s as a result of its first water plan. Through this program, the County's has sealed 541 wells and cost share of \$105,763 has been distributed.

For further information about source water protection, please contact:

Wellhead Protection Program - (651) 215-0800
Minnesota Department of Health
Source Water Protection Unit
Drinking Water Protection Section
PO Box 64975 - St. Paul, Minnesota 55164-0975

The Lincoln Pipestone Rural Water System

(As described at <http://www.lprw.com/>)

The Lincoln Pipestone Rural Water System (LPRW) was established in 1979 pursuant to Minnesota Statute 116A through a joint powers agreement pursuant to Minnesota Statute 471.59 and under the jurisdiction of the Fifth Judicial District. The MISSION of LPRW is

"To enhance the quality of life for the people in the southwest Minnesota area by acquiring and providing reliable, high quality, affordable water in an environmentally responsible manner through a publicly-owned system."

LPRW provides service in Lac qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Rock and Yellow Medicine Counties. LPRW's customer base, as of December, 2002, consists of: a) 2,820 rural customers using less than one million gallons per year per customer; b) 146 rural customers using more than one million gallons per year per customer; c) 20 incorporated cities; d) 4 unincorporated community water systems; and e) supplemental water supplied to Red Rock Rural Water and Marshall Municipal Utilities.

Water Production and Use: Water is produced from well fields near Burr, Verdi and Holland with a small reserve source at Edgerton. In 2002 an average of 3,736,000 gallons per day were produced across the system. This water served 2,992 customers and an estimated population of 16,200. At the Burr well field and treatment plant, average daily production was 1,265,000 gallons provided to 797 customers and an estimated population of 4,500. New water resources are being developed, and a major expansion is underway in the Burr Service Area. At the Verdi well field average daily production was 1,118,000 gallons provided to 1,134 customers and an estimated population of 7,670. The Verdi well field is the original LPRW water source, and water quality remains high enough so that treatment is not required. At the Holland well field and treatment plant, average daily production was 1,354,000 gallons provided to 1,061 customers and an estimated population of 4,050. The Holland treatment plant and well field has been upgraded recently, but distribution improvements are still needed to meet current demand. Longer-term improvements such as the Lewis and Clark Rural Water System are needed to meet the needs for expanded service

in this service area. Protection and improvement of our water supplies is an on-going process, and a top LPRW priority. LPRW is working with water systems in southwest Minnesota and neighboring states to develop the water resources we need now and in the future. For more information on Lincoln-Pipestone Rural Water, contact the following:

Lake Benton, Minnesota 56149-0188
East Highway 14, Box 188
Phone: (507) 368-4248
Fax: (507) 368-4573
<http://www.lprw.com/>

Groundwater Protection Profile and Assessment Summary

The **Regional Hydrologic Assessment** provides a vast amount of geologic and water-related information that should be used to help guide day-to-day land use planning. The problem, however, is interpreting the right information so that it can be used. According to Plate 4, the groundwater pollution sensitivity levels near Canby are very high and also are major concerns near the Cities of Hanley Falls, Granite Falls and Wood Lake. The County's Water Plan Committee recognizes the potential of using the regional assessment and, as a result, created an action step geared towards learning how to use the resource.

The **County Well Index** revealed that it has potential in being a valuable asset once the database becomes more complete. Map 2 reveals that many individual wells are located next to potential contamination sources. The type of database could be expanded to eventually include information on site visits designed to inspect the safety of each well. The index could also be used as a means to customize future programs aimed at addressing private well protection.

The larger category of **Source Water Protection** is one of the Minnesota Department of Health's main responsibilities. According to the efforts described on their website, **Wellhead Protection Plans** will eventually be designed for all **Public Water Suppliers**. In the interim, the information presented in this section (along with the corresponding website) may help in prioritizing wellhead protection on a local level. The Water Plan Committee recognizes the importance of Wellhead Protection and has committed to a number of action steps found in Chapter Two. These efforts include participating on source water protection planning teams, prioritizing Wellhead Protection Areas for cost-share and other land use incentive programs, and providing a variety of education on both wellhead protection areas and private well protection areas.

The other major part of the County's groundwater protection issue continues to be stressing the importance of properly sealing **Abandoned Wells**. This includes both an education component along with providing cost-share money to seal up to 20 wells annually.

EROSION AND SEDIMENT CONTROL PRIORITY ISSUE

Yellow Medicine County's Soils

The Soil Survey Geographic (SSURGO) database for Yellow Medicine County was developed by soil scientists as part of the National Cooperative Soil Survey. SSURGO depicts information about the kinds and distribution of soils on the landscape. This data set consists of georeferenced digital map data and computerized attribute data. The map data are in a soil survey area extent format and include a detailed, field verified inventory of soils and miscellaneous areas that normally occur in a repeatable pattern on the landscape and that can be cartographically shown at the scale mapped. This layer displays the location of features too small to delineate at the mapping scale, but they are large enough and contrasting enough to significantly influence use and management. The soil map units are linked to attributes in the National Soil Information System relational database, which gives the proportionate extent of the component soils and their properties.

Soils in Yellow Medicine County are generally clay and sand with rock a major characteristic in the northeast portion along the Minnesota River and above Granite Falls. The following is a brief description of the ten general soil associations occurring within the County:

Barnes-Buse-Flom - The Barnes soils are well drained. They are mainly undulating but are steeper near the Buse Soils. The Buse soils are well drained, calcareous, and mainly rolling to very steep. They are closely intermingled with Barnes soils, except in steeper areas. The Flom soils are nearly level and poorly drained. They are in shallow drainage ways on wet flat areas.

Forman-Flom-Aastad - The Forman soils are on the convex parts of the Coteau slope and are adjacent to the steep side slopes along drainage ways. They are well drained and are mainly undulating, but are steeper near the Buse soils. The Flom soils are in the shallow drainage ways. They are nearly level and poorly drained. The Aastad soils formed in plane and slightly convex parts of the Coteau slope. They are nearly level and moderately well drained.

Ves-Canisteo - The Ves soils are well drained and are on convex knolls that rise 4 to 10 feet above the floor of the till plain. The Canisteo soils are poorly drained and calcareous. They are in float areas and on rims of depressions.

Ves-Canisteo-Spicer - The Ves soils are well drained and are on convex knolls. The Canisteo soils are poorly drained and calcareous. They formed in a 20 to 40 inch thick mantle of silty lake-deposited sediment that overlies the loam glacial till. The Spicer soils are poorly drained and calcareous. They formed in a mantle of silty, lake-deposited sediment about 40 to 80 inches thick.

Doland-Spicer - The Doland soils are on the smooth side slopes and are well drained. The surface soil is black and very dark gray silt loam about 11 inches thick. The Spicer soils are in the drainage ways and poorly drained and calcareous. The surface soil is black and very dark gray silty clay loam and silt loam about 22 inches thick.

Burr-Du Page-McIntosh Variant - The Burr soils are on the flat and slightly concave parts of the lake plain. They are poorly drained calcareous, and have a high content of gypsum. The Du Page soils generally are next to the streams that cross the lake plain but at a slightly higher elevation. They are moderately well drained and calcareous. The McIntosh Variant soils are on plane and slightly convex areas that are 1 foot to 3 feet above areas of Burr soils. They are calcareous and somewhat poorly drained.

Calco-Du Page - The Calco soils are typically on the lower levels of the flood plain. These poorly drained, calcareous soils formed in silty material deposited by floodwaters. The Du Page soils are on the slightly higher levels of the flood plain. They are deep and moderately well drained.

Arvilla-Egeland - The Arvilla soils are somewhat excessively drained. They are dominantly nearly level, but a few areas are gently sloping. The Egeland soils are well drained. These soils are in nearly level swales and on gently sloping side slopes.

Terril-Storden-Swan Lake - The Terril soils are on foot slopes, in slump areas on the back parts of side slopes, and in drainage ways that dissect the side slopes. These soils are moderately well drained and noncalcareous. The Storden soils are on steep and very steep convex side slopes that support prairie vegetation. These soils are well drained and calcareous. The Swan lake soils are on steep and very steep convex side slopes that are covered by forest vegetation. These soils are well drained and calcareous.

Copaston-Rock Outcrop - The Copaston soils are well drained and are undulating to steep. The Rock, outcrop part of the unit is Precambrian igneous rock. It is mostly gneiss.

Yellow Medicine Soil and Water Conservation District

The Yellow Medicine County Soil Conservation District was duly organized as a government subdivision of this State, and a public body corporate and politic on the 17th day of April 1950. On February 5, 1963, the district name was officially changed to the Yellow Medicine Soil and Water Conservation District (SWCD). The mission of the Yellow Medicine SWCD is to provide technical, financial, and educational support for the purpose of conserving and/or protecting soil, water and other county resources.

Wind Erosion

Wind erosion is the process of separation and sedimentation of soil material by wind action. It occurs in all parts of the County and is a cause of serious soil deterioration. The basic causes of wind erosion are wherever the soil is overly loose and dry, the surface is smooth, dry and without debris, and the wind is strong without resistance.

In the County, wind erosion has caused high amounts of topsoil loss due to high winds. These losses range from 0 to 12 tons per acre. Potential for severe wind erosion occurs on approximately 25% of the cropland, 110,000 acres. The remaining cropland has a slight to moderate erosion problem. Damage has occurred due to the intensified heat of strong southerly winds. Many streams and roadside ditches have become increasing subject to sedimentation due to soil movement in the wind. Productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer.

Water Erosion

Water erosion is the disturbance of soil from its original position by water movement. Water erosion in the County can be classified as sheet erosion, rill erosion, and gully erosion and stream bank erosion. Sheet erosion is the removal of thin layers of soil by water over the entire surface. Rill erosion or rills are small channels caused by running water, and can be removed by normal cultivation operations. Gully erosion is caused the same as rill erosion only on a larger scale, too large to be removed by ordinary tillage. Stream bank erosion occurs along the banks of streams during and in between rainstorms, but primarily during peak flood stages.

Water erosion in the County ranges from 0 to 20 tons per acre. 50% of the cropland, 205,000 acres, has soils subject to excessive erosion. Many areas in the County are considered critical water erosion areas because of steep slopes and slow water permeability. Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layers are lost and part of the subsoil is incorporated into the plow layer. Second, soil erosion on farmland results in sediment entering streams.

Tillage Transect Survey – Yellow Medicine County

The cropland roadside transect survey method is designed to gather information on tillage and crop residue management systems by rating the percentage of cropland meeting residue targets. Conservation tillage is an indicator of environmentally friendly systems being used on cropland and is a component of the Natural Resource Conservation Service (NRCS) Performance Reporting Management System (PRMS). One of the NRCS strategic goals is to have 50% of the cropland managed to enhance soil quality. The following data display's Yellow Medicine County's transect survey results from 2000 to 2002.

Residue Trend Analysis
Percent of Corn and Soybean Fields meeting residue targets

2000	2001	2002
26%	48%	40%

The above information documents the last three years of published information available for Yellow Medicine County. It reflects the percent of corn and soybean fields in the county that meet residue targets for conservation tillage. Data documents that the three-year average reflects 38% of the fields meeting residue targets.

Wind and Water Erosion Definitions

The Yellow Medicine SWCD was heavily involved throughout the water planning process. As a result, two erosions maps were created showing wind and water erosion-prone soils. These maps were created using USGS’s Soil Viewer Extension. Although the maps should not be used for site planning, they provide a general view of the extent that wind and water erosion plays in Yellow Medicine County.

For administration of the State Cost-Share Program by the Yellow Medicine Soil and Water Conservation District the following definitions apply:

High Priority Erosion Problems – “High priority erosion problems” means areas where erosion from wind or water is occurring equal to, or in excess of, 2 x T tons per acre per year or is occurring on any area that exhibits active gully erosion or is identified as high priority in the comprehensive local water plan or the conservation district’s comprehensive plan.

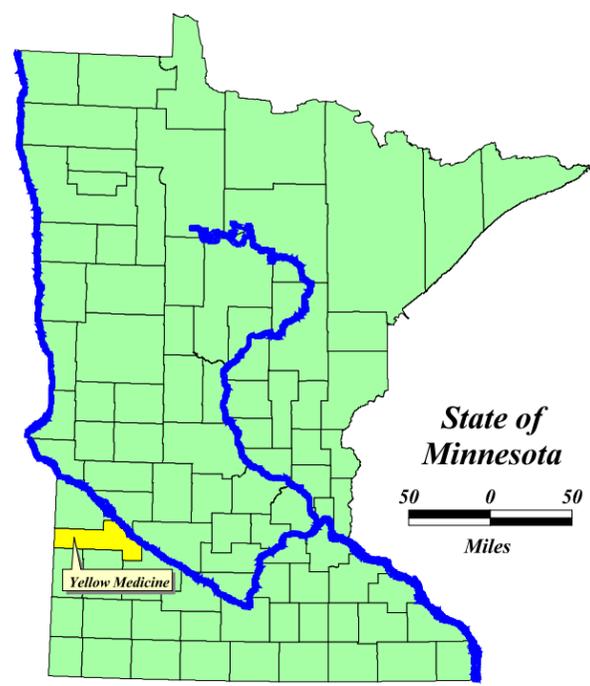
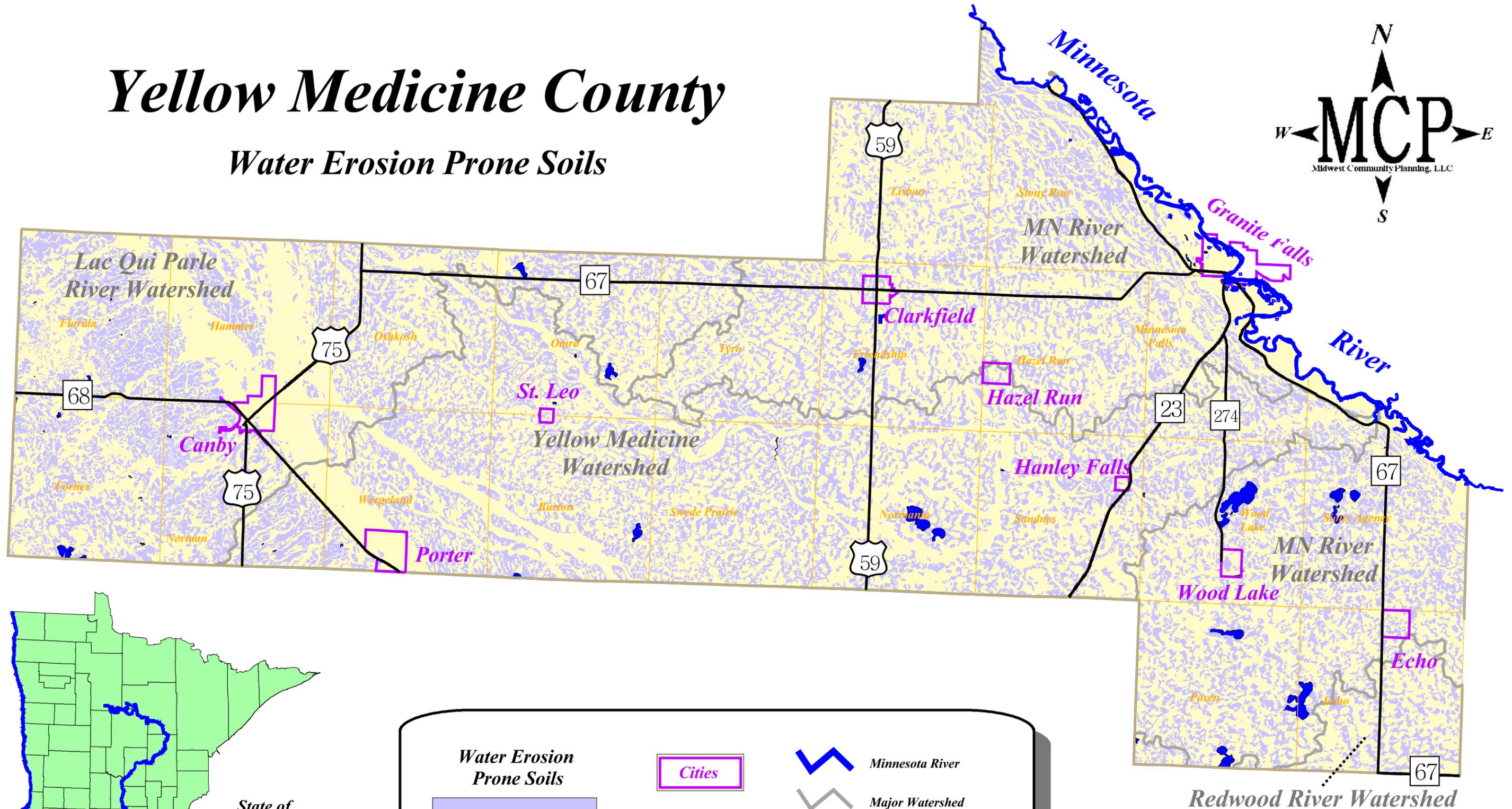
High Priority Water Quality Problems – “High priority water quality problems” means areas where sediment, nutrients, chemicals, or other pollutants discharge to Department of Natural Resources designated protected waters or to any high priority waters as identified in a comprehensive local water plan or the conservation district’s comprehensive plan, or discharge to a sinkhole or groundwater. The pollutant delivery rate to the water source is in amounts that will impair the quality or usefulness of the water resource.

Yellow Medicine County Riparian Land use

It is estimated that Yellow Medicine County has 58,084 acres in the riparian zone (For this discussion the riparian zone is defined as the 100-year floodplain or a 100-foot wide riparian zone along linear water features and/or lakes within the County). Of these total acres - it is estimated that 39,068 acres are cultivated. From current Yellow Medicine County enrollment data in CRP, CREP, RIM, WRP, etc. – we estimate that 9100 acres are located in a riparian area. Thus approximately 23 percent of the 100 year floodplain / 100 foot riparian zone is currently protected in Yellow Medicine County.

Yellow Medicine County

Water Erosion Prone Soils



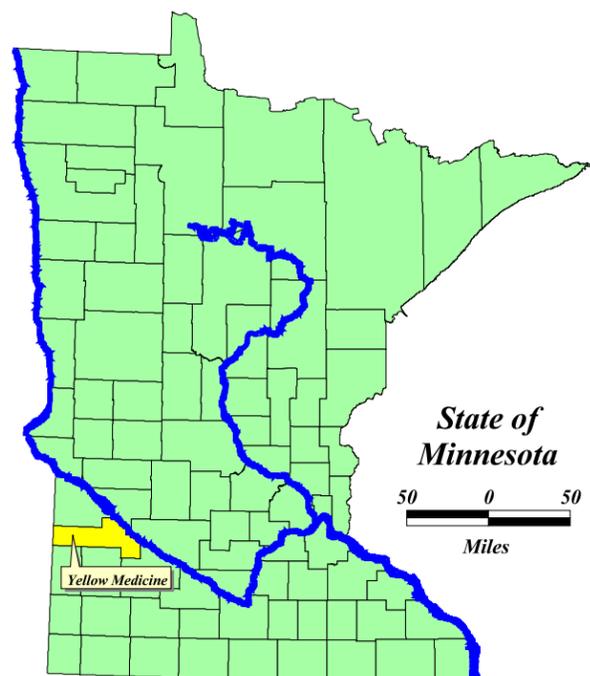
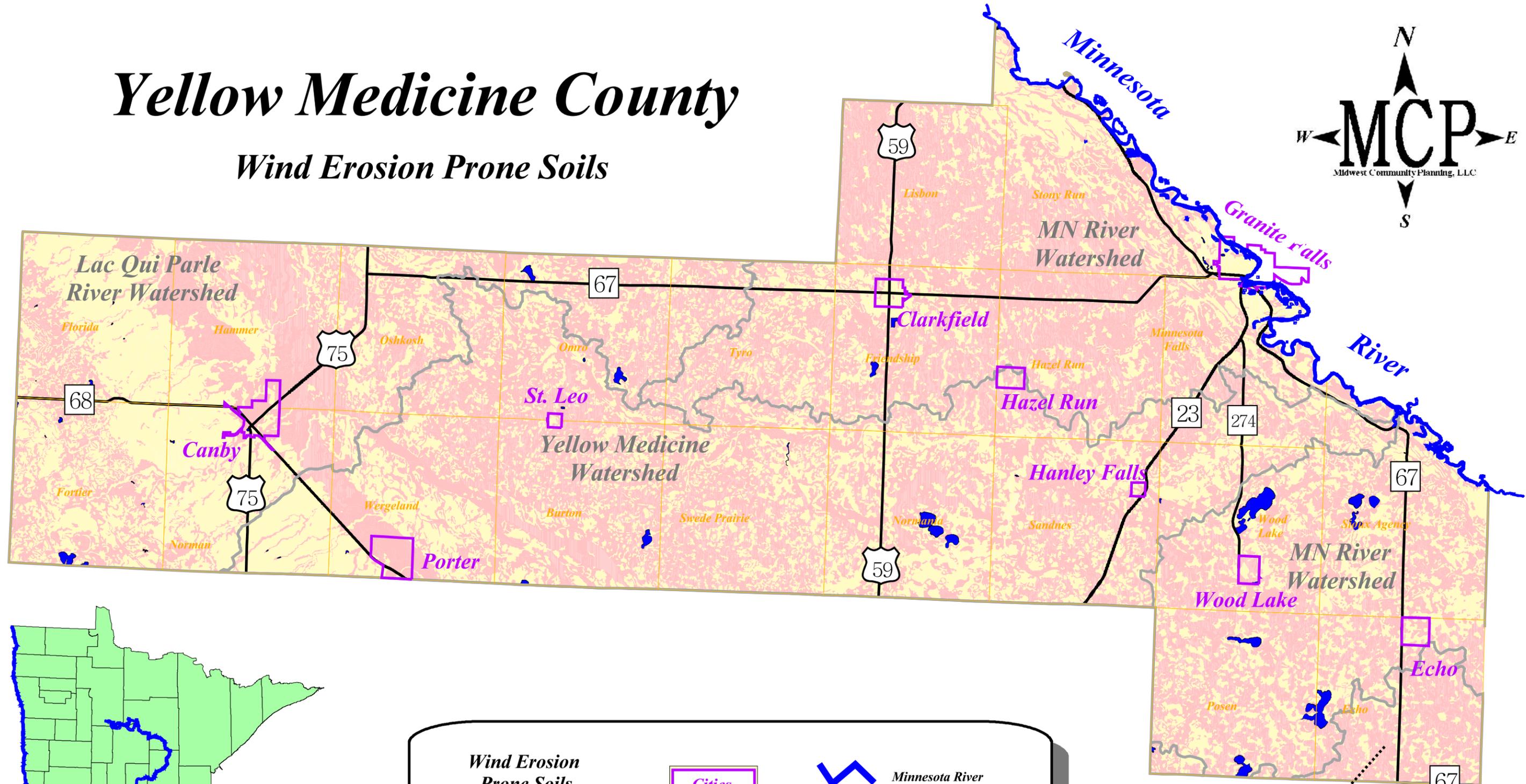
Water Erosion Prone Soils	Cities	Minnesota River
	Townships	Major Watershed
Not Water Erosion Prone		Major Road

5 0 5 Miles

Disclaimer: This map was created by using USGS's Soil Viewer Extension and information provided by Yellow Medicine County.

Yellow Medicine County

Wind Erosion Prone Soils



Wind Erosion Prone Soils	Cities	Minnesota River
		Major Watershed
Not Wind Erosion Prone	Townships	Major Road

5 0 5 Miles

Redwood River Watershed

Disclaimer: This map was created by using USGS's Soil Viewer Extension. All soils with a Wind Erodibility Index of 86 or higher were selected.

EROSION AND SEDIMENT CONTROL ASSESSMENT SUMMARY

Wind erosion can occur in most parts of the County but is greater in the Canby area and also on the lighter soils. Wind erosion is a high priority concern in Yellow Medicine County because it has already caused high amounts of topsoil loss. These losses range up to 12 tons per acre. The potential for severe wind erosion occurs on approximately 25% of the cropland, or 110,000 acres. The remaining cropland has slight to moderate erosion problems.

Water erosion in the County ranges up to 20 tons per acre. Up to 50% of the cropland, or over 200,000 acres, has been subject to extensive erosion. Many areas in the County are considered critical water erosion areas because of steep slopes and slow water permeability. Heavy rain and spring runoff on the steeper slopes in the Canby area, Stony Run Township and Sioux Agency Township have the most critical water erosion.

Sedimentation occurs in all County lakes, streams, rivers and ditches, however, the problem is the most severe in the downstream portion of the Yellow Medicine River and in streams in the western portion of the County. Damages associated with soil erosion include increased downstream flood damages and sediment damages to roads, drainage ditches and fish and wildlife habitat. Water quality in streams and lakes is reduced from sediment, plant nutrients, fertilizer and other chemicals contained in the runoff. The Natural Resource Conservation Service estimates 58,000 tons of sediment and other pollutants are delivered to the Minnesota River annually from the Yellow Medicine River. The potential for critical sedimentation problems in Yellow Medicine County occurs on approximately 6,280 acres.

REDUCING PRIORITY POLLUTANTS PRIORITY ISSUE

Feedlots

An adequate supply of healthy livestock, poultry and other animals is essential to the well-being of Yellow Medicine County's citizens. These domesticated animals provide people's daily source of meat, milk, eggs and fiber. Their efficient, economic production must be the concern of all consumers if we are to have a continued abundance of high-quality, wholesome food and fiber at reasonable prices. Livestock, poultry, and other animals produce manure, however, which may negatively affect Yellow Medicine County's environment. This only occurs when the manure is improperly stored, transferred or disposed.

As a result, Yellow Medicine County enforces an Animal Feedlot Ordinance, which requires a permit for the operation of any feedlot in the County. The basic premise of the Ordinance is to require setbacks between feedlots and incompatible land uses (i.e., residences, parks, drainage ditches, etc.).

State Feedlot Regulations

The Minnesota Pollution Control Agency (MPCA) regulates and controls pollution created by animal feedlots. The MPCA's feedlot rules were first adopted in 1971 and amended in 1974, 1978 and 2000. The trend in agriculture has been toward fewer but larger livestock and poultry facilities. There has also been a trend of increasing awareness about the potential environmental effects of feedlots. In accordance with MPCA feedlot regulations, the owner(s) of an animal feedlot or manure storage area with 50 or more animal units, or 10 or more animal units if in shore land (less than 300 feet from a stream or river, less than 1,000 feet from a lake) needed to register with the MPCA by January 1, 2002. Registration was accomplished one of three ways: 1) the owner(s) can fill out information on an MPCA registration form and return it to the MPCA or, in a delegated county, the delegated county feedlot officer, 2) the owner(s) can fill out a permit application (if required to obtain a permit), or 3) the owner can be listed on a current (as of October 1, 1997) Level Two or Level Three inventory that also contains the required information and the inventory has been submitted to the MPCA, this serves as fulfilling the initial registration requirement. It is the owner's responsibility to ensure that his or her registration information has been forwarded to the MPCA.

Definition of an Animal Unit:

A standardized measure to compare differences in the production of animal manure for an animal feedlot or manure storage area. A mature cow of about 1000 pounds (455 kg.) is the standard unit, thus being 1 animal unit. In comparison, it takes approximately 2.5 adult hogs to equal a 1000 pound cow. As a result, each adult hog is equal to a 0.4 animal unit. In other words, it takes 2.5 hogs to equal 1 animal unit.

Registration information must be updated at least once in every four-year period after January 1, 2002. The MPCA or delegated county will notify owners that they must re-register at least 90 days before their current registration expires. Also, the MPCA or delegated county will send the owner a receipt within 30 days of receiving the registration information from the owner.

Exemptions to registration:

- Owners of livestock facilities located on county fairgrounds were not required to register.
- Owners of pasture or grazing operations that have buildings or lots with a capacity of less than 50 animal units, or less than 10 animal units in shore land areas, were not required to register.
- Owners of pasture or grazing operations that do not have buildings or open lots were not required to register.

Once registered, owners will be directed to obtain any needed permits. The requirement for a feedlot permit is dependant upon the size of the operation and whether or not a pollution

hazard has been identified. Owners with less than 300 animal units are not required to have a permit for the construction of a new facility or expansion of an existing facility if construction is in accordance with the technical standards contained in Minnesota State Rules. For owners with 300 animal units or more, but less than 1,000 animal units, a streamlined short-form permit is required for construction activities. An Interim Permit is required for owners with 300 animal units or more, but less than 1,000 animal units, if a pollution hazard has been identified. Finally, a National Pollutant Discharge Elimination System (NPDES) permit or State Disposal System (SDS) permit is required for all feedlots with 1,000 animal units or more. NPDES and SDS permits must be issued by the MPCA. All other permits are issued by the County.

Owners of feedlots with less than 300 animal units, with passive manure-contaminated runoff from open lots, are encouraged to sign up for the 2005/2010 Open-lot Agreement. If an owner qualifies for the agreement, they will be allowed to phase in any needed corrections to pollution problems. Owners are required to install clean-water diversions, vegetated buffer areas or filter strips for manure-contaminated runoff to flow through, or other corrective measures by October 1, 2005.

Yellow Medicine County's Feedlot Program

Yellow Medicine County has administered the feedlot program for the MPCA since 1982. The administration of the program is handled by the Zoning Administrator/Feedlot Officer. The feedlot permitting process begins when a landowner requests a feedlot permit application or when a building permit is received where the proposed construction is for a livestock facility. The landowner completes the application form and any other required

information. The application packet is reviewed by the feedlot officer. When all necessary information has been received and the Feedlot Officer determines that all MPCA regulations and local ordinance requirements have been met, the appropriate permit is issued. The Feedlot Officer inspects feedlots for potential pollution problems and educates producers about best management practices. On September 9, 1993, Yellow Medicine County adopted a Feedlot Ordinance which outlines the permitting requirements, setback requirements for new feedlots, animal waste utilization and manure spreading setbacks, and also defines when a conditional use permit or a variance is required. The Feedlot Ordinance was updated, revised and approved by the County Commissioners on September 22, 1998.

A Level Two Inventory of all feedlots in the County was completed in 2000. The Level Two Feedlot Inventory contains specific information, such as the number and type of livestock, type of manure storage and distance to surface water. The inventory identified 372 feedlots with ten or more animal units. The Feedlot Officer completes and submits to MPCA an annual report and work plan. The County participates in the Natural Resources Block Grant and receives funding from the State to administer the Chapter 7020 Rules regulating feedlots. The Water Plan Committee identified a few key action steps to address feedlot concerns, including the development of a GIS layer of feedlots registered under current MPCA registration guidelines.

Individual Sewage Treatment Systems (ISTSS)

Individual Sewage Treatment Systems (ISTSS) are used for the treatment and disposal of wastewater from individual homes, clusters of homes, isolated communities, industries or institutional facilities. When properly functioning, ISTSS are an effective means of treating wastewater. However, if improperly designed, installed or maintained, ISTSS have the potential to adversely impact water quality. Human waste contains high concentrations of microorganisms and many chemicals, including carbon, nitrogen, phosphorus and salts. These pollutants not only represent a public health concern, but also can significantly degrade the quality of the environment.

The first State law addressing failing ISTSS went into effect in 1994. This legislation is known as the ISTS Act (Minnesota Rules, Chapter 7080). Chapter 7080 requires that all new construction and replacement of ISTSS meet minimum statewide standards. It also puts into place a method to systematically address the adequacy of existing systems through requiring upgrading of failing existing systems before construction of an additional bedroom. The following are the State's objectives in regulating sewage systems through Chapter 7080:

- Keep inadequately treated sewage away from human contact to prevent disease;
- Reduce levels of pathogenic bacteria and viruses discharged to the environment;
- Reasonably and cost-effectively prevent ground-water contamination;
- Develop clear direction for design, construction and maintenance of sewage-treatment facilities;
- Strive for cost-effective methods of sewage treatment to maintain or improve property values;
- Encourage personal responsibility for treating sewage; and
- Require all counties to adopt an ISTS ordinance.

TMDLs

The Clean Water Act requires states to publish, every two years, an updated list of streams and lakes that are not meeting their designated uses because of excess pollutants. The list, known as the 303(d) list, is based on violations of water quality standards and is organized by river basin. To facilitate this process, Total Maximum Daily Loads (TMDLs) were designed for a number of priority pollutants. These standards define how much of a pollutant can be in a surface and/or ground water while still allowing it to meet its designated uses, such as for drinking water, fishing, swimming, irrigation or industrial purposes.

For each pollutant that causes a water body to fail to meet state water quality standards, the federal Clean Water Act requires the MPCA to conduct a TMDL. A TMDL study identifies both point and nonpoint sources of each pollutant that fails to meet water quality standards. Water quality sampling and computer modeling determine how much each pollutant source must reduce its contribution to assure the water quality standard is met. Rivers and streams may have several TMDLs, each one potentially determining the limit for a different pollutant.

The current 303(d) TMDL listing was published in July 2004. Yellow Medicine County has four water bodies identified on the list. The following text box identifies these waters, along with when each was listed, the affected use, and the pollutant identified in the TMDL study.

**Table 2:
TMDL Listing for Yellow Medicine County
(July 2004)**

Reach	New or Previous Listing	Affected Use	Pollutant or Stressor
Del Clark Lake	New	Aquatic consumption	Mercury and Fecal Coliform
Yellow Medicine River	Previous Listing	Impaired River	Mercury and Turbidity
Lac qui Parle River	Previous Listing	Impaired River	Mercury
Minnesota River	Previous Listing	Impaired River	Mercury, PCBs, Turbidity and Fecal Coliform
Spring Creek	Previous Listing	Impaired River	Biota

For more information on TMDLs, please visit the following Minnesota Pollution Control Website:

<http://www.pca.state.mn.us/water/tmdl/index.html#finaltmdl>

Information from the Yellow Medicine River Watershed Clean Water Partnership Project – Phase I assessment and Phase II implementation plan:

The project area of concern is the Yellow Medicine River and the associated watershed. The watershed lies in the Northern Glaciated Plains ecoregion and has land use patterns typical for this ecoregion. Significant watershed, water monitoring data and resource characteristics are presented in the Greater Yellow Medicine River Diagnostic Study and Feasibility Report (Phase 1 Final Report) that is referenced here and provides important assessment and implementation direction for the Yellow Medicine County Water Plan.

Several studies have been conducted on the Yellow Medicine River in the past including: 1) USGS stream gauging and water quality investigations; 2) Area II flood routing modeling; 3) several flood control investigation and dam construction projects by the Yellow Medicine River Watershed District; 4) Minnesota State Comprehensive Soil Survey; 5) wetland and wildlife restorations by the Federal Fish and Wildlife Service and Duck's Unlimited Incorporated; 6) Minnesota Department of Natural Resources (DNR) fisheries surveys; and 7) land use and soil delineation and digitizing projects by Lincoln, Yellow Medicine and Lyon County SWCDs; 8) Clean Water Partnership Phase I Diagnostic Study. A major study of the Yellow Medicine sub-basin was conducted by the US Army Corps of Engineers and the US Soil Conservation Service under the authority of Public Law 87-639. These studies indicate the river has been subject to extreme water quality deterioration processes in the recent past related to severe flooding problems associated with local catchment loss and subsequent increasing downstream flooding problems. Crop loss due to flooding has particularly been the subject of growing debate. The average annual reduction in net income because of sheet, rill, and wind erosion on inadequately protected cropland amounts to \$3,450,000 on 231,300 acres. Future projections predict total average annual damages to be at \$599,410 in the Yellow Medicine sub-basin. Currently approximately 39,100 acres exceed twice the tolerable soil loss level.

Flooding, drainage, erosion, sedimentation, and poor water quality are among the foremost problems in this watershed. Water quality in the watershed's streams and lakes suffers from the sediment, nutrients, fertilizer, and chemicals in the runoff. The goal of the Yellow Medicine River Clean Water Partnership Project is to:

- Increase the implementation of best management practices for runoff;
- Reduce soil erosion;
- Improve water quality; and
- Reduce flooding.

With the development of the Phase II Implementation Plan sub watersheds were prioritized based on mass/unit area discharges of **total phosphorous, total suspended solids, and nitrate-nitrite nitrogen.**

The implementation plan highlights the prioritized sub watersheds for targeted controls. The plan promotes optimized fertilization practices and implements the most cost effective controls. The goals for the implementation plan were developed through the following steps:

- Implementation plan objectives – **the plan identifies a 25% reduction in total phosphorous (TP), total suspended solids (TSS), and nitrate-nitrite (NO23) at the priority sites based on the Phase I diagnostic study results;**
- Identification of priority management areas; and
- Best management Practice (BMP) alternatives and analysis.

Information from the Lac qui Parle – Yellow Bank Clean Water Partnership Project – Phase I assessment and 319 implementation project proposal

After a three-year diagnostic study, review of water quality data and input from watershed residents, three major water quality problems and priority areas were identified:

- Water quality throughout the watershed continues to be degraded by elevated levels of **fecal coliform bacteria** from both human and animal sources. All thirteen monitoring sites exceeded the fecal coliform bacteria standard (200 organisms per 100 milliliters of water) set by the Minnesota Pollution Control Agency numerous times. In addition to the possible health risk associated with the presence of elevated levels of fecal coliform bacteria, it can also be the cause of decreased water clarity, unpleasant odors, and an increased oxygen demand.
- **Elevated levels of total suspended solids and turbidity** on the Lac qui Parle River from Highway 68 to the Lac qui Parle Village is also contributing to water quality problems. A small amount of erosion per acre over a majority of the watershed's area can result in significant erosion and sedimentation problems. Sediment, nutrients, and chemicals carried into the surface water by eroded soils further degrade water resources.
- A final concern is the **high level of nitrate + nitrite nitrogen** in the Ten Mile Creek sub watershed (*note - this area of the watershed is not within Yellow Medicine County*). Excessive nitrogen can accelerate eutrophication, causing dramatic increase in aquatic plant growth and changes in the type of plants and animals that live in the water. It also will eventually affect dissolved oxygen, temperatures, and other indicators.

A recent application for 319 implementation funding will target acceleration of best management practices in the middle reach of the main stem Lac qui Parle River from near Canby to Dawson. This middle reach has concentrations of total suspended solids near the 75th percentile for minimally impacted streams in Minnesota Northern Glaciated Plains Ecoregions and turbidity levels over the 75th percentile. The turbidity standard is 25 NTUs. Exceeding this standard may subject this reach of the river to being listed on the 303(d) list that may require a total maximum daily load (tmdl) study in the future.

The Lower Lac qui Parle River from Dawson to Ten Mile Creek (*note – this area of the watershed is not within Yellow Medicine County*) is already on the 303(d) 2004 Listing of Impaired Waters – for low oxygen levels. It is imperative to manage the water quality concerns in this watershed because they compound as the water flows downstream. This project is in the upper reaches of the Minnesota River watershed and as such impact the Lower Minnesota River Low Dissolved Oxygen TMDL. Finally, excessive levels of fecal coliform bacteria are throughout the entire Lac qui Parle – Yellow Bank Watershed. All thirteen monitoring sites exceeded the fecal coliform standard of 200 organisms per 100 ml., which will likely cause listing on the 303(d) list of impaired water requiring a TMDL study in the future.

REDUCING PRIORITY POLLUTANTS ASSESSMENT SUMMARY

Yellow Medicine County identified the priority of reducing priority pollutants related to feedlots and non-conforming individual sewage treatment systems during the County's water plan scoping process. These two issues were discussed throughout the planning process and third category, addressing the County's waters found on the Pollution Control Agency's TMDLs list, was also added as part of the County's overall priority issue.

The Feedlot section of this Chapter identified a number of statewide feedlot issues along with Yellow Medicine County's information. The primary feedlot-related implementation steps found in Chapter Two represent the continuation of the County's desire to proactively work with the Minnesota Pollution Control Agency on properly administering the County's Feedlot Program. This includes creating a GIS layer of the feedlots registered with the State and incorporating the database with MPCA's database. The additional key steps primarily involve assisting the County's feedlot operators with the various feedlot regulations.

Although this Chapter does not provide much information on the County's network of individual sewage treatment systems, properly administering the State's ISTS regulations remains a major component in the County's overall water plan. This is because of the direct relationship between failing treatment systems and water quality. Due to this relationship, the County identified assisting with 50 ISTS upgrades per year as one of the action steps found in Chapter Two. This would primarily be achieved by seeking funding and offering landowners low interest loans. In addition, the County committed to creating a GIS layer of all the septic systems in the County. Much like a drainage inventory, having a good database is often the first step to good program management.

The County's waters found on the 303d list of impaired waters became an increasingly important water planning issue as the water planning process progressed. This is primarily because of the emphasis the Minnesota Pollution Control Agency has placed on working with local water planning organizations during the TMDL plan development and implementation stages. Often the actions steps found in a County's water plan collectively represent which direction the county needs to be moving to properly remove bodies of water off the TMDL designation. As a result, the county made a number of commitments in Chapter Two that will prioritize assisting throughout the TMDL process. In short, removing Del Clark Lake, the Minnesota River, the Yellow Medicine River, the Lac qui Parle River, and Spring Creek off the 303d list of impaired waters would be a major accomplishment for the County's water planning efforts.

MANAGING FLOODING PRIORITY ISSUE

Flooding in Yellow Medicine County occurs primarily in the spring during periods of peak conditions (rainfall and snowmelt) and in areas where the soil has low permeability qualities. Damages are mainly confined to the Yellow Medicine and Lac qui Parle watersheds. Some loss of topsoil occurs during these events with major damages resulting in drowned crops and a loss of nutrients from within the soil. This results in decreased crop yields, increased herbicide and tillage costs and increased fertilizer costs. Flooding damages also include channel erosion problems and sedimentation. The drainage of wetlands with the resulting loss of natural flood water storage has increased the severity of cross-over flooding.

According to estimates by the Army Corps of Engineers and the Natural Resource Conservation Service, there are approximately 27,657 acres in the 100-year floodplain within the Lac qui Parle and Yellow Medicine watersheds (See Map 5). Within the Lac Qui Parle watershed, average annual damages resulting from flooding amount to about \$390,030. In the Yellow Medicine River watershed annual damages amount to about \$471,080. Thus, total average annual flood damages in the two watersheds amounts to \$861,110. These figures were determined using 1985 cost benefit figures. Therefore, the damage figures given are underestimated in today's economy.

Through a combination of federal, state and local efforts several floodwater retarding structures have been constructed to reduce flooding and associated damages in the Yellow Medicine basin. An important secondary benefit of these structures is sedimentation control (although sometimes they can actually be the cause of additional erosion downstream). One of these structures is located west of Porter on a tributary of Mud Creek; two reservoirs have been constructed on tributaries in Lincoln County and one is located in Lyon County. Another reservoir, about six miles southwest of Canby on Lazarus Creek, should be completed in early 2005. In addition, Yellow Medicine County has constructed its first flood retention structure (downsized culvert) in 1994 located one mile northwest of Porter. This technology reverses the trend of replacing culverts with larger sized culverts which only transfers additional water downstream. Although this is only the first road retention project within Yellow Medicine County at present, Area II continues to promote this form of flood damage reduction for all member counties.

In addition, a large reservoir (Del Clark Lake) has been constructed on Canby Creek to reduce flood damages in the Lac qui Parle watershed. A number of other reservoirs in both the Lac qui Parle and Yellow Medicine sub basins were identified and studied as part of the P.L. 87-639 Study.

In 1993, Yellow Medicine County cooperated with Lincoln County in the construction of a flood control retention structure on Lincoln County Road #19. This structure will significantly reduce the amount of flooding in Yellow Medicine County. Yellow Medicine County will continue to explore the possibilities of cooperative flood control projects with neighboring counties. Especially with this county's narrow width, the potential exists to cost-share road retention projects with Lincoln and Lac qui Parle counties when benefits

extend downstream. Area II encourages this watershed-based approach where the most flood damage reduction benefit is gained, costs are shared, and peak flows are reduced.

- ✓ In 1997, Area II worked in cooperation with the County's Highway Department on the Fortier 15 Road Retention project. This project consisted of downsizing a culvert.
- ✓ In 1999, in cooperation with the Lac qui Parle – Yellow Bank Watershed District, Area II worked to restore the Fortier 8 dam to its original condition.
- ✓ In 2001, in cooperation with the Lac qui Parle – Yellow Bank Watershed District, Area II constructed a small dam ('Norman 16') and created a wetland measuring 1.62 acres.
- ✓ In 2002, in cooperation with the SWCD, Normania Township and the Watershed District, Area II designed a stream bank stabilization along 550' feet to redirect the Yellow Medicine River away from a township road.

Floodplain Ordinance

The Floodplain Ordinance was updated in 1993 and is being adequately enforced. The purpose of the Floodplain Ordinance is to promote the public health, safety, and general welfare and to minimize, within the flood hazard areas, the potential loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures or flood protection and relief, and impairment of the tax base. The Ordinance applies to all lands within the jurisdiction of Yellow Medicine County shown on the Official Zoning Map.

Federal Emergency Management Agency Maps

The Digital Flood Insurance Rate Map (DFIRM) Database depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance flood event, the 0.2-percent-annual-chance flood event, and areas of minimal flood risk. The DFIRM Database is derived from Flood Insurance Studies (FISs), previously published Flood Insurance Rate Maps (FIRMs), flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available. The FISs and FIRMs are published by the Federal Emergency Management Agency (FEMA). The file is georeferenced to earth's surface using the UTM projection and coordinate system. The specifications for the horizontal control of DFIRM data files are consistent with those required for mapping at a scale of 1:12,000.

The FIRM is the basis for floodplain management, mitigation, and insurance activities for the National Flood Insurance Program (NFIP). Insurance applications include enforcement of the mandatory purchase requirement of the Flood Disaster Protection Act, which "... requires the purchase of flood insurance by property owners who are being assisted by Federal programs or by Federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land facilities located or to be located in identified areas

having special flood hazards," Section 2 (b) (4) of the Flood Disaster Protection Act of 1973. In addition to the identification of Special Flood Hazard Areas (SFHAs), the risk zones shown on the FIRMs are the basis for the establishment of premium rates for flood coverage offered through the NFIP. The DFIRM Database presents the flood risk information depicted on the FIRM in a digital format suitable for use in electronic mapping applications. The DFIRM database is a subset of the Digital FIS database that serves to archive the information collected during the FIS.

The enclosed Yellow Medicine County Floodplain Map was recreated using FEMA's preliminary 2004 FIRM release. The information presented in the map is not official and should not be used to site planning purposes. The final Yellow Medicine County FIRM map will be adopted sometime in either 2005 or 2006.

MANAGE FLOODING ASSESSMENT SUMMARY

The County's priority issue of "manage flooding and its' effects minimizing the losses associated with the flooding of agricultural lands," highlights the county's main emphasize of being kind to its agricultural community. This is similar to the approach taken by many rural counties in Minnesota. As a result, today's water management strategies often look for "win-win" situations where landowners are willing to participate in the variety of programs that assist with establishing both temporary and permanent upland water storage.

The water plan committee recognized this by creating action steps aimed at maximizing existing programs such as CRP, RIM, WRP, and applying other best management practices to remove flood prone land out of crop production. The additional action steps focus on working with FEMA on sound floodplain management.

SURFACE WATER AND DRAINAGE MANAGEMENT PRIORITY ISSUE

Yellow Medicine County has extensive, well-developed artificial drainage systems that allow modern farming practices to occur. As previously noted, only about forty percent of the County was used for row crop production in 1950, whereas today about seventy percent of the land produces row crops. This transformation in land use was accomplished primarily through drainage of naturally wet soils.

In Yellow Medicine County there are approximately 250 miles of public drainage ditch along with an undetermined number of private ditches and tile lines. It is estimated that only seven miles of the public systems are subject to the M.S. 106A provision requiring permanent vegetation sixteen and one-half feet in width on both ditch banks. It is also estimated that of these seven miles requiring a buffer strip only four currently have the

required width of vegetation and then only on one side of the ditch. Drainage activities within the County are subject to the drainage law which establishes environmental and land use criteria for proposed drainage systems (106A.015). Before establishing a drainage project the drainage authority, county or watershed district, and the Natural Resource Conservation Service, must consider: (1) private and public benefits and costs of the proposed drainage project; (2) the present and anticipated agricultural land acreage availability and use in the drainage project or system; (3) the present and anticipated land use within the drainage project or system; (4) flooding characteristics of property in the drainage project or system and downstream for 5, 10, 25, and 50-year flood events; (5) the waters to be drained and alternative measures to conserve, allocate, and use the waters including storage and retention of drainage waters; (6) the effect on water quality of constructing the proposed drainage project; (7) fish and wildlife resources affected by the proposed drainage project; (8) shallow ground water availability, distribution, and use in the drainage project or system; and (9) the overall environmental impact of all the above criteria.

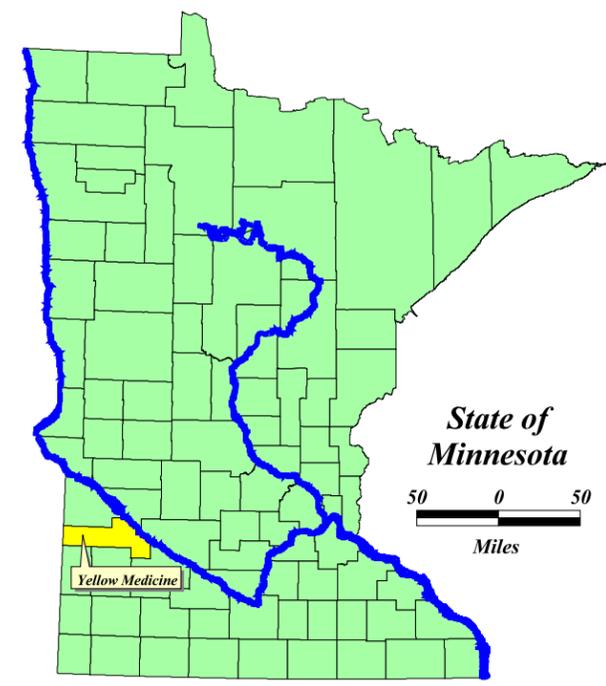
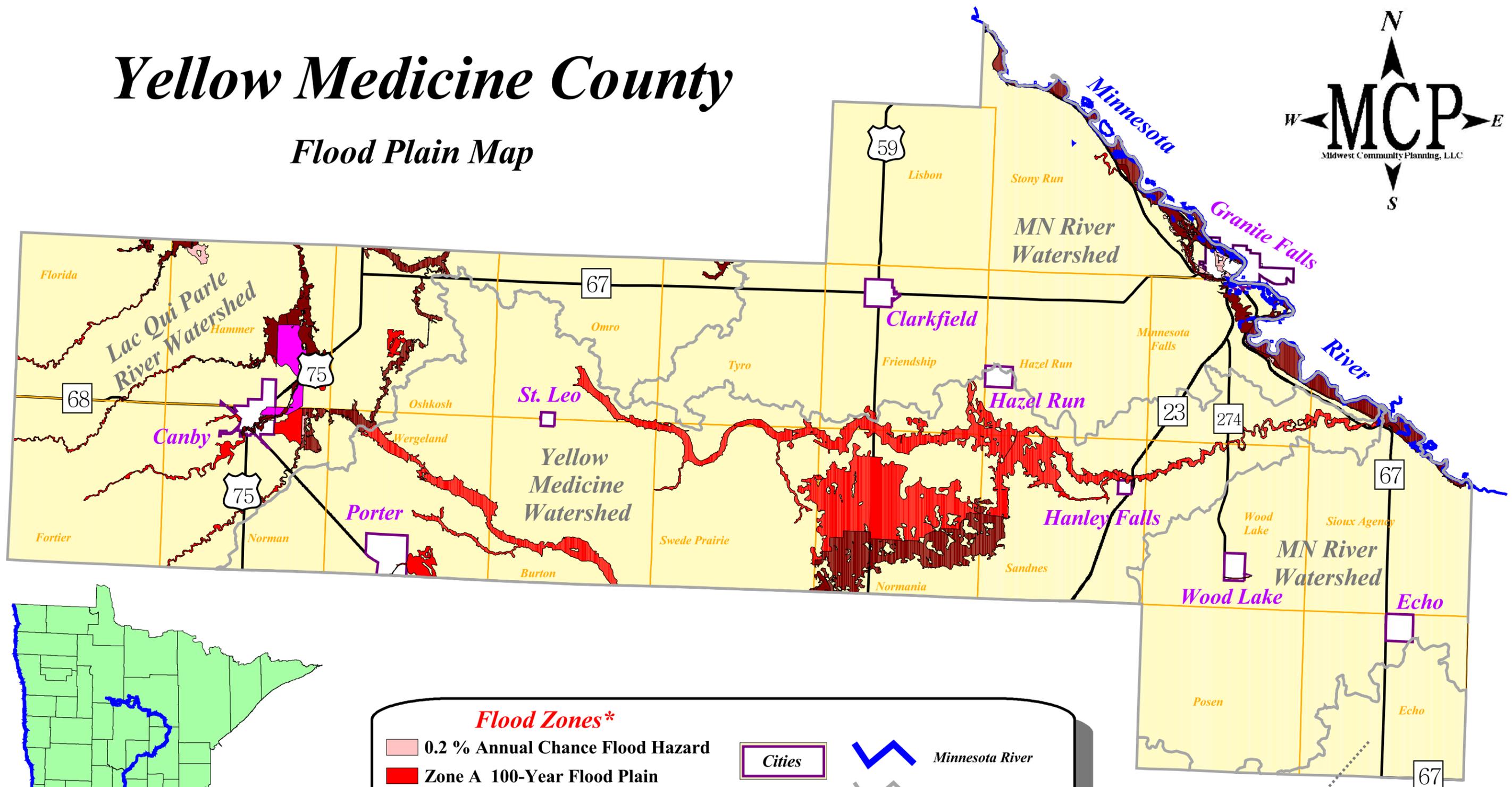
It is suspected that flooding in the County, particularly in the Yellow Medicine basin, has intensified as a result of drainage system expansions in recent years. There are no available data to substantiate this contention, but findings of the P.L. 87-639 study suggest a positive correlation between wetland drainage and increased flood damages. It is suggested that wetland conversion has increased the effective drainage area and thereby increased peak stream flows. The study does not, however, give any indications of the effect of routine ditch maintenance or installation of tile systems to improve previously drained land. Additionally, sediment loadings in County and regional streams have been aggravated by agricultural practices that have converted prairie sod and steeply sloping marginal land into crop production.

Current regulations affecting drainage of existing wetlands include the "swampbuster" provision of the 1995 Food Security Act (1990 Farm Bill) and the 404 permit program (Section 404 of the Clean Water Act) administered by the U.S. Army Corps of Engineers. Both of these programs have generated controversy and created confusion in the public's mind over what constitutes permissible drainage activities. The net effect of the programs, however, has been a substantial, though not complete, reduction in loss of wetlands. It is anticipated that as ambiguities in the 404 program are removed conflicts surrounding wetland alterations will be reduced.

Essentially, the 404 program regulates the discharge of dredged or fill material into waters of the United States. Projects involving these types of activities require a permit that will only be issued in cases found to be in the public interest. Activities that are not "water dependent" (e.g., channel improvements) are discouraged by the regulations; and, in most instances, the applicant for a permit must demonstrate there are no practical alternatives to the proposed project. If the applicant chooses to proceed with a project without securing a permit, mitigation is required to offset adverse effects of the project. This occurs through creation or enhancement of waters of the United States thereby avoiding an overall loss of environmental values.

Yellow Medicine County

Flood Plain Map



Flood Zones*

- 0.2 % Annual Chance Flood Hazard
- Zone A 100-Year Flood Plain
- Zone AE 100-Year Flood Plain
- Zone AO 100-Year Flood Plain
- Zone X - Outside the Flood Plain

Legend:

- Cities
- Townships
- Minnesota River
- Major Watershed
- Major Road

5 0 5 Miles

**Please refer to the text for zone definitions*

Disclaimer: This map was created by using information provided by the Federal Emergency Management Agency (FEMA). This is not an official Yellow Medicine County Flood Plain Map.

In 1991, the Minnesota Legislature approved the Wetland Conservation Act (WCA) to promote the no-net loss of wetlands and to protect the benefits wetlands provide. The Act moves towards its no-net loss goal by requiring persons proposing to drain or fill a wetland to: first, try to avoid disturbing the wetland; second, try to minimize any impact on the wetland; and finally, to replace any lost wetland functions and values. The law also contains a list of certain activities that qualify for an exemption under this act. Yellow Medicine County delegated the responsibility of administering this act to the Yellow Medicine Soil and Water Conservation District.

SURFACE WATER AND DRAINAGE MANAGEMENT ASSESSMENT SUMMARY

One of the best ways to manage water on the land is through wetland restoration and the promotion and implementation of land retirement programs. Drainage has changed the hydrology of our watersheds: more than 90% of the original wetlands in the Minnesota River Watershed have been drained or filled. Restoration of wetlands and changes in land use practices can work in concert to provide a way of keeping the water in place, reducing peak run off events, recharging groundwater aquifers, slowing the movement of surface water, providing habitat, and trapping nutrients and sediment.

According to the U.S. Farm Service Agency and Yellow Medicine Soil and Water Conservation District records, there have been approximately 2,500 acres of wetlands restored in Yellow Medicine County over the last 15 years. These were completed through the various State and Federal wetland restoration programs, offering ‘win-win’ opportunities for willing landowners in the past and should be pursued for willing landowners in the future.

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Chapter Two: Goals, Objectives and Action Steps

This Chapter establishes Yellow Medicine County’s Goals, Objectives and Action Steps for each of the County’s high priority issues. In review, the County’s five priority issues are:

- ✓ *Groundwater Protection*
- ✓ *Erosion and Sediment Control*
- ✓ *Reducing Priority Pollutants*
- ✓ *Managing Flooding*
- ✓ *Surface Water and Drainage Management*

Chapter Definitions

Each of the action steps contained in this Chapter identifies who is responsible for its implementation, when the action step should occur, and an estimate on how much it will cost. For the purposes of this Chapter, the following abbreviations are used (**An *Asterisk, Underlined, and Bold means lead action step responsibility**):

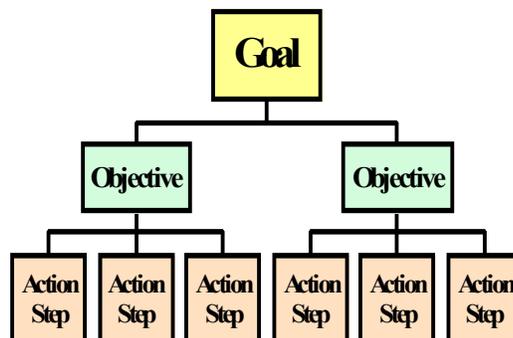
- | | |
|--|--|
| CB = County Board | USACE = U.S. Army Corps of Engineers |
| PC = County Planning Commission | BWSR = Board of Water & Soil Resources |
| PZ = County Planning & Zoning | DNR = Department of Natural Resources |
| DA = County Ditch Authority | FWS = U.S. Fish & Wildlife Service |
| HD = County Highway Department | MDA = Minnesota Department of Agriculture |
| YMR = Yellow Medicine River Watershed | MDH = Minnesota Department of Health |
| LqP = Lac qui Parle Watershed | MDOT = MN Department of Transportation |
| MGS = Minnesota Geological Survey | CPH = Countryside Public Health |
| SWCD = Soil and Water Conservation District | MPCA = Minnesota Pollution Control Agency |
| WPC = Water Planning Coordinator | UMES = University of MN Extension Service |
| NRCS = Natural Resources Conservation Service | |
| UMVRDC = Upper Minnesota Valley Regional Development Commission | |

Throughout the Comprehensive Water Plan, goals, objectives and action steps are defined in the following way:

Goal: A general, idealistic statement intended to be achieved at some undetermined future date.

Objective: Begin with an action verb and can be measurable if a date, dollar amount, etc. is included.

Action Step: Specific implementation steps that will be followed in order to achieve the County’s Goals and Objectives.



- Promote water conservation by using existing materials and resources (i.e., Minnesota Rural Water Association’s handouts).

Who: *WPC, SWCD **When:** 2005 – 2009 **Cost:** \$800

- Through an education campaign, identify steps in the demolition of vacant building sites so that all wells are sealed, underground storage tanks are removed, and hazardous waste is disposed of properly before demolition occurs.

Who: *WPC, PZ **When:** 2005 – 2009 **Cost:** \$500

- Continue to provide financial assistance as available to seal 20 abandoned wells per year.

Who: *WPC, PZ **When:** 2005 – 2009 **Cost:** \$5,000/yr.

**PRIORITY ISSUE #2:
EROSION AND SEDIMENT CONTROL**

Priority Concern:

“Erosion and sediment control on agricultural lands.”

EROSION AND SEDIMENT GOAL: *To PROTECT AND IMPROVE THE SOIL RESOURCES AND SURFACE WATER QUALITY IN THE COUNTY.*

Objective A: Reduce erosion and sediment problems to sustainable levels by promoting the use of Best Management Practices (BMPs).

- Plan BMPs for 20,000 cropland acres. Concentration will be on areas in the County that were designated as high priority areas. Such as:
 - Yellow Medicine Watershed, in particular portions of Sandnes, Norman, Wergeland, and a portion of the Yellow Medicine River, from Hanley Falls to the Minnesota River.
 - Lac qui Parle Watershed, in particular portions of Norman, Omro, Oshkosh, Tyro and Wergeland Townships.
 - Canby Creek Watershed, in particular above Del Clark Lake.
 - Above the structure on the Lazarus Creek Watershed.
 - Public Wellhead Protection Areas.
 - Main Channel of the Yellow Medicine River.
 - Land adjacent to the Lake of Wood Lake.

Who: *SWCD, PZ **When:** 2005 – 2009 **Cost:** \$20,000

2. Reduce the amount of wind erosion on the most severely erodible acres by designing and planting 50,000 feet of field windbreaks and/or living snowfences, 50 acres of farmstead windbreaks and 25 acres of wildlife habitat. Continue to promote the installation of plastic mulch for better weed control and/or soil moisture.

Who: *SWCD, MnDOT, HD **When:** 2005 – 2009 **Cost:** \$150,000

3. Conduct a Conservation Tillage Transect Survey for the County. Take information from conservation tillage survey and establish priorities for educational purposes and analyze data on tillage systems and crop residue cover. Seek to achieve a 10% increase in fields meeting crop residue targets countywide based on tillage transect survey. Promote enrollment of 10,000 acres into the residue management practice incentive program offered through the Environmental Quality Incentive Program (EQIP).

Who: *SWCD, NRCS **When:** 2005 – 2009 **Cost:** \$300,000

4. Reduce the amount of water erosion on severely eroded acres by the installation of the following conservation practices. Continue to work with the Yellow Medicine River Watershed and the Lac qui Parle Watershed Clean Water Partnerships to accelerate the implementation of those practices in the high priority areas:

- a. Terraces and/or water & sediment control basins 25,000 feet
- b. Grass Waterways 50 acres

Who: *SWCD, NRCS **When:** 2005 – 2009 **Cost:** \$300,000

5. Continue to manage CREP, RIM and CRP easements, monitor sites to see that conservation practices are installed and conduct status reviews.

Who: *SWCD, NRCS **When:** 2005 – 2009 **Cost:** \$10,000

6. Establish 800 new acres of filter strips/buffers along ditches and streams to capture sediment as it leaves the fields. Maintain the minimum one-rod grassed areas as it applies to drainage policy. Continue to work with the Yellow Medicine River Watershed and the Lac qui Parle Watershed Clean Water Partnerships to accelerate the implementation of those practices in the high priority areas.

Who: *SWCD, NRCS, DA, YMR, LqP **When:** 2005 – 2009 **Cost:** \$300,000

7. Enroll 500 acres of cropland subject to severe erosion into existing programs (i.e., CRP, RIM, etc.).

Who: *SWCD, NRCS

When: 2005 – 2009

Cost: \$150,000

8. Enroll 200 acres of pasture into prescribed grazing systems.

Who: *SWCD, NRCS

When: 2005 – 2009

Cost: \$2,000

9. Conduct an annual meeting of stakeholders and/or Local Work Group to discuss resource concerns and set priority areas for the Environmental Quality Incentive Program (EQIP). Promote installation of best management practices utilizing the EQIP and/or the State Cost Share Program, and the Ag BMP Loan Program for financial support. Convene Local Work Group Meetings for EQIP to discuss priority practices and priority areas. Assist with taking applications and planning for EQIP contracts.

Who: *SWCD, NRCS

When: 2005 – 2009

Cost: \$1,000

10. Educate landowners/operators about erosion and sediment control, the importance of installing conservation practices and encourage enrollment into conservation programs by providing information and options about BMP's through newsletters, news releases and individual contacts.

Who: *SWCD

When: 2005 – 2009

Cost: \$1,500

11. Restore 50 acres of wetlands into conservation programs.

Who: *SWCD, NRCS

When: 2005 – 2009

Cost: \$200,000

**PRIORITY ISSUE #3:
REDUCING PRIORITY POLLUTANTS**

Priority Concern:

“Reduce priority pollutants, nutrients and bacteria, related to feedlots and non-conforming individual sewage treatment systems.”

PRIORITY POLLUTANT GOAL: TO ENHANCE AND RESTORE THE COUNTY’S WATER QUALITY.

Objective A: Reduce priority pollutants to sustainable levels.

Actions:

1. Work with the Minnesota Pollution Control Agency to develop and action plan for removing the following Yellow Medicine’s impaired waters off the TMDL 303d listing:

Reach	New or Previous Listing	Affected use	Pollutant or stressor
Del Clark Lake	New	Aquatic consumption	Mercury and Fecal Coliform
Yellow Medicine River	Previous Listing	Impaired River	Mercury and Turbidity
Lac qui Parle River	Previous Listing	Impaired River	Mercury
Minnesota River	Previous Listing	Impaired River	Mercury, PCBs, Turbidity, and Fecal Coliform
Spring Creek	Previous Listing	Impaired River	Biota

- a. Facilitation and scoping – MPCA lead with County and other local resource partner’s assistance.
- b. Intense monitoring/problem investigation and verification – MPCA lead with County and other local resource partner’s assistance.
- c. TMDL development (model development, allocation exercise and public notice/EPA approval – MPCA lead with County and other local resource partner’s assistance.
- d. Implementation plan development – County and other local resource partner’s lead with MPCA and other assistance.
- e. Post monitoring and accomplishment reporting – County and other local resource partner’s lead.

Who: *MPCA, WPC, SWCD

When: 2005 – 2009

Cost: \$Unknown

2. Promote the timing, rate, and placement of synthetic and/or organic fertilizers and pesticides using incentives (such as EQIP and others). Develop nutrient and pesticide management plans, targeting 12,000 acres countywide. Provide continual information and education to landowners regarding the need to follow the University of Minnesota's nutrient management recommendations.

Who: *SWCD, NRCS **When:** 2005 – 2009 **Cost:** \$120,000

3. Upgrade 50 Individual Sewage Treatment Systems per year. Continually seek funding, administer the Ag BMP Loan Program and Clean Water Partnership Low Interest Loan Program offering landowners a low interest loan for fixing their non-conforming ISTS.

Who: *PZ, WPC, SWCD, **When:** 2005 – 2009 **Cost:** \$1,000,000
Watersheds

4. Seek funds to assist with TMDL or Clean Water Partnership based activities.

Who: *Watersheds **When:** 2005 – 2009 **Cost:** \$500

5. Protect Del Clark Lake by encouraging landowners to install Best Management Practices. Seal two abandoned wells, bring two non-conforming sewer systems, and one feedlot into compliance in the Canby Creek Watershed.

Who: *PZ, SWCD, WPC, NRCS **When:** 2005 – 2009 **Cost:** \$25,000

6. Implement the following strategies to address feedlot compliance:
- Continue to develop a GIS layer of feedlots registered under current MPCA registration guidelines.
 - Incorporate the database with the feedlots permitted by MPCA.
 - Develop an informational packet to mail to registered feedlot operators to assist them with contacts for technical questions (compliance, design, manure management) and financial incentives.
 - Assist 10% of the noncompliant feedlots by 2008.
 - Inspect 10% (approximately 37) of the County's feedlots annually.

Who: *PZ, WPC **When:** 2005 – 2009 **Cost:** \$15,000

7. Assist five feedlot operators per year with completing MPCA permits. Assist feedlot operators in seeking financial assistance through EQIP, State Cost-Share and the Ag BMP Low Interest Loan Program.

Who: *PZ, SWCD, NRCS **When:** 2005 – 2009 **Cost:** \$4,000

8. Create a GIS layer of all septic systems installed in the County.

Who: *PZ

When: 2006

Cost: \$10,000

9. Map cropland fields that have been identified as needed for manure application through manure management plans. This will be done by watershed.

Who: *PZ

When: 2005 – 2009

Cost: \$7,000

PRIORITY ISSUE #4: MANAGE FLOODING

Priority Concern:

“Manage flooding and its’ effects minimizing losses associated with the flooding of agricultural lands.”

FLOOD GOAL: TO IMPLEMENT SOUND FLOOD MANAGEMENT STRATEGIES

Objective A: Minimize losses associated with the flooding of agricultural lands.

Actions:

1. Address the smaller flood events such as 2 year and 5 year events by restoring 75 acres of wetlands through various conservation programs. Target sites within the watersheds to achieve strategic flood storage in conjunction with water quality and wildlife benefits.

Who: *SWCD, NRCS,
YMR, LqP

When: 2005 – 2009

Cost: \$300,000

2. Take flood prone land along rivers, streams and waterways out of crop production by encouraging enrollment into land retirement programs, such as CRP, RIM, WRP, etc., and applying best management practices to those areas (also see Priority Issue #2, Actions 6 and 7).

Who: *SWCD, NRCS

When: 2005 – 2009

Cost: \$20,000

3. Work with Area II, RCRCA, watershed, and surrounding counties to assess, prioritize and pursue funding through various agencies for water storage opportunities.

Who: *WPC, HD, YMR, LqP **When:** 2005 – 2009 **Cost:** \$2,000

4. Use the FEMA Floodplain maps to assess agricultural flooding problems and promote local, state and federal BMP programs.

Who: PZ, WPC **When:** 2005-2009 **Cost:** \$5,000

5. Seek assistance from landowners in reviewing the draft floodplain maps for accuracy. Provide input to DNR, FEMA and the Corps of Engineers on proposed corrections to the maps.

Who: PZ, WPC **When:** 2005 **Cost:** \$3,000

6. Update the County Floodplain Ordinance to reflect changes made to the program and the official maps.

Who: PZ **When:** 2005 **Cost:** \$5,000

**PRIORITY ISSUE #5:
SURFACE WATER AND DRAINAGE MANAGEMENT**

Priority Concern:

“Surface water and drainage management by addressing runoff volume and water quality deterioration due to excessive runoff.”

SURFACE WATER AND DRAINAGE MANAGEMENT GOAL: TO IMPLEMENT SOUND SURFACE WATER AND DRAINAGE MANAGEMENT STRATEGIES

Objective A: Apply watershed-based principles in properly managing drainage systems.

Actions:

1. Transfer existing County and Judicial Ditch information to ArcView and develop a GIS layer consisting of that information. GPS all County and Judicial ditches and identify existing filter strips along the ditches.

Who: *UMVRDC, DA, WPC **When:** 2005 **Cost:** \$32,000

2. Using the newly created layer developed in Action #1, gather data, create and maintain a database for each drainage system including name, location, petition year, size, outlet and repair history.

Who: Ditch Inspector, PZ **When:** 2005-2009 **Cost:** \$20,000

3. Promote the use of alternative intakes, such as blind intakes, that promote efficient trapping of sediments and nutrients that enter drainage systems. A blind intake cost share program will be offered to landowners to replace 20 open intakes with blind intakes.

Who: *SWCD, DA **When:** 2005 **Cost:** \$2,000

4. Seek funds to repair two or three small dams in the county that were previously constructed by landowners (Area II, SWCD, NRCS).

Who: *SWCD, NRCS, YMR **When:** 2005 – 2009 **Cost:** \$60,000
LqP

5. Promote upland treatment (encouraging landowners to install best management practices, seal abandoned wells and bringing non-conforming sewer systems and feedlots into compliance in the Lazarus Creek Watershed), protecting the Lazarus Creek Project.

Who: *LQP Watershed, Area II, SWCD **When:** 2005 - 2009 **Cost:** \$75,000

6. Utilize the US Fish and Wildlife Service Drained Wetland Basin Inventory, to help address current and future water quality and surface water management goals and issues.

Who: *SWCD, NRCS, WPC **When:** 2005 – 2009 **Cost:** \$5,000

7. Encourage the MPCA to include Wood Lake in their Lake Assessment Project.

Who: *WPC, CB

When: 2006

Cost: \$1,000

Chapter Three: Ongoing Activities

This Chapter identifies other activities and programs that make up the Local Water Management Program, but are not necessarily reflected in the priority concerns section (or the County's Scoping Document).

There are many agencies in Minnesota at the local, regional, state and federal levels that are involved with water and land use issues either in a regulatory capacity, or through an education and information development role. Programs administered by various resource partners will continue to be used during this ten-year water plan: such as the local Environmental Office, the Planning and Zoning Office, and the Soil and Water Conservation District; state agencies, such as the Board of Water and Soil Resources, the Minnesota Pollution Control Agency, and the University of Minnesota extension Service; and federal agencies, such as the Natural Resource Conservation Service and Farm Service Agency.

The following is a list of ongoing activities in Yellow Medicine County:

- Publish newsletters, news articles, and news releases to address water quality, water quantity, and conservation issues and concerns.
- Promote recycling and solid waste management.
- Provide well testing kits for the public.
- Continue to promote and staff the Household Hazardous Waste drop off site located in Clarkfield.
- Continue to enforce the Yellow Medicine County Feedlot Ordinance and assist producers with feedlot questions.
- Provide low interest loans for septic system upgrades through the watersheds Clean Water Partnerships.
- Administer the Shoreland and Floodplain Management Program.
- Work with the Minnesota Department of Agriculture as a testing site for commercial pesticide applicators.
- Continue to require permits and inspections for all newly installed septic systems.
- Select a conservation farmer.
- Participate in the MASWCD poster and essay contest.
- Set up displays at the fair, banks, restaurants, family resource fairs, etc.
- Distribute educational material to each grade level (Pre-school-6) in the county and conduct a presentation in each classroom.

- Sponsor a student to attend Long Lake Conservation Camp.
- Work with the SWMACDE to sponsor an Environmental Fair for all 6th graders.
- Distribute an education newsletter twice a year to all teachers, scout leaders, 4H leaders, etc.
- Promote soil stewardship week.
- Hold conservation days for all 5th graders in the county.
- Hold a field day for all 2nd grade students at Bert Raney School.
- Assist and promote the SWMACDE Area Envirothon and the State Envirothon.
- Work with Pezuta Zizi Environmental and Cultural Learning and Resource Center to present the Rocky Creek Ecosystem for the 5th and 6th graders at Bert Raney and H. A. Hagg Schools. Continue to serve on the Pezuta Zizi Board.
- Hold a mini Envirothon for Junior High Students.
- Develop promotional presentation for local organizations.
- Offer a scholarship to a graduating student majoring in natural resources, age or a related field.
- Provide assistance in implementing the Federal Farm Program. (SWCD)
- Continue to Administer the 1991 Wetland Conservation Act. (SWCD)
- Continue to monitor groundwater observation wells designated by DNR. (SWCD)
- Continue to comment on DNR water permits. (SWCD)
- Participate in the state rainfall-monitoring program by selecting rainfall monitors to record daily precipitation. (SWCD)
- Yellow Medicine County has designated the entire county as a high priority wetland preservation area. The county will continue to accept and process eligible applications for wetland preservation on a countywide basis.
- The Yellow Medicine County Comprehensive Plan will be updated and is scheduled to be completed in 2006. The Yellow Medicine County Land Use and Related Resource Ordinance will also be updated.

***For more information about Yellow Medicine County's
Ongoing Activities, please contact the following:***

Yellow Medicine County Zoning and Ag Office

1000 10th Avenue; P.O. Box 675

Clarkfield, MN 56223-0675

(320) 669-7524

CHAPTER FOUR: PLAN ADMINISTRATION

Chapter Four contains information on administering the Yellow Medicine County Water Plan.

Plan Coordination

Managing Yellow Medicine County's water resources is a complicated task, involving many local, State and Federal agencies, as well as private citizens and special interest groups. For any water planning activity to be successful, a well-coordinated effort is needed. Yellow Medicine County is committed to working with each of these entities to ensure proper management of its water resources.

Implementation

Yellow Medicine County will ensure coordination and implementation of its Comprehensive Local Water Plan through its established Water Plan Committee. The Committee will meet, at least quarterly, to review progress, identify emerging problems, opportunities and issues and continue to direct the implementation of the plan. Committee members will be appointed by the County Board. The Committee will be supported by the County Board appointed Water Plan Coordinator. The coordinator shall administer the implementation of this plan, coordinate Committee activities, write grant proposals, prepare annual work plans and reports and other activities as specified by the Yellow Medicine County Board of Commissioners.

Schedule

Coordination of the Comprehensive Local Water Plan activities will commence with the County Board adoption of the Plan. These activities will be conducted throughout the planning period identified as January 1, 2005, through December 31, 2014, with a five year implementation plan (2005 – 2009).

Role of the County in Implementation

The County recognizes the importance of comprehensive local water planning and the key role the County, township and city government must play in water planning decisions that impact water resources. The Water Plan's goals, objectives and actions are a reflection of the water related concerns in the County. Implementation will be based on current needs, funding and availability of staff. Consideration will be given to changes in State initiatives and regulations. The annual work plan will be a detailed strategy of measurable criteria for actions to be carried out. The County realizes that completion of all goals and objectives requires staff and funds beyond the County budget. It is also understood that State funding cannot provide the funding for all goals and objectives for all counties. The County, through various sources, will pursue outside funding opportunities as they become available.

Role of Other Agencies in Implementation

Throughout the Comprehensive Local Water Plan, County departments, local government units, special interest groups, and State and Federal agencies that are involved are listed. It is hoped that the valuable cooperation that has been established over the past years will continue.

Consistency with Other Plans

Many ongoing and existing County programs and/or ordinances will continue to be implemented or enforced for source water protection. For example, the Yellow Medicine County Land Use and Related Resource Management Ordinance will be enforced on an ongoing basis. The Land Use Ordinance includes sections relating to feedlots, floodplains, shorelands, nuisances, individual sewage treatment systems, among numerous others. The County also enforces the Yellow Medicine County Solid Water Management Plan that guides solid waste related activities and strategies. Education and information will continue to periodically address other waste management issues.

The County will also continue to cooperate with the Yellow Medicine River Watershed as they continue their Clean Water Partnership implementation. Likewise, the County will assist with the Lac qui Parle-Yellow Bank Watershed as they pursue the funding needed for implementing their Clean Water Partnership. Finally, the County will continue to cooperate with the Yellow Medicine Soil and Water Conservation District for the administration of the Wetland Conservation Act and enrollment of acres into the Wetland Preservation Area Program.

Recommended Changes to State Programs

In order to implement the goals and objectives set forth in the Yellow Medicine County Comprehensive Local Water Plan, continued cooperation between the County and various State agencies is necessary. In an effort to increase coordination in this effort, the County makes the following recommended changes to State agency programs:

- A. Counties should continue to be notified of State agency program changes and the availability of funding;
- B. Data collected by State agencies should be readily shared with the County and other agencies to avoid duplicative efforts;
- C. State agencies should continue to provide local and/or regional staff to assist local officials with agency programs;
- D. Fees collected at the County level should be allowed to remain within the County to administer and implement water-related programs;
- E. An annual listing of State agency staff that are assigned to water management planning should be created to facilitate increased coordination between local officials and agency staff; and
- F. State agencies should provide greater flexibility to counties in setting annual work plan priorities. Priorities should be based upon current needs, funding, availability of staff and changes in State initiatives and regulations.

Intergovernmental Conflicts/Resolution Process

In the development of this plan, there were no intergovernmental conflicts that arose. In the event of an intergovernmental conflict, the Yellow Medicine County Board of Commissioners shall request the Yellow Medicine County Water Plan Committee to intervene and informally negotiate resolution of the conflict. If the Committee does not resolve the conflict, the County shall petition the Board of Water and Soil Resources (BWSR) for a contested case hearing.

Major Plan Amendment Procedure

The Yellow Medicine County Comprehensive Local Water Plan is intended to extend through the year 2014. The County may prepare proposed amendments to the plan prior to 2014; however, the plan will be updated, including any proposed plan amendments, before the end of 2014. The following procedures will be used by Yellow Medicine County to deal with proposed major amendments to the County Comprehensive Local Water Plan:

- A. When issues are brought to the attention of the County with regard to the need for amendments to its adopted County Comprehensive Local Water Plan, the County will refer that person, group, local unit of government, or agency to the County's Water Plan Committee.
- B. The Yellow Medicine County Water Plan Committee will review the issue and may, if necessary, undertake studies or investigations to gather information relating to the issue. After reviewing the issue, the County Water Plan Committee will determine whether the County Comprehensive Local Water Plan should be amended.
- C. If the County Water Plan Committee determines that the County Comprehensive Local Water Plan should be amended, it will make recommendations to the County Board. The County Board shall approve or disapprove the proposed amendment.

After development, but before final adoption by the County Board, a proposed amendment to the County Comprehensive Local Water Plan must be submitted for local review and comment in the following manner. The County must submit the proposed plan amendment to all local units of government wholly or partly within the County, the applicable regional development commission (if any), each contiguous county and watershed management organization and other counties or watershed management organizations within the same watershed unit and groundwater system that may be affected by the proposed plan amendment.

A local unit of government must review the proposed amendment and its existing water and land-related land resources plan or official controls and in its comments describe in a general way, possible amendments to its existing plans or official control, and an estimate of the fiscal or policy effects that would be associated with those amendments, to bring them into conformance with the proposed plan amendment. A county or watershed management organization within the same watershed unit or groundwater system must review the proposed plan amendment and describe in its comments possible conflicts with its existing or proposed comprehensive water plan and suggest measures to resolve the conflicts. The regional development commission must review the proposed amendment under Section 462.391, Subdivision 1.

Comments from local review must be submitted to the County Board within 60 days after receiving a proposed plan amendment for comment, unless the County Board determines that good cause exists for an extension of this period and grants an extension. The County Board must conduct a public hearing on the proposed plan amendment pursuant to Section 375.51 after the 60-day period for local review and comment is completed, but before it is submitted to the State.

After conducting the public hearing, but before final adoption, the County Board must submit the proposed plan amendment, all written comments, a record of the public hearing and a summary of changes incorporated in the proposed plan amendment as a result of the review process to the BWSR for review. The BWSR must complete the review within 90 days after receiving the proposed County Comprehensive Local Water Plan amendment and support document. The BWSR must consult with the Departments of Agriculture, Health, Natural Resources, Pollution Control, Planning Agency, Environmental Quality and other appropriate State agencies during the review.

The BWSR may disapprove a proposed amendment if it determined the amendment is not consistent with State law or the principles of sound hydrologic management, effective environmental protection and efficient management. If the amendment is disapproved, the BWSR must provide a written statement for its reasons for disapproval. The disapproved County Comprehensive Local Water Plan amendment must be revised by the County Board and resubmitted for approval by the BWSR within 120 days after receiving notice of disapproval, unless the BWSR extends the period for good cause. The decision of the BWSR to disapprove the amendment may be appealed by the county to District Court. A County Board must adopt and begin implementation of its amended County Comprehensive Local Water Plan within 120 days after receiving notice of approval of the amendment from the BWSR.

Minor Plan Amendment Procedure

If a revision/amendment to the Yellow Medicine County Comprehensive Local Water Plan is considered to be minor in nature, the following revision process will be followed:

- A. The Yellow Medicine County Board of Commissioners will receive a recommendation from the Yellow Medicine County Water Plan Committee for an amendment to the Water Plan.
- B. At the Board of Commissioners' meeting, where the amendment is introduced, the County will hold a public hearing to explain the amendments and publish a legal notice of the hearing at least ten (10) days before the date of the hearing.
- C. The County will send copies of the amendments to the BWSR Board Conservationist assigned to Yellow Medicine County for review and comment.

General Information

All amendments adopted by the County will be printed in the form of replacement pages for the Comprehensive Local Water Plan. Each page will show deleted text as stricken and new text as underlines on draft amendments, as needed, and include the effective date of the amendment. The County will maintain a distribution list of agencies and individuals who have received a copy of the Comprehensive Local Water Plan and the County shall distribute copies of the amendment(s) within thirty days of adoption.

Appendix A:

Yellow Medicine County

Water Plan Scoping Document

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Priority Concerns Scoping Document

For

Yellow Medicine County Local Water Management Plan

December 2003

History:

The Yellow Medicine County Local Water Management planning process of addressing priorities has included the following actions:

- **November 20, 2002:** The Water Plan Coordinator sent a request to various local and state agencies to submit priority concerns that they would like to see addressed in the Water Plan. Comments were received from the Department of Agriculture, Redwood-Cottonwood Rivers Control Area, Minnesota Pollution Control Agency, Minnesota Department of Health, Department of Natural Resources, US Fish and Wildlife Service, Board of Water and Soil Resources, Yellow Medicine River Watershed, Yellow Medicine Soil and Water Conservation District, City of Clarkfield, Yellow Medicine County Ditch Inspector and the University of Minnesota Extension Service.
- **December 4, 2002:** A letter was sent to all cities and townships within the county, adjacent counties, rural water systems, watershed districts, county highway department, RCRC, UMVRDC, Area II, BWSR, SWCD and the Yellow Medicine County Ditch Inspector. The letter informed them of Yellow Medicine County's intent to update the local water plan and requested a copy of existing plans and a list of priority concerns that they would like to see included in the Plan.
- **December 2002:** A survey was included in the December issue of the Water Quality/Quantity newsletter. This newsletter/survey was sent to every resident in Yellow Medicine County. Residents were instructed to identify their top ten environmental concerns. Fifteen responses were received.
- **January 29, 2003:** An issues identification meeting was held in Marshall, MN. The meeting was attended by representatives from the Minnesota Department of Health, Department of Natural Resources, US Fish and Wildlife Services, Board of Water and Soil Resources, Natural Resources Conservation Service, Lincoln Pipestone Rural Water, Soil and Water Conservation Districts and Lincoln County and Yellow Medicine County staff. Comments received were discussed and new issues were identified.
- **February 25, 2003:** The Yellow Medicine County Water Task Force held a public hearing to receive input from the general public, cities, townships and local government agencies. There were three members of the public in attendance.
- **April 30, 2003:** The Yellow Medicine County Water Task Force convened to review and discuss the issues identified at the various meetings that had been held and correspondence that had been received. At this meeting the priority concerns were drafted.

RESULTS:

Written responses to the November 20, 2002 and December 4, 2002 request for priority concerns include the following comments:

- **Minnesota Pollution Control Agency (MPCA)** - Feedlots, TMDL's, ISTS, Unsewered Areas and Storm Water
- **Minnesota Department of Health (MDH)** - Wellhead protection
- **Minnesota Department of Natural Resources (DNR) - Wildlife-** Wetland Restoration
- **US Fish and Wildlife Service (USFWS)- Morris Wetland Management District** - Wetland and Prairie Restoration, Protect existing wetland and native prairie habitats, Flood control and water quality improvement
- **Minnesota Department of Natural Resources (DNR) - Waters** - Water quality, drainage, groundwater quality and availability, stream/river stability and restoration
- **Board of Water and Soil Resources (BWSR)** - Integrate plans, address run-off volume, protect groundwater resources.
- **Minnesota Department of Agriculture (MDA)** - Feedlots, manure management, erosion control
- **Yellow Medicine Soil and Water Conservation District (SWCD)** - Promote and enhance surface water quality by reducing the amount of sedimentation and pollutants entering the County's lakes, streams, rivers and wetlands; protect surface and groundwater supplies from contamination caused by point and nonpoint pollution; preserve existing wetlands and restore legally drained wetlands having potential for flood damage reduction, wildlife, recreational, and groundwater recharge benefits.
- **Yellow Medicine River Watershed District (YMRWD)** - Nutrient management, protect and improve existing surface and ground water quality, river bank restoration, erosion control
- **City of Clarkfield** - Well sealing, groundwater and surface water protection, wellhead protection
- **Yellow Medicine County Ditch Inspector** - Prevent soil erosion
- **Yellow Medicine County Extension Service** - Environmental education
- **Fortier Township** - no concerns

The comments and concerns listed above were discussed at the issues identification meeting held on January 29, 2003, in Marshall, MN. Additional discussion also took place and in summary, the concerns were categorized into the following:

- Restorable Wetlands Inventory
- Reduce priority pollutants with Best Management Practice (BMPs) emphasis
- Drainage
- Education
- Intergovernmental Cooperation
- Recreation, Tourism, Fisheries & Wildlife
- Groundwater Protection

A survey was placed in the December 2002 Water Quality/Quantity newsletter. The newsletter was sent to every household in the County. The survey consisted of a list of concerns and issues related to water. There was also an opportunity for respondents to offer their own suggestions or concerns. The following are the results of the survey, in order of importance, as rated by those who responded.

- Protect ground water supplies from contamination
- Protect surface water from contamination
- Reduce the amount of sedimentation entering the County's lakes, streams and rivers
- Promote the use of BMP's
- Promote the proper use of household hazardous waste, pesticides, etc.
- Preserve existing wetlands
- Bring feedlots into compliance
- Identify sensitive geologic areas which may cause groundwater contamination
- Restore drained wetlands that have flood damage reduction or wildlife and recreational benefits
- Improve flood control efforts
- Increase and enhance the recreational use of waters of Yellow Medicine County
- Work with landowners to test their private wells
- Properly seal abandoned wells
- Address illegal dumping of solid waste and demolition debris
- Clean up unpermitted junk yards
- Identify and remove underground storage tanks
- Bring non-conforming individual sewage treatment systems into compliance
- Provide municipalities with assistance in developing a wellhead protection plan
- Reduce the amount of wind erosion on severely erodible acres
- Assist in the construction of flood damage reduction structures
- Limit/remove/reduce development of agricultural uses in flood prone areas
- Expand surface and ground water monitoring
- Increase the number of acres of native prairie in the County
- Provide support for the development of nutrient/manure management plans for feedlots

Issues identified at the public hearing include tree removal from the waterways in the County, septic systems, feedlots and best management practices.

Setting the Priority Concerns for Yellow Medicine County:

The Yellow Medicine County Water Task Force determined from the above concerns that the focus for the next five years would be the following:

1. Groundwater Protection: aiding public water suppliers with the development of wellhead protection plans and by providing assistance to help manage vulnerable areas from potential contamination sources.

2. Erosion and Sediment Control on agricultural lands located in the Yellow Medicine and Lac qui Parle Watersheds.
3. Reduce priority pollutants, nutrients and bacteria, related to feedlots and non-conforming individual sewage treatment systems.
4. Manage flooding and its' effects minimizing losses associated with the flooding of agricultural lands.
5. Surface water and drainage management by addressing runoff volume and water quality deterioration due to excessive runoff.

These five issues will be the focus in the creation of the goals, objectives and an implementation plan.

The following issue will not be addressed within the scope of the Local Water Management Plan are:

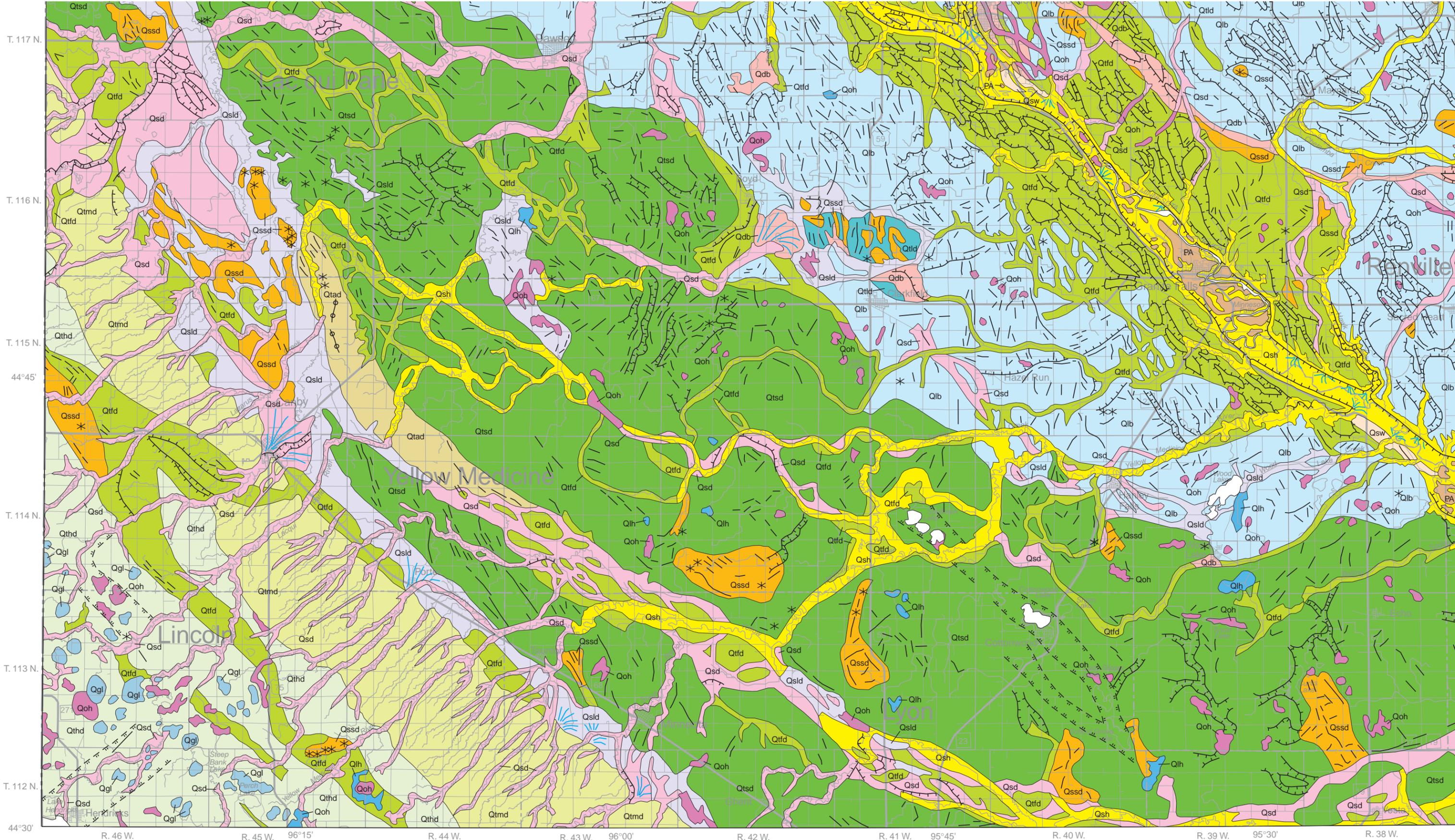
- Integrate County land use plans with the water plan and develop one implementation strategy.
The Yellow Medicine County Comprehensive Land Use Management Plan is outdated, however, because of budget concerns the County does not plan to update this document in the near future. The Water Task Force has chosen to keep the documents separate but will utilize the existing document any way possible and will work closely with the Yellow Medicine County Zoning Office in the development and implementation of the Local Water Plan.
- Identify and remove underground storage tanks.
This will not be addressed due to lack of funding.
- Address illegal dumping of solid waste and demolition debris and the clean up of unpermitted junk yards.

These issues will be handled by the Environmental Office and the Zoning Office.

Appendix B:

Regional Hydrogeologic Maps Cropped to Yellow Medicine County

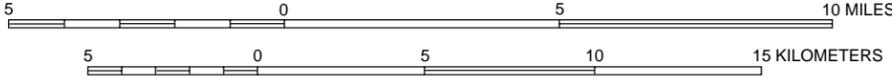
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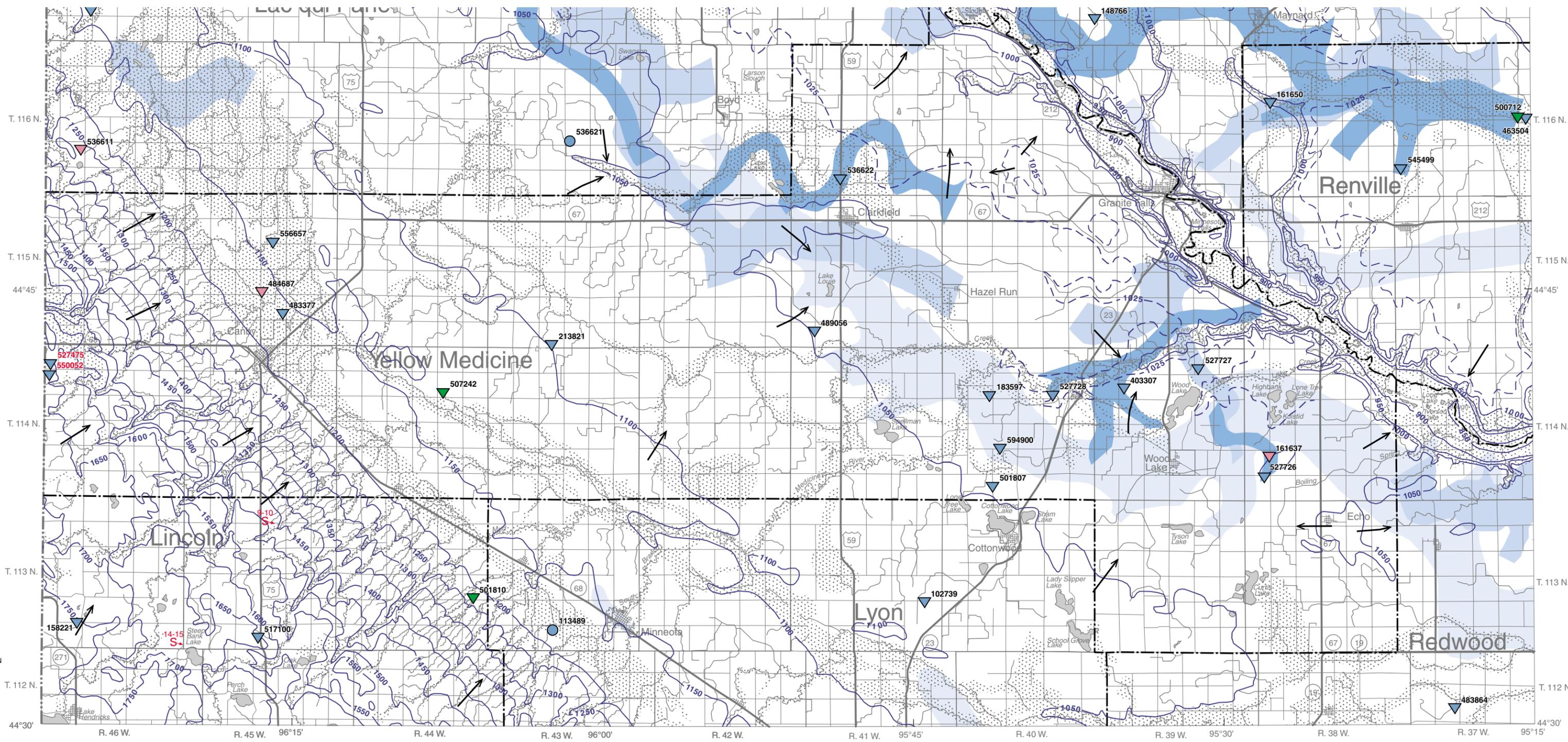
Digital base modified from 1990 Census TIGER/Line Files of U.S. Bureau of the Census (source scale 1:100,000); county border files modified from Minnesota Department of Transportation files; digital base annotation by Minnesota Geological Survey

Universal Transverse Mercator Projection, grid zone 15 1927 North American Datum

SCALE 1:200 000



Yellow Medicine County
Regional Hydrogeologic Assessment
Plate 1

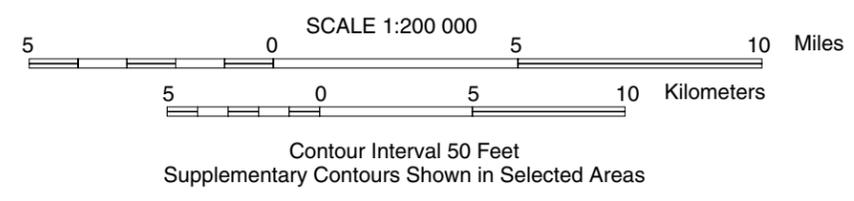


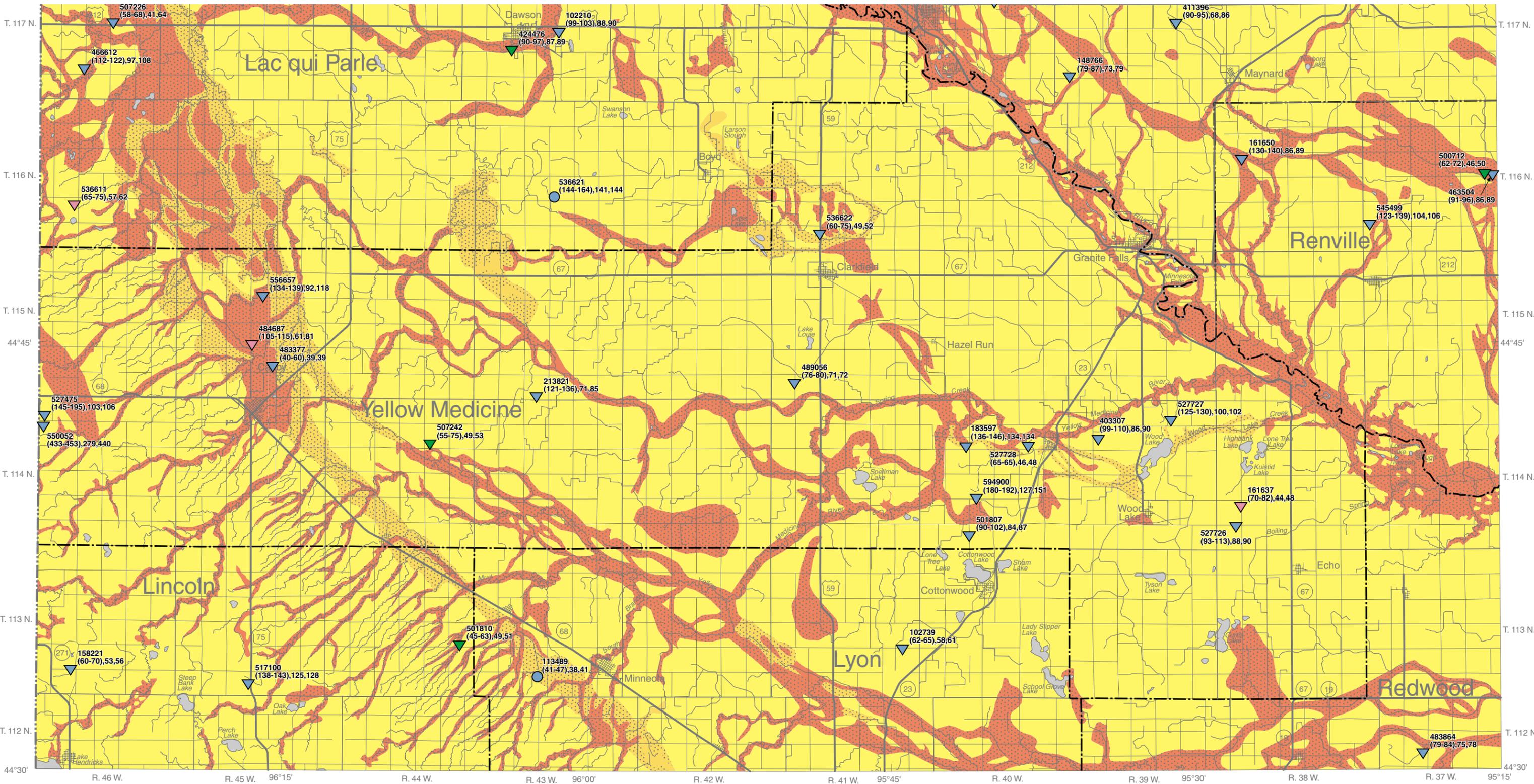
Digital base map composite:
 Roads and county boundaries - Minnesota Department of Transportation GIS Statewide Base Map (source scale 1:24,000)
 Hydrologic features - U.S. Geological Survey Digital Line Graphs (source scale 1:100,000)
 Digital base map annotation - Minnesota Geological Survey.

Project data compiled from 1997 to 1999 at the scale of 1:200,000. Universal Transverse Mercator projection, grid zone 15, 1983 North American datum. Vertical datum is mean sea level.

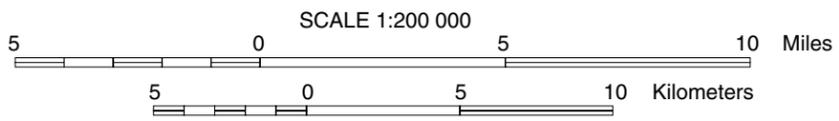
GIS and cartography by Randy McGregor. Edited by Nick Kroska. Digital assembly by Nordic Press.

GIS data and metadata available through the Ground Water Mapping Program website:
http://www.dnr.state.mn.us/waters/programs/gw_section/cgarha/index.html





WARNING: This map provides an overview of ground-water contamination potential as interpreted from 1:200,000-scale geologic map information. THIS MAP SHOULD NOT BE THE BASIS FOR EVALUATION OF SPECIFIC SITES.



Digital base map composite:
 Roads and county boundaries - Minnesota Department of Transportation GIS Statewide Base Map (source scale 1:24,000)
 Hydrologic features - U.S. Geological Survey Digital Line Graphs (source scale 1:100,000)
 Digital base map annotation - Minnesota Geological Survey.

Project data compiled from 1997 to 1999 at the scale of 1:200,000. Universal Transverse Mercator projection, grid zone 15, 1983 North American datum. Vertical datum is mean sea level.

GIS and cartography by Randy McGregor (modified from Minnesota Geological Survey RHA-4, Pl. 1 [Surficial Geology]; digitized by Joyce Meints). Edited by Nick Kroska. Digital Assembly by Nordic Press.

Appendix C:

**Minnesota Riparian Landuse and
Conservation Lands Summary**



MINNESOTA RIPARIAN LANDUSE

100' / 100 yr. Zone

County	Total County		Basin Acres		Riparian Zone		Riparian Zone		Cultivated	Cult%
	Acres	Acres	Acres	Acres	Total Acres	Zone	Total Acres	Zone		
REDRIVER MN CREP										
Becker	925,053	663,375	107,751	10,744	10,744					10%
Beltrami	1,954,919	1,435,347	348,999	7,918	7,918	2%				2%
Big Stone	338,278	65,317	3,637	1,553	1,553	43%				43%
Clay	674,348	674,170	49,950	22,319	22,319	45%				45%
Clearwater	659,003	530,774	41,832	6,851	6,851	16%				16%
Grant	368,560	242,426	19,382	9,451	9,451	49%				49%
Itasca	1,872,344	21,063	908	0	0	0%				0%
Kittson	706,936	706,928	127,875	97,052	97,052	76%				76%
Koochiching	2,017,035	193,858	7,899	14	14	0%				0%
Lake of the Woods	1,138,952	26,639	419	0	0	0%				0%
Mahnomen	373,527	373,526	39,060	8,607	8,607	22%				22%
Marshall	1,161,057	1,160,876	233,995	142,987	142,987	61%				61%
Norman	561,579	94,061	7,403	7,403	7,403	8%				8%
Otter Tail	1,423,942	894,768	171,278	8,415	8,415	5%				5%
Pennington	395,633	395,633	38,191	28,339	28,339	74%				74%
Polk	1,279,453	1,279,327	254,144	184,181	184,181	72%				72%
Red Lake	277,189	24,576	13,684	13,684	13,684	56%				56%
Roseau	1,074,139	924,934	240,500	112,122	112,122	47%				47%
Stevens	368,351	91,883	7,384	4,788	4,788	65%				65%
Traverse	375,284	353,716	31,197	16,669	16,669	53%				53%
Wilkin	481,181	481,000	53,951	43,304	43,304	80%				80%
Total Acres	18,426,763	11,354,204	1,896,990	726,400	726,400	39%				39%
SE MN CREP										
Blue Earth	489,720	1,707	74	50	50	67%				67%
Dakota	374,972	296,956	45,319	18,148	18,148	40%				40%
Dodge	281,158	281,158	20,891	12,727	12,727	61%				61%
Faribault	461,621	434	3	2	2	57%				57%
Fillmore	551,448	551,394	48,518	13,828	13,828	29%				29%
Freeborn	461,950	361,146	26,462	13,397	13,397	51%				51%
Goodhue	499,082	499,006	74,125	20,781	20,781	28%				28%
Houston	363,934	363,770	74,795	17,306	17,306	23%				23%
Le Sueur	303,015	92,808	20,000	3,141	3,141	16%				16%
Mower	455,000	454,960	40,266	23,859	23,859	59%				59%
Olmsted	418,734	418,734	47,595	14,880	14,880	31%				31%
Rice	329,907	298,819	32,397	10,318	10,318	32%				32%
Scott	235,502	13,954	1,961	336	336	17%				17%
Steele	276,470	253,569	14,039	8,311	8,311	59%				59%
Wabasha	351,366	351,324	73,549	17,386	17,386	24%				24%
Waseca	276,941	50,626	4,359	1,363	1,363	31%				31%
Washington	270,974	8	12	0	0	0%				0%
Winona	410,315	410,227	67,018	10,508	10,508	16%				16%
Total Acres	6,812,110	4,700,600	591,382	186,341	186,341	32%				32%
SW MN CREP										
Cottonwood	415,034	105,320	9,837	3,048	3,048	31%				31%
Jackson	460,258	399,995	31,219	11,154	11,154	36%				36%
Lincoln	351,288	52,649	4,649	1,559	1,559	34%				34%
Lyon	462,076	14,245	1,566	255	255	16%				16%
Martin	466,604	109,767	7,404	2,340	2,340	32%				32%
Murray	460,664	387,503	40,140	14,251	14,251	36%				36%
Nobles	462,633	462,622	34,978	18,000	18,000	51%				51%
Pipestone	298,520	281,858	25,852	10,975	10,975	42%				42%
Rock	309,151	309,135	27,741	13,496	13,496	49%				49%
Total Acres	3,686,229	2,123,095	183,386	75,077	75,077	41%				41%
MN RIVER CREP										
Big Stone	338,278	272,898	26,597	7,856	7,856	30%				30%
Blue Earth	489,731	487,998	36,268	12,772	12,772	35%				35%
Brown	395,607	395,607	48,517	25,900	25,900	53%				53%
Chippewa	376,407	376,407	49,186	29,478	29,478	60%				60%
Cottonwood	415,044	309,721	19,473	12,350	12,350	63%				63%
Douglas	460,946	205,716	7,624	2,287	2,287	30%				30%
Faribault	461,485	461,051	17,127	11,014	11,014	64%				64%
Freeborn	461,473	100,782	3,199	2,754	2,754	86%				86%
Grant	368,568	126,136	17,357	3,230	3,230	19%				19%
Jackson	460,268	60,233	2,219	1,505	1,505	68%				68%
Kandiyohi	551,868	259,179	11,649	8,015	8,015	69%				69%
Lac qui Parle	498,329	498,307	68,310	35,835	35,835	52%				52%
Le Sueur	302,985	210,176	26,968	9,297	9,297	34%				34%
Lincoln	351,298	298,634	29,518	12,643	12,643	43%				43%
Lyon	462,086	447,841	34,553	18,163	18,163	53%				53%
McLeod	323,360	41,653	3,702	6,638	6,638	63%				63%
Martin	466,613	356,830	11,194	1,667	1,667	59%				59%
Murray	460,673	73,163	4,042	1,667	1,667	41%				41%
Nicollet	298,537	298,537	28,051	15,079	15,079	54%				54%
Otter Tail	1,423,973	154,557	1,909	569	569	30%				30%
Pipestone	298,526	16,650	1,248	532	532	43%				43%
Pope	458,955	393,306	32,961	5,139	5,139	16%				16%
Redwood	564,194	564,194	38,772	26,069	26,069	67%				67%
Renville	631,739	465,741	28,461	17,336	17,336	61%				61%
Rice	329,870	31,062	1,940	1,270	1,270	65%				65%
Sibley	384,139	373,341	29,719	16,629	16,629	56%				56%
Steele	276,476	22,902	642	453	453	71%				71%
Stevens	368,359	276,475	30,419	15,882	15,882	52%				52%
Swift	481,455	481,448	40,391	21,121	21,121	52%				52%
Traverse	375,292	21,525	737	406	406	55%				55%
Waseca	276,947	226,320	10,091	6,601	6,601	65%				65%
Watwan	281,255	281,255	12,388	8,105	8,105	65%				65%
Yellow Medicine	488,667	488,660	58,084	39,068	39,068	67%				67%
Total Acres	14,583,403	9,078,305	733,316	377,993	377,993	52%				52%
GRAND TOTAL										
	43,508,505	27,256,204	3,405,075	1,365,810	1,365,810	40%				40%



CONSERVATION LANDS SUMMARY

BWSR Prepared: 08/19/04

COUNTY	TOTAL										OTHER DATA				
	CRP ACRES	CONTINUOUS CRP ACRES	CREP ACRES	RIM	RIM WRP	WRP	RESOURCE ACRES	CROPLAND ACRES	PERCENT ENROLLED	EASE/ACQ.	DNR WMA	NATURAL LANDS	SIZE TOTAL ACRES	PERCENT HABITAT	
AITKIN	131.9	556.4	0.0	61.8	0.0	0.0	750.1	77,034.8	1.0%	14,496.86	52,458.00	1,179,455.25	1,275,737	97.76%	
ANOKA	105.0	212.7	0.0	0.0	0.0	0.0	317.7	44,632.9	0.7%	0.00	17,458.00	146,579.30	283,069	57.65%	
BECKER	31,185.2	3,325.2	0.0	135.4	0.0	593.0	35,238.8	307,783.7	11.4%	52,739.10	6,650.00	548,460.37	925,043	69.52%	
BELTRAMI	17,370.3	185.7	0.0	206.5	0.0	0.0	17,762.5	143,724.5	12.4%	0.00	192,509.00	1,602,946.44	1,954,893	92.75%	
BENTON	664.0	1,498.9	0.0	423.2	0.0	0.0	2,586.1	133,396.9	1.9%	0.00	1,945.00	114,040.06	264,211	44.88%	
BIG STONE	6,411.9	1,669.6	732.3	567.9	20.6	605.0	10,007.3	251,987.0	4.0%	20,716.39	10,454.00	49,885.21	338,272	26.92%	
BLUE EARTH	4,706.1	2,875.2	5,329.1	486.3	287.3	1,462.0	15,146.0	392,239.0	3.9%	1,285.79	4,354.00	74,293.85	489,715	19.42%	
BROWN	5,636.8	3,320.3	4,968.0	885.9	0.0	1,114.0	15,925.0	335,790.0	4.7%	0.00	2,769.00	44,779.98	395,590	16.05%	
CARLTON	198.4	231.9	0.0	0.0	0.0	0.0	430.3	52,479.7	0.8%	0.00	3,659.00	532,287.11	559,738	95.83%	
CARVER	2,006.2	564.4	127.4	535.7	23.6	162.0	3,419.3	137,077.9	2.5%	2,099.57	772.00	96,160.25	240,442	42.61%	
CASS	452.8	295.8	0.0	53.3	0.0	0.0	801.9	80,935.2	1.0%	43.00	18,338.00	1,480,885.65	1,544,115	97.15%	
CHIPPEWA	4,325.2	4,600.0	7,815.7	1,156.1	149.7	133.0	18,179.7	326,760.0	5.6%	411.10	11,361.00	29,402.30	376,390	15.77%	
CHISAGO	439.2	301.4	0.0	59.6	0.0	0.0	800.2	97,257.4	0.8%	0.00	8,951.00	163,583.83	283,021	61.24%	
CLAY	40,869.7	3,319.3	0.0	1,526.3	0.0	1,102.0	46,817.3	524,605.4	8.9%	14,072.31	6,102.00	87,060.59	674,342	22.84%	
CLEARWATER	9,425.2	1,218.8	0.0	251.5	150.9	0.0	11,046.4	125,931.3	8.8%	864.00	4,652.00	513,979.92	658,995	80.51%	
COOK	0.0	0.0	0.0	0.0	0.0	0.0	11.0	946.0	1.2%	0.00	0.00	1,023,245.97	1,027,613.04	99.58%	
COTTONWOOD	8,479.3	3,008.9	3,302.2	1,267.6	65.0	48.0	16,171.0	360,943.0	4.5%	3,137.99	6,287.00	35,558.06	415,027	14.73%	
CROW WING	480.0	40.7	0.0	0.0	0.0	0.0	520.7	60,183.3	0.9%	0.00	4,755.00	697,883.98	739,776	95.05%	
DAKOTA	1,730.2	2,232.1	0.0	93.1	0.0	0.0	4,055.4	207,049.0	2.0%	270.95	3,350.00	112,944.99	374,970	32.17%	
DODGE	1,979.0	1,551.6	0.0	45.4	0.0	0.0	3,576.0	226,715.9	1.6%	0.00	754.00	29,452.79	281,152	12.02%	
DOUGLAS	28,584.8	2,570.1	2,341.8	1,184.6	23.6	510.0	35,214.9	236,375.0	14.9%	16,543.48	4,449.00	188,906.32	460,928	53.18%	
FARIBAULT	1,054.0	1,157.2	3,943.7	868.6	0.0	41.0	7,064.5	415,041.0	1.7%	959.43	2,889.00	31,757.99	461,613	9.24%	
FILLMORE	16,193.9	2,902.7	0.0	296.3	0.0	0.0	19,392.9	346,876.0	5.6%	0.00	1,641.00	189,576.37	551,443	38.19%	
FREEBORN	6,039.5	4,917.1	612.0	491.7	1,929.5	2,572.0	16,561.8	390,339.0	4.2%	1,910.18	1,485.00	82,849.03	461,946	15.76%	
GOODHUE	7,899.6	1,321.3	0.0	805.4	0.0	0.0	10,026.3	303,255.3	3.3%	0.00	4,349.00	155,693.74	499,078	34.08%	
GRANT	14,411.4	13,363.0	404.8	633.2	0.0	971.0	29,783.4	293,726.0	10.1%	13,675.39	3,539.00	52,258.91	368,557	26.93%	
HENNEPIN	800.3	426.7	0.0	158.9	0.0	4.0	1,389.9	58,618.2	2.4%	2,503.00	67.00	147,661.34	388,090	39.07%	
HOUSTON	15,209.7	1,443.0	0.0	1,459.6	0.0	175.0	18,287.3	149,239.1	12.3%	12,221.00	346.00	202,978.50	363,930	64.25%	
HUBBARD	1,661.8	432.7	0.0	0.0	0.0	0.0	2,094.5	80,716.7	2.6%	0.00	3,927.00	602,613.26	639,514	95.17%	
ISANTI	549.4	293.7	0.0	63.5	0.0	0.0	906.6	106,567.7	0.9%	0.00	4,915.00	169,462.33	288,723	60.71%	
ITASCA	723.5	553.3	0.0	0.0	0.0	0.0	1,276.8	30,959.4	4.1%	0.00	8,996.00	1,822,598.70	1,872,320	97.89%	
JACKSON	6,110.1	2,872.6	548.4	1,446.9	52.6	482.0	11,512.6	397,317.0	2.9%	4,552.65	5,051.00	43,607.38	460,250	14.06%	
KANABEC	171.9	198.5	0.0	181.2	0.0	0.0	551.6	71,727.1	0.8%	0.00	9,421.00	255,318.73	341,274	77.74%	
KANDIYOHI	30,012.8	4,086.6	2,973.8	2,991.5	88.7	69.0	40,222.4	377,217.0	10.7%	17,827.68	3,409.00	135,232.92	551,859	35.64%	
KITSON	101,002.9	7,999.8	0.0	379.2	0.0	177.0	109,558.9	468,948.4	23.4%	0.00	56,024.00	175,972.36	706,925	48.32%	
KOOCHICING	57.9	94.0	0.0	0.0	0.0	0.0	151.9	41,861.3	0.4%	0.00	1,014.00	2,007,376.75	2,017,005	99.58%	
LAC QUI PARLE	21,104.0	6,356.9	7,823.0	966.3	64.9	0.0	36,315.1	410,614.0	8.8%	15,930.49	20,941.00	41,929.52	498,310	23.10%	
LAKE	0.0	2.9	0.0	0.0	0.0	0.0	1,606.0	1,606.0	0.2%	0.00	601.20	1,453,141.77	1,463,540.58	99.33%	
LAKE of the WOODS	3,151.1	311.7	0.0	0.0	0.0	203.0	3,665.8	90,825.5	4.0%	0.00	158,429.00	917,393.08	1,138,938	94.78%	
LE SUEUR	11,167.8	3,972.0	1,077.1	1,207.0	170.8	60.0	17,654.7	210,106.0	8.4%	622.94	3,141.00	76,638.72	303,008	32.36%	
LINCOLN	30,992.9	5,054.9	2,868.2	496.5	55.2	0.0	39,467.7	278,292.0	14.2%	1,271.63	8,476.00	56,597.53	351,283	30.12%	
LYON	11,756.6	3,030.1	4,485.1	1,075.1	164.2	18.0	20,529.1	387,950.0	5.3%	1,889.36	9,524.00	50,051.46	462,067	17.75%	

OTHER DATA

COUNTY	CRP		CONTINUOUS		CREP		RIM		RIM		TOTAL		CROPLAND		PERCENT		USF&W		COUNTY			
	ACRES	CRP ACRES	ACRES	CRP ACRES	ACRES	ACRES	WRP	WRP	WRP	WRP	ACRES	RESOURCE	ACRES	ACRES	ENROLLED	EASE./ACQ.	DNR	NATURAL	LANDS	SIZE TOTAL	PERCENT	HABITAT
MCLEOD	1,754.4	2,379.9	860.8	647.2	130.3	131.0	5,903.6	255,423.0	2.3%	1,690.93	2,709.00	49,528.53	323,347	18.50%								
MAHNOMEN	22,070.8	1,842.5	0.0	0.0	0.0	0.0	23,913.3	160,028.8	14.9%	10,654.33	10,142.00	173,641.03	373,523	58.46%								
MARSHALL	196,229.5	3,140.5	0.0	422.9	118.4	6,096.0	206,007.1	806,892.8	25.5%	61,032.50	114,496.00	162,476.13	1,161,043	46.86%								
MARTIN	1,295.4	994.0	4,467.0	655.8	95.9	0.0	7,508.1	411,001.0	1.8%	342.54	2,547.00	40,349.53	466,598	10.88%								
MEEKER	14,632.6	2,652.6	0.0	1,538.1	108.7	151.0	19,083.0	277,071.1	6.9%	7,087.13	2,657.00	97,949.56	412,467	30.74%								
MILLE LACS	313.1	429.2	0.0	295.4	0.0	0.0	1,037.7	86,682.7	1.2%	0.00	36,590.00	351,037.11	435,718	89.30%								
MORRISON	4,651.5	1,958.1	0.0	871.6	0.0	0.0	7,481.2	237,828.8	3.1%	1,688.00	5,615.00	473,856.00	737,760	66.23%								
MOWER	394.0	4,134.2	0.0	808.1	495.8	306.0	6,138.1	381,563.5	1.6%	0.00	1,603.00	36,649.41	454,995	9.76%								
MURRAY	13,994.6	6,303.4	2,615.8	572.6	0.0	0.0	23,486.4	388,780.0	6.0%	2,179.1	866.100	51,783.6	460,659	18.69%								
NICOLLET	1,331.6	2,246.8	1,107.0	1,798.9	105.4	1,363.0	7,952.7	234,169.0	3.4%	0.00	4,392.00	30,002.82	298,528	20.88%								
NOBLES	1,897.7	5,077.0	0.0	224.0	0.0	0.0	7,198.7	399,175.8	1.8%	547.65	3,712.00	37,156.93	462,630	10.31%								
NORMAN	49,015.4	4,256.0	0.0	1,115.7	0.0	0.0	54,387.1	481,471.4	11.3%	1,120.00	6,189.00	69,504.73	561,574	23.36%								
NORMAN	10,725.8	737.7	0.0	201.3	47.9	0.0	11,712.7	253,019.3	4.6%	0.00	3,231.00	144,748.20	418,726	38.14%								
OTTER TAIL	68,800.6	14,626.1	708.5	850.4	95.4	790.0	85,871.0	630,658.7	13.6%	35,424.10	11,681.00	671,501.26	1,423,923	56.50%								
PENNINGTON	76,056.5	1,311.6	0.0	38.0	0.0	0.0	77,606.1	302,391.9	25.7%	0.00	3,229.00	72,944.25	395,629	38.87%								
PINE	101.4	169.2	0.0	0.0	0.0	0.0	270.6	129,121.2	0.2%	2,045.00	2,888.00	865,829.04	917,133	94.97%								
PIPESTONE	8,050.5	4,629.9	217.3	401.1	0.0	0.0	13,298.8	242,801.0	5.5%	0.00	2,101.00	46,686.5	298,515.0	20.80%								
POLK	147,139.7	8,533.2	0.0	304.4	0.0	10,418.0	166,395.3	1,000,145.9	16.6%	16,575.09	21,198.00	209,856.84	1,279,437	32.36%								
POPE	30,473.6	5,815.6	4,950.9	2,456.7	389.1	255.0	44,340.9	285,591.0	15.5%	21,884.19	3,136.00	139,293.11	438,938	45.46%								
RAMSEY	0.0	0.0	0.0	0.0	0.0	0.0	5,934.7	0.0	0.0%	154.00	0.00	34,195.69	108,730.70	31.59%								
RED LAKE	46,403.3	471.9	0.0	232.9	0.0	5.0	47,113.1	205,985.9	22.9%	0.00	2,264.00	52,791.09	277,184	36.86%								
REDWOOD	6,665.0	2,708.7	8,002.5	3,838.0	242.0	218.0	21,674.2	510,646.0	4.2%	0.00	4,966.00	36,978.53	564,173	11.28%								
RENVILLE	2,177.8	2,630.4	9,501.4	4,325.0	311.3	1,298.0	20,243.9	575,177.0	3.5%	1,496.03	1,234.00	41,403.04	631,718	10.19%								
RICE	14,228.6	1,715.4	0.0	1,060.9	202.3	27.0	17,234.2	224,642.0	7.7%	885.84	2,569.00	85,035.70	329,901	32.05%								
ROCK	521.4	1,799.3	0.0	464.5	0.0	0.0	2,785.2	257,380.9	1.1%	754.00	487.00	39,102.99	309,146	13.95%								
ROSEAU	125,418.3	13,658.2	0.0	34.0	0.0	593.0	139,703.5	549,220.0	25.4%	0.00	94,051.00	426,907.80	1,074,125	61.51%								
ST. LOUIS	30.0	111.1	0.0	0.0	0.0	0.0	141.1	61,532.8	0.2%	0.00	5,514.00	4,167,662.37	4,312,019	96.78%								
SCOTT	1,934.6	1,008.2	118.2	780.3	0.0	21.0	3,862.3	105,357.4	3.7%	4,531.21	1,768.00	97,926.31	235,501	45.90%								
SHERBURNE	840.5	677.8	0.0	0.0	0.0	51.0	1,569.3	93,107.0	1.7%	29,676.00	1,086.00	141,078.53	288,256	60.16%								
SIBLEY	1,583.0	1,577.8	908.5	1,260.8	13.3	30.0	5,373.4	323,296.0	1.7%	1,159.13	1,662.00	48,192.25	384,128	14.68%								
STEARNS	26,069.3	5,379.5	0.0	735.7	0.0	211.0	32,395.5	511,176.8	6.3%	11,163.42	5,027.00	311,027.11	889,248	40.44%								
STEELE	5,692.0	5,379.6	211.7	1,126.0	833.9	776.0	14,039.2	231,158.0	6.1%	630.11	1,650.00	31,655.94	276,467	17.35%								
STEVENS	8,140.8	7,105.6	790.5	1,160.9	0.0	656.0	17,833.8	315,465.0	5.7%	10,793.88	2,675.00	33,134.50	368,346	17.50%								
SWIFT	22,977.3	6,857.3	6,072.6	1,503.0	0.0	520.0	37,930.2	400,611.0	9.5%	9,466.99	9,363.00	53,333.56	481,440	22.87%								
TODD	14,534.2	1,589.7	0.0	55.8	38.5	0.0	16,218.2	272,395.9	6.0%	818.85	9,502.00	327,615.66	626,752	56.51%								
TRAVERSE	2,587.7	10,913.0	285.7	321.5	78.4	165.0	14,351.3	335,488.0	4.3%	5,549.16	1,209.00	27,978.27	375,277	13.08%								
WABASHA	10,284.2	500.7	0.0	777.2	0.0	0.0	11,562.1	183,650.9	6.3%	3,517.00	6,085.00	143,092.31	351,360	46.75%								
WADENA	2,101.2	2,417.1	0.0	218.8	0.0	0.0	4,737.1	113,085.2	4.2%	0.00	5,087.00	225,984.66	347,597	67.84%								
WASECA	3,685.8	3,641.5	1,926.6	723.0	95.0	71.0	10,142.9	235,099.0	4.3%	248.78	2,088.00	31,199.63	276,934	15.77%								
WASHINGTON	579.6	57.9	0.0	20.6	0.0	0.0	658.1	68,738.4	1.0%	0.00	1,873.00	151,304.34	270,637	56.84%								
WATONWAN	2,003.4	1,925.8	2,914.5	577.8	56.1	0.0	7,477.6	251,650.9	3.0%	225.07	1,284.00	20,738.17	281,242	10.58%								
WILKIN	12,897.0	3,184.4	0.0	443.6	0.0	1,465.0	17,990.0	407,405.0	4.4%	2,742.26	5,510.00	25,913.29	481,178	10.84%								
WINONA	9,024.9	906.5	0.0	354.5	10.1	0.0	10,296.0	186,347.5	5.5%	2,429.00	22,706.00	190,617.55	410,310	55.09%								
WRIGHT	5,555.6	1,157.8	0.0	674.4	0.0	79.0	7,466.8	220,989.5	3.4%	2,938.42	4,245.00	178,340.77	457,171	42.21%								
YELLOW MEDICINE	10,632.9	7,558.6	5,452.9	1,554.0	0.0	597.0	25,795.4	424,077.0	6.1%	1,194.67	5,087.00	49,211.98	488,646	16.64%								
STATE TOTAL	1,430,749.4	250,752.0	100,465.0	57,906.5	6,734.4	36,794.0	1,883,401.3	23,071,285.3	8.2%	452,708.12	1,115,981.20	28,109,739.20	53,993,362									

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Sources: CRP Acres: www.fsa.usda.gov/crpt07/Approved/risumyr/mn.htm (7/30/04)
 CREP Acres: http://www.bwsr.state.mn.us/easements/crp/easementssummary.html (7/31/03)
 WRP Acres: NRCS (8/16/04)
 Cropland Acres: FSA - 2001

Sources: (Continued)
 USF&W Easements: 2003 Annual Report
 DNR WMA: 2001 GIS Layer
 Natural Lands: 1990 MN Landuse - Forest, Wetland, Pasture, Water