

THE 2013-2023 POPE COUNTY WATER PLAN

~ WITH 2013-2018 IMPLEMENTATION PLAN ~



Weir Dam by Terrace Mill

On the Chippewa River

~ Photos by Anthony Hanson ~

SUBMITTED FOR FINAL STATE REVIEW

ON APRIL 12, 2013

*Prepared by the Pope County Water Plan Task Force
and Midwest Community Planning, LLC*

ACKNOWLEDGEMENTS

A special thanks is extended to the following individuals who were involved in the preparation and development of this document. Pope County greatly appreciates their participation!

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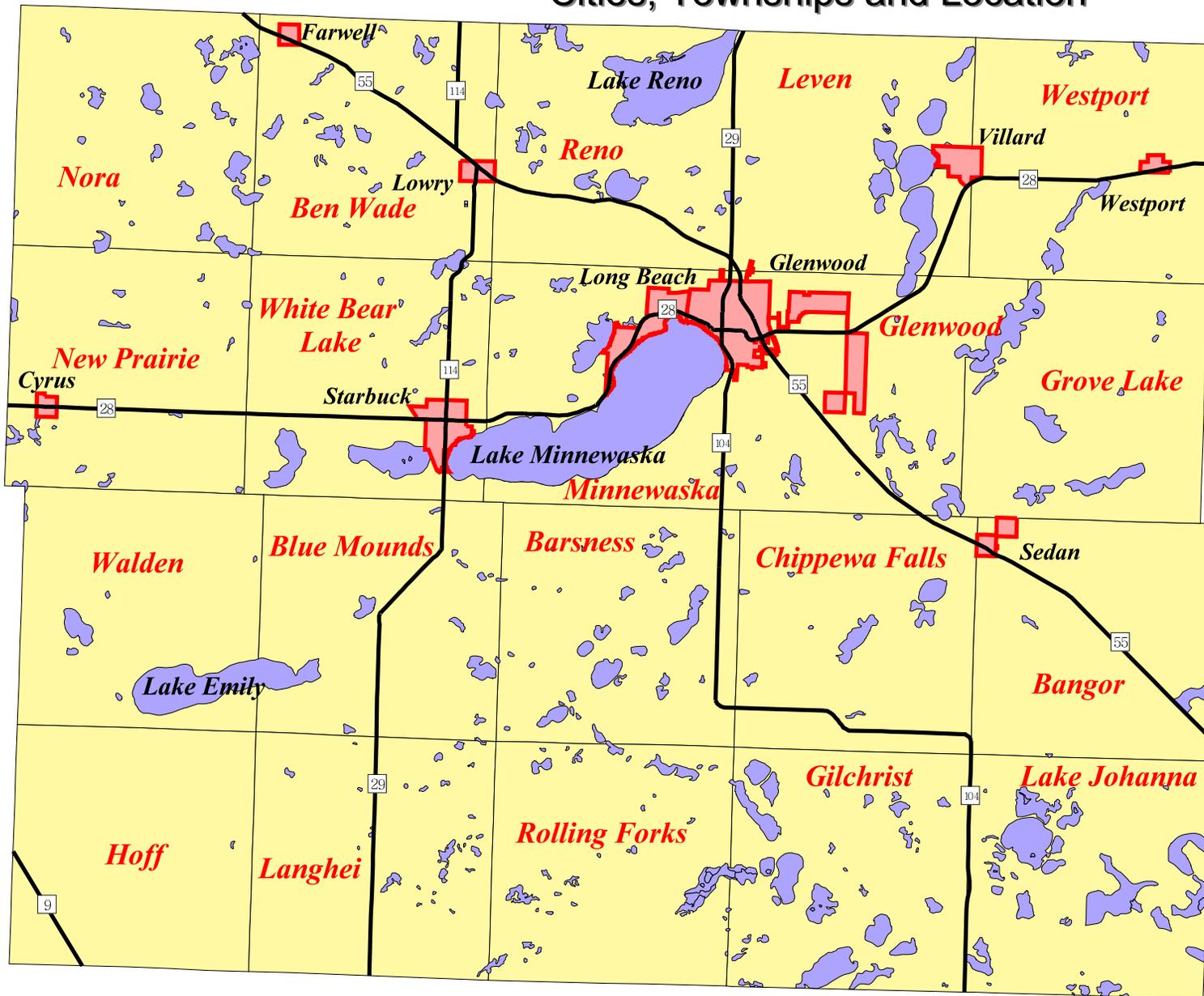
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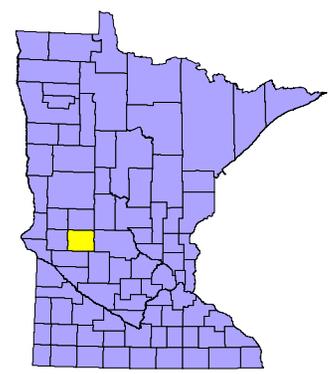
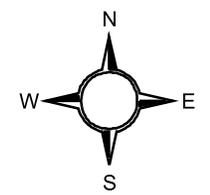
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Map 1A: Pope County's Cities, Townships and Location



Legend

-  Major Roads
-  Cities
-  Lakes
-  Townships



Pope County

Comprehensive Local Water Management Plan:

Executive Summary

The Pope County Water Plan follows the provisions set forth in Minnesota State Statutes 103B.314 - Contents of Water Plan.

A. Purpose of the Local Water Plan

According to Minnesota Statute 103B, each county is encouraged to develop and implement a local water management plan with the authority to:

- Prepare and adopt a local water management plan that meets the requirements of this section and section 103B.315;
- Review water and related land resources plans and official controls submitted by local units of government to assure consistency with the local water management plan; and
- Exercise any and all powers necessary to assure implementation of local water management plans.

Pursuant to the requirements of the law, the Pope County Water Plan:

- Covers the entire area of Pope 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
- Will serve as a 10-year water plan (2013-2023), with a 5-year implementation plan (2013-2018). In 2018, the implementation plan will be updated.

In addition, the Water Plan will also serve as the Pope County Soil and Water Conservation District's (SWCD) Comprehensive District Plan. This will need to be passed by the SWCD's Board of Supervisors by Resolution.

B. A Description of Pope County's Priority Concerns

Chapter Two provides a detailed assessment of the priority concerns. Based upon the Pope County Water Plan Survey, and comments received by the various water plan stakeholders, the Water Plan Task Force identified the following priority water planning issues (**note: these issues are not ranked**):

1. Reducing Priority Pollutants ~ Surface Water Quality
 - a. TMDL Implementation
 - b. Feedlot/Livestock Management
 - c. Subsurface Sewage Treatment Systems
 - d. Aquatic Invasive Species

2. Erosion and Sediment Control

3. Surface Water Management
 - a. Agricultural Drainage
 - b. Stormwater Management
 - c. Wetlands and Water Storage/Retention
 - d. Shoreland Management

4. Groundwater Quality & Quantity
 - a. Wellhead Protection Areas
 - b. Drinking Water Quality
 - c. Irrigation Management

5. Plan Administration
 - a. Watershed Focus
 - b. Stakeholder Cooperation
 - c. Raising Public Awareness

C. Summary of Goals, Objectives, Action Steps, and Estimated Costs

To address the priority concerns identified in the scoping process, the Pope County Water Plan Task Force held meetings to develop the five goal areas. These five goal areas are further broken down into interrelated objectives that address each of the priority concerns. Most importantly, each objective has a series of action steps designed to help achieve implementation of the identified goal.

A summary of the County's Water Plan Goals, Objectives and Action Steps is provided below. Collectively they form the Implementation Plan for the County. In addition, a summary of annual estimated costs is provided. These estimated expenses are separated into Overall Costs and Local Costs. Overall Costs include all monies spent by water plan stakeholders, including the County, watershed districts, state agencies, and landowners. The Local Costs include funds spent and activities performed by Pope County (including items such as the County's 103E administrative costs) and the Pope County SWCD. The Water Plan Task Force recognizes that not all of the identified Action Items will be accomplished over the course of the Water Plan's time-frame, however, the intent is to accomplish as many implementation activities as feasible. **Also keep in mind the costs identified are only estimates, and actual direct and/or indirect costs may be more or less than indicated.** Finally, many of the Action Items will be dependent upon receiving grants. Chapter Three contains the Water Plan's complete Goals, Objectives, and Action Steps, and Chapter Four provides additional details on administering the Water Plan.

Surface Water Quality Initiatives

The first goal area focuses on addressing surface water quality issues. Objectives were developed for TMDL implementation, feedlots, failing Subsurface Sewage Treatment Systems (SSTS), and Aquatic Invasive Species (AIS). In addition, Objective A was written to "Protect Pope County's surface waters from being listed on MPCA's 303d List of Impaired Waters." It was discussed throughout the planning process that it is both easier and more cost-effective to protect water quality than it is to restore waterbodies once they become impaired. Implementation steps under the first goal area include a wide range of the following surface water quality Best Management Practices (BMPs):

- Complete a full inventory of the ravines along the south shore of Lake Minnewaska. Survey and develop preliminary plans to repair and enhance the ravines. Target and implement twenty water quality BMPs.
- Reduce total phosphorus levels in the lakes identified in the Pope 8 Lake TMDL Plan by implementing water quality BMPs, including restoring wetlands, developing enhanced manure management plans, cost-sharing feedlot upgrades, and establishing vegetative buffers. Project-specific implementation activities were identified for each impaired subwatershed.

- Enroll 50% of cropland within impaired subwatersheds into nutrient management plans.
- Inspecting all SSTS in impaired subwatersheds and securing financial assistance programs to provide assistance for homeowners to upgrade 10 noncompliant SSTSs annually.
- Identify sites where cattle exclusions are needed and cost-share five (5) BMP projects.
- Partnering with the Chippewa River Watershed Project on implementing the Chippewa River TMDL Plan.
- Conducting core samples to pursue dredging the Mill Pond.
- Creating a local Aquatic Invasive Species (AIS) Task Force.

The various action steps identified to address the first goal area of surface water quality improvements in Pope County are estimated to have an overall 5-year cost of \$3,840,000. Of this amount, \$832,000 is estimated to come from the County, including direct and indirect (in-kind) SWCD estimated costs. These amounts reflect the high costs associated with removing waters from the 303d List of Impaired Waters. Many of these implementation activities will be eligible for grant funding.

Erosion and Sedimentation Control Initiatives

The second goal area is aimed at reducing erosion and controlling sedimentation. The specific objective is to “Work with landowner to identify priority sites to implement erosion and sediment control Best Management Practices.” Implementation steps include the following BMPs:

- Install 100 acres of vegetative buffer filter strips annually.
- Install three (2) water and sediment control structures annually.
- Install five (5) alternative tile intakes.
- Install 500 feet of living snow fences annually.
- Install five (5) streambank stabilization projects annually.
- Install five (5) water and sediment control basins annually in the Little Chippewa River subwatershed.
- Install five (5) water and sediment control basins annually in the Main Branch Chippewa River subwatershed.
- Implement twenty (20) BMP projects in the south shore Lake Minnewaska subwatershed.

- Secure funding to properly implement a grade stabilization project in Hoff Township less than one mile from the Chippewa River.
- Install one mile of vegetative filter buffer strips per year along Ashley Creek.

The various action steps identified to address the second goal area of erosion and sediment control improvements in Pope County are estimated to have an overall 5-year cost of \$969,000. Of this amount, \$151,000 is estimated to come from the County, including direct and indirect (in-kind) SWCD estimated costs.

Surface Water Management Initiatives

The third goal area is aimed at reducing managing surface water quantity issues, including separate objectives for agricultural drainage, stormwater management, wetlands/surface water retention, and shoreline restorations. Implementation steps include the following:

- Identify public and private tile lines that flow into the open ditch system.
- Install five (5) buffers and/or side inlets annually to control erosion and sedimentation and to maintain efficiency.
- Cost-share two (2) controlled drainage projects.
- Design and install a minimum of three (3) rain gardens annually.
- Promote the use of semi-permeable surfaces by creating two (2) demonstration sites.
- Assist with creating four (4) stormwater holding ponds.
- Apply for funds to develop a Stormwater Management Plan for the City of Starbuck.
- Partner with the City of Glenwood on implementing its Stormwater Management Plan.
- Restore two (2) wetlands annually.
- Target the impaired subwatersheds for wetland restorations.
- Increase the number of Wetland Reserve Program easements by two (2) each year by targeting marginal farmland.
- Examine alternatives to using rip-rap during shoreland restorations.
- Cost-share two (2) shoreland restorations annually.

The various action steps identified to address the third goal area of erosion surface water management issues in Pope County are estimated to have an overall 5-year cost of \$1,375,000. Of this amount, \$241,000 is estimated to come from the County, including direct and indirect (in-kind) SWCD estimated costs.

Groundwater Quantity and Quality Initiatives

The fourth goal area focuses on addressing groundwater quality and quantity issues. Objectives were developed for wellhead protection, drinking water quality, and groundwater quantity BMPs. Implementation steps include a wide range of the following groundwater Best Management Practices (BMPs):

- Target groundwater BMP Programs in Wellhead Protection Areas, such as RIM and CRP.
- Work with cities on mutually agreed upon ordinance language for Wellhead Protection Areas.
- Target sealing all abandoned wells in Wellhead Protection Area. Implement two (2) annually.
- Incorporate the County’s sensitive groundwater recharge areas map into to the local land use decision making process.
- Implement two (2) groundwater BMP projects annually.
- Seal four (4) abandoned wells annually.
- Cost-share converting conventional irrigation systems to conservation systems. Implement two (2) projects annually.
- Increase acres in Irrigation Management Program by 5,000 acres.

The various action steps identified to address the fourth goal area of groundwater quality and, quantity BMPs in Pope County are estimated to have an overall 5-year cost of \$418,500. Of this amount, \$95,500 is estimated to come from the County, including direct and indirect (in-kind) SWCD estimated costs.

Plan Administration Initiatives

The fifth goal area is aimed at effectively implementing the County’s Water Plan. The specific objective is to “Engage the Citizens and Stakeholders on key water planning issues and implementation opportunities.” Implementation steps include the following:

- Quarterly publish newsletters.
- Promote BMP programs in the newspaper a minimum of two times annually.
- Establish BMP demonstration/test sites.
- Annually host workshops on priority water planning issues.

- Annually promote BMP practices and available funding at the Pope County Fair.
- Annually apply for Clean Water Funds and similar funding mechanisms to implement Action Steps.
- Ensure the County is prepared to provide matching funds in order to qualify for BMP grants.

The various action steps identified to address the fifty goal area of effectively administering the Water Plan in Pope County are estimated to have an overall 5-year cost of \$85,000. Of this amount, \$60,000 is estimated to come from the County, including direct and indirect (in-kind) SWCD estimated costs.

Summary of Estimated Costs

The five water plan goal areas and their corresponding estimated costs are summarized below in Table 1. The initiatives identified in Chapter Three are estimated to cost approximately \$1,337,500 annually overall, with approximately \$276,000 coming from local/county funds.

**Table 1:
Summary of Pope County’s Water Plan
Estimated Overall and Local Costs**

	<i>Overall</i>	<i>Local/County</i>
Goal Area One: Surface Water Quality	\$3,840,000	\$832,000
Goal Area Two: Erosion & Sedimentation Control	\$969,000	\$151,500
Goal Area Three: Surface Water Management	\$1,375,000	\$241,000
Goal Area Four: Groundwater Quality & Quantity	\$418,500	\$95,500
Goal Area Five: Plan Administration	\$85,000	\$60,000
5-Year Estimated Costs	\$6,687,500	\$1,380,000
Average Annual Estimated Costs	\$1,337,500	\$276,000

These estimated expenses are separated into Overall Costs and Local Costs. The Local costs include funds spent and activities performed (i.e., in-kind expenses) by Pope County and the Pope County SWCD.

**Note:* Please refer to Chapters Three and Four for a more detailed description of the estimated overall costs and the estimated total local costs to Pope County and the Pope County SWCD. Expenses may seem exaggerated, but actually represent the numerous stakeholders involved and a collaboration of their corresponding activities and budgets.

D. Relationship to other Plans

The Pope County Water Plan Task Force includes a diverse group of people representing a number of key water plan stakeholders. Assistance from the Task Force in the planning process, along with information requested from Local Governmental Units, helped to ensure the Water Plan, and its corresponding Goals, Objectives and Action Steps, were developed to be consistent with existing plans and official land use controls. As a result, the updated Pope County Water Plan is believed to be consistent with the plans and official controls of the other pertinent local, State and regional plans and controls. In conclusion, there are no recommended amendments to other plans and official controls to achieve consistency with this Water Plan.

Chapter One:

Pope County Priority Concerns Scoping Document

Note: Chapter One was submitted as the Priority Concerns Scoping Document during the development of the Water Plan. It serves as Chapter One of the Water Plan to provide the reader with a better understanding of Pope County's Priority Water Planning Issues.

Section One:

Introduction to the Water Plan & Pope County

A. Water Plan Background

In 2003, Pope County updated its Comprehensive Local Water Plan, in accordance with Minnesota Statutes 103B. The Plan, which expires in May 2013, was approved by the Minnesota Board of Water and Soil Resources (BWSR) on May 28, 2003.

This Water Plan update process began on June 5, 2012, when the Pope County Board of Commissioners passed a resolution to amend the Pope County Comprehensive Water Management Plan. The new Water Plan will be a ten-year plan (2013 – 2023), with a five-year Implementation Plan (2013-2018). As a result, the Implementation Plan will need to be updated in 2018. The Pope County Land and Resource Management Department is responsible for administering the County's Water Plan.

According to Minnesota Statute 103B, each county is encouraged to develop and implement a local water management plan with the authority to:

- (1) Prepare and adopt a local water management plan that meets the requirements of this section and section 103B.315;
- (2) Review water and related land resources plans and official controls submitted by local units of government to assure consistency with the local water management plan; and
- (3) Exercise any and all powers necessary to assure implementation of local water management plans.

Pursuant to the requirements of the law, this Pope County Water Plan:

- Covers the entire area of Pope 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
- Will serve as a 10-year water plan (2013-2023), with a 5-year implementation plan (2013-2018). In 2018, the implementation plan (Chapter Three) will be updated.

B. Water Plan Accomplishments

Pope County has proven its dedication to the implementation of its Water Plan through the supportive actions of the Water Planning Task Force and Board of Commissioners. The Water Plan Task Force has utilized Natural Resources Block Grant funds to successfully accomplish numerous priorities in the Water Plan, including those activities listed on the following pages. In addition, the County created an Environmental Trust Fund in 2002. The Glacial Lakes Environmental Trust Fund, as it is officially named, is governed by the West Central Initiative Foundation, has an advisory committee, and was seeded in 2002 with \$350,000 from the County's general budget. The following lists some of Pope County's other Water Plan accomplishments:

2002

- Pope County Environmental Trust Fund is created with \$350,000 in general funds
- COLA lakes monitoring and testing continues
- Trapper's Run Phase I & II CWP projects
- City of Glenwood Stormwater Review Plan

2003

- Trapper's Run Feedlot Improvement Project
- Biotic community sampling on Lake Malmedah
- Numerous buffer-strips installed

2004

- Trapper's Run Sediment Removal Plan completed
- Glenwood and Starbuck sewage treatment repairs made
- City of Lowry Sanitary Service review
- Lake Leven Watershed/JD4 Restoration Plan begins

2005

- Environmentally friendly ordinances adopted regarding stormwater drainage
- Starbuck and Glenwood complete significant stormwater projects
- Minnewaska Sanitary Sewer discussions resurface
- SWCD newsletter continues to educate agricultural producers on conservation issues

2006

- Environmental Trust Fund is moved to the West Central Initiative Fund and grows
- Monitoring and testing for the Pope County COLA Lakes Association continues
- Minnewaska Area Planning efforts start
- City of Lowry Sewer Project Review is completed
- Villard Area Lakes Sanitary District begins sewer study

2007

- “Pocket Park” established in Glenwood demonstrating stormwater materials
- Feedlot educational seminar offered to producers promoting proper manure application
- Held public discussion on county-wide buffer initiative
- Actively worked with State on managing growing Curly Leaf Mill Pond weed infestation in area lakes
- 4 water/sediment control basins installed
- 1 shelter belt installs
- 1 Ag waste system installed

2008

- 6 water/sediment control basins installed
- Rain Garden demonstration project installed a Pope County Fair Grounds.
- Rain Garden workshop held to promote practice.

2009

- 2 water/sediment control basins installed
- 1 ag waste system installed
- Pope County 8 Lake TMDL study completed; Implementation Committee meetings held monthly
- 136 acres of prescribed grazing
- 709 acres of nutrient management
- 615 acres of irrigation water management
- 715 acres of residue management
- 69 acres of restored wetlands

2010

- 3 water/sediment control basins installed
- Land & Resource office sponsored shoreland management public meeting
- 2 Stormwater retention ponds installed in the City of Glenwood
- 180 acres of prescribed grazing
- 5 water and sediment basins
- 893 acres of irrigation water management
- 815 acres of residue management
- 87 acres of grass filter strips
- 41 acres of riparian buffers
- 15 acres of restored wetlands

2011

- 8 water/sediment control basins installed 2012
- City of Lowry upgraded sanitary sewer system
- Prescription Drug Collection Day sponsored by Land & Resource office
- 1,043 acres of prescribed grazing
- 495 acres of nutrient management
- 507 acres of irrigation water management
- 461 acres of residue management
- 2 feedlot runoff control projects
- 25 acres of grass filter strips
- 11 acres of riparian buffers
- 167 acres of restored wetlands

2012

- 2 water/sediment control basins installed
- 1 streambank & shoreline protection project completed
- 1 exclusion fence installed
- 1 grade stabilization structure/side inlet project completed
- 1 urban stormwater control project completed
- 1 Feedlot runoff control project
- City of Starbuck updated sanitary sewer system
- Lake Scandi shoreline stabilization demonstration project installed.
- Installed cluster system for Lake Amelia
- Environmental Trust Fund awarded Pope SWCD grant funds to provide 1 staff to identify and secure funding for BMPs in the 8 Lake TMDL target area.
- 300 acres of prescribed grazing
- 6 water and sediment basins
- 976 acres of nutrient management

- 739 acres of irrigation water management
- 142 acres of residue management
- 2 feedlot runoff control projects
- 24 acres of grass filter strips
- 184 acres of restored wetlands

2007-2012

- 76.6 acres of buffer strips installed
- 45.2 acres wetland buffers installed
- 127.4 acres filter strips installed
- 22.7 duck habitat installed
- Working Land Initiative promoted managed grazing on public lands. U.S. Fish & Wildlife grazed 6.4 WPAs and 480 acres from 2008-12.

Additional Accomplishments

- The Pope/Douglas Solid Waste Management office organized pesticide container pickup events to help ensure that hazardous pesticide waste does not contaminate water resources. The Extension Office also continued to produce informational and educational brochures relevant to the Water Plan.
- The Pope County Land and Resource Management office continued to provide water quality information, well water testing, and septic system and abandoned well educational services to area residents.
- Funding and clerical support was provided to the Pope County Coalition of Lakes Associations for various projects aimed at improving water quality. Volunteers logged countless hours to ensure the success of these projects.
- Pope County is a MPCA delegated partner with the State Feedlot Program and employs a County Feedlot Officer (CFO). The County has approximately 353 registered feedlots, with approximately 30 completed manure management plans.
- The Pope County Land and Resource Management office provided administrative/clerical support for the implementation of the Water Plan, which included the processing of invoices and performing all of the BWSR eLink reporting that is required for the program.

C. Pope County Profile

Pope County is located in west-central Minnesota, approximately 150 miles west of the Minneapolis-St. Paul Metropolitan Area. As Map 1A shows (placed after the Table of Contents), there are 9 cities and 20 townships within the County. The City of Glenwood is the County Seat of Pope County. The County shares borders with Douglas County to the north; Stearns County to the east; Kandiyohi and Swift Counties to the south, and Stevens County to the west.

According to the 2000 census, the County has a total area of 718 square miles, of which 670 square miles (or 93.43%) is land and 47 square miles (or 6.57%) is water. Map 2A shows there are three major watersheds in Pope County: Chippewa River, North Fork Crow River, and Sauk River Watersheds. Although the County has numerous lakes, Lake Minnewaska is the largest and provides shoreland for the cities of Glenwood, Starbuck, and Long Beach. Agricultural land is currently and will remain the dominant type of land use over the next 10 years.

Table 1 shows Pope County’s Census population since 1960, which is currently around 10,995 residents (2010 Census). Pope County overall has lost population since 1960, losing approximately 8% of its population. This trend is projected to continue over the next 10 years, which is common throughout rural Minnesota.

**Table 1:
Pope County’s Population since 1960***

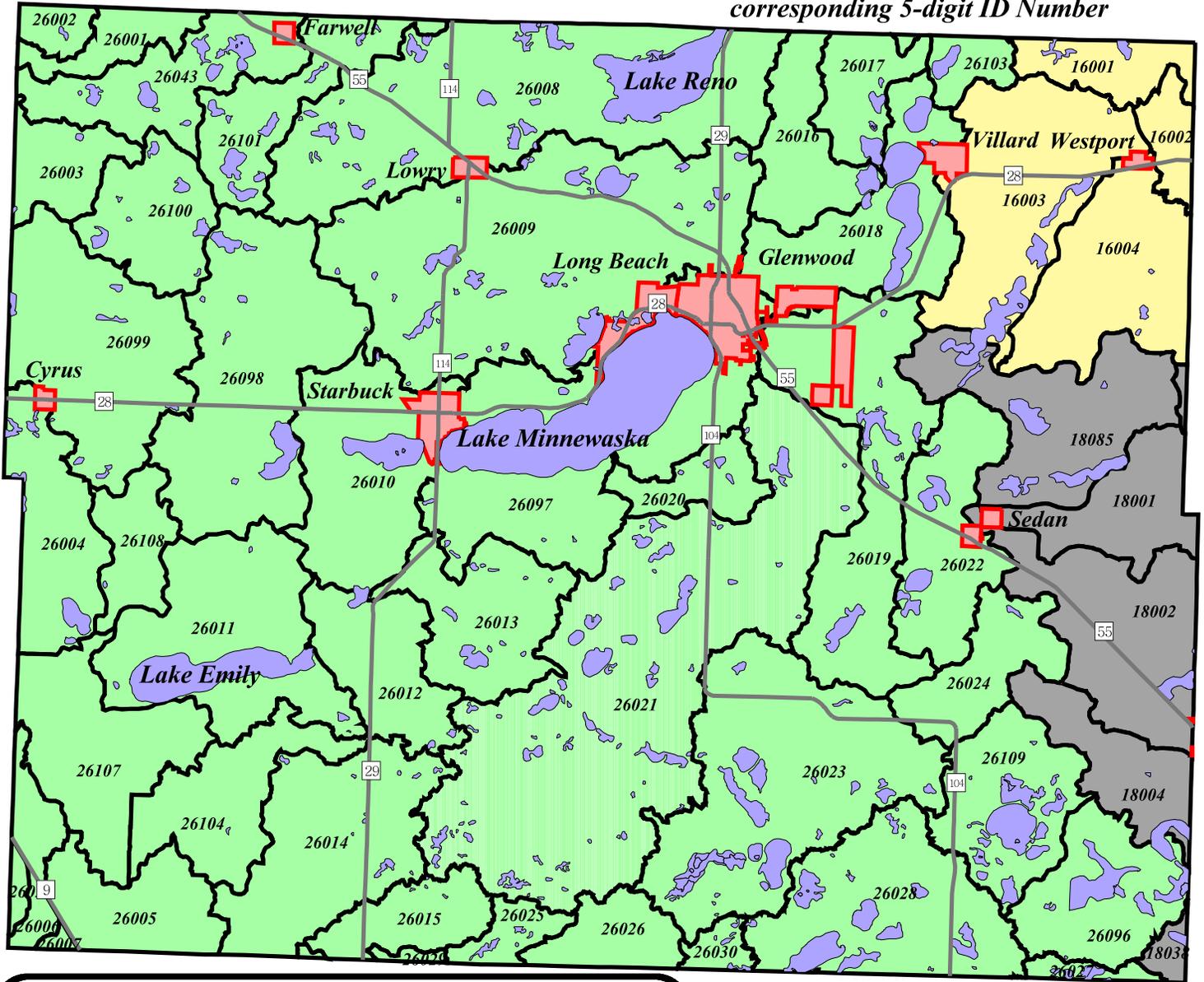
Area	Population	Change	
		#	%
1960	11,914	N/A	N/A
1970	11,107	-807	-6.8%
1980	11,657	550	5.0%
1990	10,745	-912	-7.8%
2000	11,236	491	4.6%
2010	10,995	-241	-2.1%
Totals since 1960		-919	-7.7%

**Source: U.S. Census*

Map 2A: Pope County's Major and Minor Watersheds

Note

Minor Watersheds are labeled with their corresponding 5-digit ID Number



Legend



Major Roads



Lakes



Cities

Watersheds



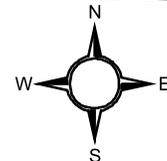
Chippewa River



North Fork Crow River



Sauk River



2 0 2 4 6 Miles



Section Two:
Priority Concerns Scoping
Document Planning Process

D. Resolution to Update the Pope County Water Plan

The first step in the Water Planning Process was for the Pope County Board of Commissioners to approve a resolution indicating the County was officially updating its Water Plan. This action took place on June 5, 2012, at the regularly scheduled County Board meeting. A copy of the resolution appears in Appendix A.

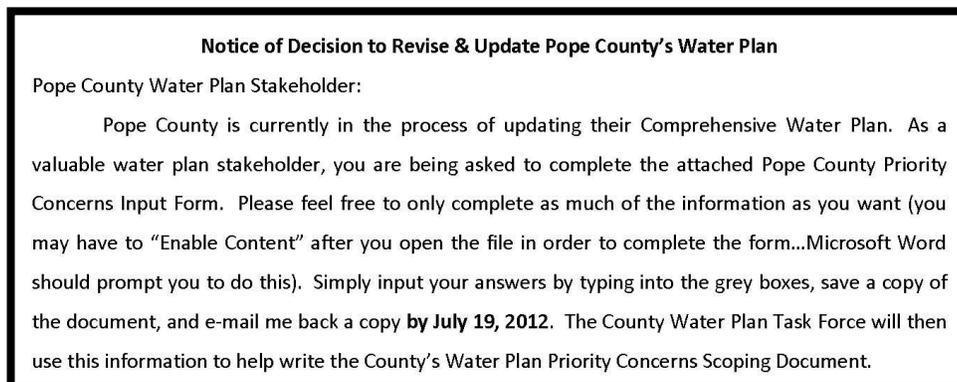
E. Notice of Plan Update

An official “Notice of Plan Update” for the Pope County Water Plan was sent on June 26, 2012, to the contacts as prescribed by Minnesota Statutes 103B (found by visiting... www.revisor.mn.gov/statutes) and according to the “Routing Information” contained on BWSR’s website under the Resource Management and Planning tab:

www.bwsr.state.mn.us/planning/routing.html

A copy of the Notice of Plan Update can be found in Appendix A.

Figure 1:
Notice of Plan Update
~ Found in Appendix A ~



F. Water Plan Survey Results

Pope County created a Pope County Comprehensive Local Water Management Survey in 2012. The survey was made available online through Survey Monkey, by visiting:

www.surveymonkey.com

In addition, a paper copy of the survey was also made available through the Pope County Land and Resource Management Office. Twenty-four people completed Pope County's Water Plan Survey. Appendix A contains a copy of the actual survey used.

The survey results are briefly summarized:

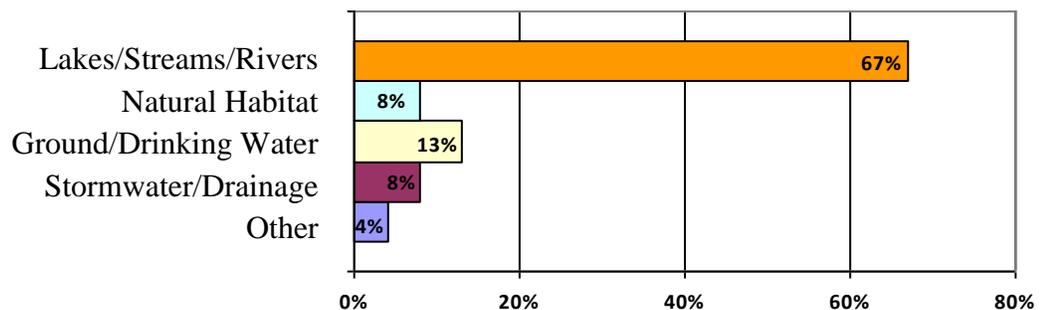
Figure 2:
Water Plan Online Survey
~ Found in Appendix A ~

The screenshot shows a survey question: "1. Which of the following resources needs to be protected or improved the most in Pope County? Please select one...". The options are: Ground/Drinking Water, Stormwater/Drainage Systems, Lakes/Streams/Rivers, Natural Habitat (i.e., prairie, wetlands, etc.), and Other. There is also a text box for "Other (please specify)".

Pope County Water Plan Survey Results Summary

Lakes, Streams, and River issues were the top priority concerns identified in Question 1, with Contaminated Runoff being the top issue identified in Question 2. Each question is presented with the results and any written comment made.

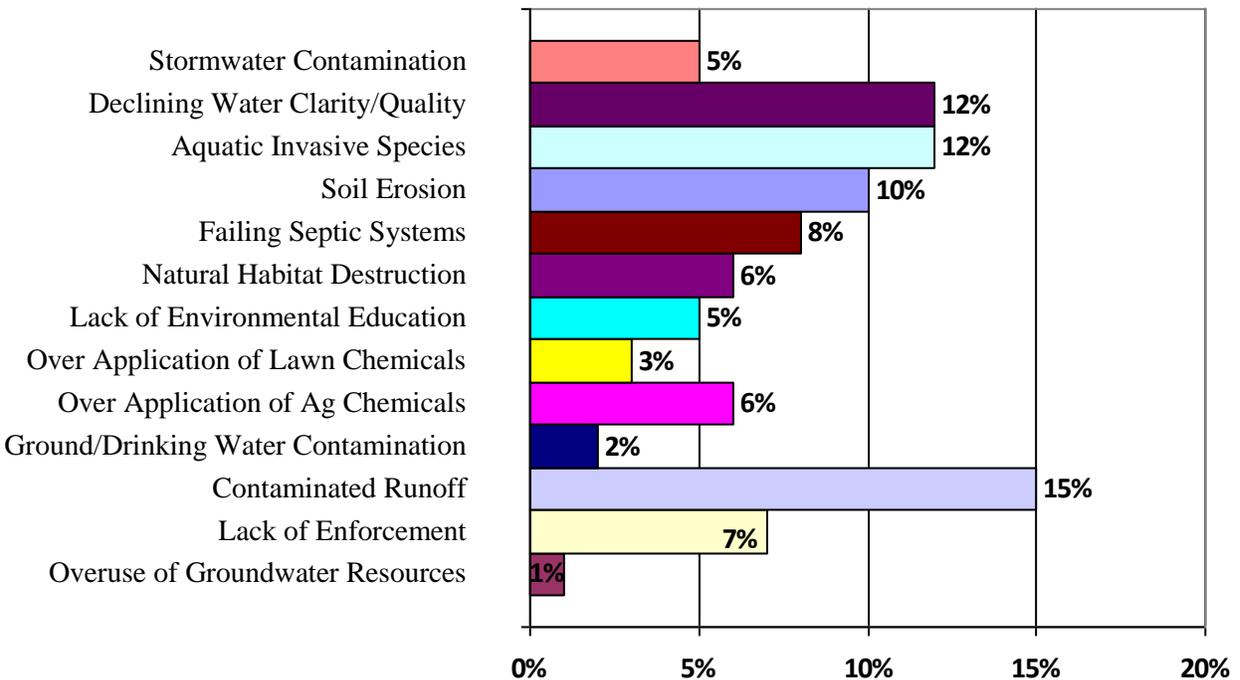
1. Overall, which of the following needs to be protected or improved the most in Pope County? Please select one...



Question 1 Other Comments:

- IMPAIRED WATERS PRIORITY PROGRAM NEEDS TO BE ESTABLISHED
- If we do a good job of protecting our natural habitats, then we will protect our groundwater and drinking water, decrease pressure on our stormwater/wastewater systems, and protect our lakes and rivers.
- The resource of private enterprise needs to be protected from over-regulation
- The economic impact of tourism showcasing our beautiful lakes

2. What are the top FIVE issues/threats to water resources in Pope County? Please select five issues...



Question 2 Other Comments:

- ALL COUNTY DEPARTMENTS NEED TO THINK OF HOW ACTIONS TAKEN BY THEM WILL NEGATIVELY IMPACT WATERS OF THE COUNTY AND TAKE REMEDIAL ACTION PRIOR TO THE ACTIVITY.

- I don't believe any farmer is interested in spending more money on chemicals than he has to but many won't use filter strips along streams and sloughs. Cabin owners insist on lawns down to lake despite education efforts.
- Not understanding in money flow that tourism brings to Glenwood and what we could do with this beautiful city.
- Changing lake levels

3. Please explain what can be done to assist with the issues/threats you identified.

- COUNTY NEEDS TO BE PROACTIVE IN EVERY ACTION IT TAKES WHEN IT COMES TO WATER ISSUES. COUNTY NEEDS TO CONSIDER THAT IT WILL TAKE 10 TO 30 YEARS TO SEE CORRECTIONS TO SOME WATER IMPAIRMENTS IN THE COUNTY AND STAFF THE PROBLEM ACCORDINGLY.
- Educate public on issues
- encourage grass buffers between water and cropland or urban runoff sites. Increase water storage on the landscape.
- REQUIRE FARMLAND TILING AND DRAINAGE TO APPLY BMP FOR TILE INTAKES, BUFFER STRIPS AND SEDIMENT CONTROL AND ENFORCE THE RULES
- minimize the sediment load that enters into lakes from surrounding agricultural fields. Support the Pope County TMDL implementation efforts. Provide Aquatic Invasive Species education to the community at lake accesses, events, ads, etc. Continue water quality monitoring through COLA. Enforce 50' buffer around water bodies.
- Education, education, education. Citizens need to realize that water is a limited resource and that we are all responsible for protecting it.
- Major change in the attitude of Government that they need to REGULATE every facet of private enterprize.
- Too many cows standing in streams, loss of CRP, County Board's negative attitude towards natural areas. Tougher regulations would help.

- Cities can take action to minimize the impact of storm water and contaminated run-off. Perhaps more bio-filters / reactors should be installed to remove impurities. There should be pro-active steps taken to limit aquatic invasive species from our lakes and rivers.
- Public education campaign explaining that what we put on our land ends up in our water; groundwater, lakes, rivers, streams and drainage ditches. This would include failing septic systems.
- Hire more county staff to work with other local/state/federal agencies to meet goals.
- Removal of milfoil and monitoring of septic systems.

4. What other water resource concerns do you have regarding Pope County?

- Most people do not seem concerned with these threatening issues of water impairment of our lakes, rivers and streams.
- eutrophication from excess nutrients
- PROTECT THE REMAINING WETLAND COMPLEXES AND SMALL LAKES FROM FURTHER ENCROACHMENT BY AG OPERATIONS. WORK TO RESTORE CRP AND OTHER GRASSLAND PRESERVATION PROGRAMS.
- Impaired Lakes in Pope County
- Lakeshore development -- we need to be stricter about what is allowed. Drainage (ag, commercial, residential): we need to hold more water on the land, 'make the water walk' (not run), to protect our surface waters. Mow less area -- plant more large areas (especially in town) to native plantings so filter water and provide habitat (and decrease mowing time and expense).
- More tiling and ditching is only going to lead to another disaster with high water that happened last year. Although many programs to protect waterways are open to farmers, they have a mindset to drain and overgraze. Education doesn't seem to have much effect.
- I am concerned that the water resource be protected but there needs to be a balance. Over regulation can be just as harmful to our quality of life.
- Municipal stormwater and sanitary sewer lines that need repair, updating to handle current system demands, and/or replacement.

- Drain tiles adding to increased lake water levels.
- Water quality would be at the top of my list. Our lakes are a vital draw for the economic growth of this county, we all need to promote clean, clear water. Control erosion, phosphorus, pollution in general. Create storm water basins to filter out sediment. The entire county, meaning all jurisdictions working together, to control these issues.
- Wetland losses, corn/soybean cropping and related erosion/pollution issues, groundwater mining.
- Maintaining a good water level in Lake Minnewaska

G. State & Local Stakeholder Comments

At the beginning of Pope County’s water planning process, the County’s key water planning stakeholders were asked to submit comments on priority water planning issues and suggested implementation activities. This was accomplished by completing either a Pope County Priority Concerns Input Form, or by simply submitting a letter. The following stakeholders submitted comments:

- The Minnesota Department of Agriculture
- The Minnesota Pollution Control Agency
- The Minnesota Board of Water and Soil Resources
- The Minnesota Department of Natural Resources
- The Chippewa River Watershed Project
- The Sauk River Watershed District

Table 2 summarizes the priority concerns identified by each of the stakeholders. The “Survey” column in Table 2 combines the response from Pope County Water Plan Survey. ***Based upon the stakeholders comments received, Pope County’s top three priority issues are:***

- 1) **Surface Water Quality – Impaired Waters**
- 2) **Surface Water Management - Drainage/Stormwater/Wetlands/Water Retention**
- 3) **Groundwater Quality/Quantity**

Minnesota Department of Agriculture (MDA)

The MDA submitted a Priority Concerns Input Form for Pope County. A copy of the email, dated July 27, 2012, is contained in Appendix B. The MDA's identified the following five priority water planning concerns:

1. Agricultural Drainage, Wetlands and Water Retention
2. Groundwater and Surface Water Protection: Agricultural Chemicals and Nutrients/Water Use/Land Management in Wellhead Protection Areas
3. Manure Management and Livestock Issues
4. Agricultural Land Management
5. Targeting of BMPs, Aligning Local Plans and Engaging Agriculture

The MDA also created a webpage which communicates and profiles their top five priority water planning concerns. The webpage provides links to each of the five priority concern areas, including information on why the issue is important, what actions need to be taken, and links to more information on the subject. For more information, please visit the following MDA link:

www.mda.state.mn.us/protecting/waterprotection/waterplanning.aspx

Minnesota Pollution Control Agency (MPCA)

The MPCA submitted a letter outlining their top three priority concerns for Pope County. A copy of the map and letter, dated August 7, 2012, can be found in Appendix B. The MPCA submitted the following two priority concerns for Pope County:

1. Impaired Waters/Total Maximum Daily Loads (TMDL)
2. Feedlot Compliance – Finding/Fixing Problems (Inspections)

Minnesota Board of Water and Soil Resources (BWSR)

The BWSR submitted a Pope County Priority Concerns Input Form on July 19, 2012 (a copy of the correspondence can be found in Appendix B). BWSR identified the following four top priority concerns:

1. Lake Minnewaska and other lakes not currently listed as Impaired (other than for Mercury) with organized lake associations.
2. Lakes Leven, Gilchrist, Reno, Ann, Malmedal, Strandness, Pelican, and Emily listed as Impaired (other than for Mercury).
3. Chippewa River
4. Groundwater Quality Protection and Improvement

Minnesota Department of Natural Resources (DNR)

The Minnesota Department of Natural Resources, Division of Fish and Wildlife/Fisheries submitted a Priority Concerns Input Form for Pope County. A copy of the email, dated August 1, 2012, is contained in Appendix B. The MDA's identified the following five priority water planning concerns:

1. Stormwater Runoff
2. Groundwater Protection and Conservation
3. Water Plan Administration and Organizational Efficiency

Chippewa River Watershed Project

The Chippewa River Watershed Project submitted a Priority Concerns Input Form which can be found in Appendix B. Based upon the information submitted, the Watershed Project identified the following three priority concerns:

1. Surface Water Quality
2. Water Quantity
3. Soil Erosion

Sauk River Watershed District

The Sauk River Watershed District submitted a Priority Concerns Input Form on October 12, 2012, which can be found in Appendix B. Based upon the information submitted, the Watershed Project identified the following three priority concerns:

1. Ashley Creek Watershed
2. West Port Lake
3. County Ditch 6

**Table 2: Pope County Water Plan
Summary of Stakeholder’s Priority Concerns**
(Please refer the letters submitted in Appendix B for a more accurate description)

Priority Concern/Issue	Stakeholder					
	<i>*Stakeholder’s Top Priority Concern</i>					
	BWSR	Dept. of Ag	MPCA	DNR	Chippewa R.	Sauk River
2. Wetlands/Water Retention		Yes*			Yes	
2. Drainage/Stormwater		Yes*		Yes*	Yes	Yes
1. Surface Water Quality	*Yes	Yes	Yes	Yes	Yes*	Yes
Soil Erosion/Sediment Control		Yes			Yes	
Feedlots/Nutrient Management		Yes	Yes			
Septic Systems (SSTS)						
3. Groundwater quality/quantity	Yes	Yes		Yes	Yes	
Best Management Practices		Yes				
1. Impaired Waters	Yes	Yes	Yes*		Yes	Yes
Watershed Approach	Yes				Yes	*Yes
Water Plan Administration				Yes		

** = Stakeholder’s Top Priority Concern*

1-3 = County’s overall top three priority concerns based upon all stakeholder’s feedback. Some categories were combined.

**Section Three:
Pope County
Priority Water Planning Issues**

H. Water Plan Task Force

Pope County maintains a Water Plan Task Force which meets regularly on water plan initiatives (the members are listed on the inside cover of this document). In addition, the Task Force is used throughout the water planning process to help identify priority issues and to develop the water plan's Goals, Objectives, and Action Steps.

I. Priority Water Planning Issues

The Pope County Water Plan Task Force met on November 29, 2012, to review the Water Plan Survey results and the Priority Concerns Input Forms received. Based upon the survey results and the comments received in the Priority Concerns Input Forms, the Water Plan Task Force identified the following as Pope County's priority water planning issues (note: these issues are not ranked):

1. Reducing Priority Pollutants ~ Surface Water Quality
 - a. TMDL Implementation
 - b. Feedlot/Livestock Management
 - c. Subsurface Sewage Treatment Systems
 - d. Aquatic Invasive Species

2. Erosion and Sediment Control

3. Surface Water Management
 - a. Agricultural Drainage
 - b. Stormwater Management
 - c. Wetlands and Water Storage/Retention
 - d. Shoreland Management

4. Groundwater Quality & Quantity
 - a. Wellhead Protection Areas
 - b. Drinking Water Quality
 - c. Irrigation Management

5. Plan Administration
 - a. Watershed Focus
 - b. Stakeholder Cooperation
 - c. Raising Public Awareness

J. Priority Issues Not Addressed by this Water Plan

All of the priority issues identified in the Pope County Water Plan Survey and received in Pope County's Priority Concerns Input Forms, will either directly or indirectly be addressed in Pope County's updated Water Plan. This is particularly important to Pope County, since BWSR and the other State agencies have indicated that projects are less likely to receive grant money unless they are mentioned in Local Water Management Plans.

As a result of not excluding any priority concern identified by a water plan stakeholder, Pope County does not anticipate needing to resolve any differences between Pope County's Priority Water Plan Issues and other state, local and regional concerns.

Section Four: Pope County Ongoing Water Plan Activities

Pope County has numerous ongoing programs and land use controls that are directly linked to the County's Water Plan. These ongoing activities include educational efforts on key water planning issues, stream monitoring, and Best Management Practices (BMPs) implementation. In addition, County staff regularly attends water management meetings, educational conferences, and promotes water protection projects, including the Chippewa River Watershed Project. The County also annually provides cost-share to fund various watershed groups and similar organizations, such as the North Fork Crow River and Sauk River Watershed Districts. All of these activities directly are related to implementing the Local Water Management Program (i.e., "Water Plan").

In addition to implementing the County's Water Plan, the County also accomplishes numerous water plan initiatives through implementing the following County programs. **Table 3 shows that Pope County has spent over \$665,475 in funds on all of these ongoing activities between the five-year period of 2007 and 2011.**

- ***County Feedlot Program*** – Pope County has a county feedlot program, administered through the Minnesota Pollution Control Agency (MPCA). As a result, the county works with producers on registration, permitting, inspections, education, and follow-up on complaints.
- ***Subsurface Sewage Treatment System (Program SSTS)*** – Pope County enforces MN Rules Chapter 7080-7083 through the Pope County SSTS Ordinance. This Ordinance helps ensure that septic systems are designed and maintained properly, and includes a compliance inspection requirement when property is transferred (seller's responsibility).
- ***Shoreland Management Program*** – Pope County assists the Minnesota Department of Natural Resources (DNR) with administering the Shoreland Management Act. This Act regulates land use development within 1,000 feet of a lake and 300 feet of a river and its designated floodplain.
- ***Wetland Conservation Act Program (WCA)*** – Pope County assist the Minnesota Board of Water and Soil Resources (BWSR) with administering the Minnesota Wetland Conservation Act of 1991. The goals of the Act are to maintain a "no-net-loss of wetlands", minimize any impacts on wetlands, and to replace any lost wetland acres affected by development.

**Table 3:
Pope County's
Natural Resource Block Grant Expenditures
~ 2007 – 2011 ~**

Year - Category	2007		2008		2009		2010		2011		5-Year Totals		
	State	Match	Overall										
Feedlot¹	\$32,998	\$23,099	\$35,588	\$23,450	\$35,768	\$24,184	\$31,658	\$22,160	\$29,743	\$22,818	\$165,755	\$115,711	\$281,466
SSTS²	\$9,885	\$0	\$10,000	\$0	\$10,000	\$0	\$9,931	\$0	\$9,529	\$0	\$49,345	\$0	\$49,345
LWM³	\$19,874	\$3,874	\$19,874	\$3,851	\$19,874	\$3,875	\$20,669	\$4,051	\$14,841	\$4,141	\$95,132	\$19,792	\$114,924
Shoreland⁴	\$4,842	\$4,842	\$4,842	\$4,842	\$4,842	\$4,842	\$4,842	\$4,842	\$4,179	\$4,179	\$23,547	\$23,547	\$47,094
WCA⁵	\$17,751	\$17,751	\$17,751	\$17,751	\$17,751	\$17,751	\$17,751	\$17,751	\$15,319	\$15,319	\$86,323	\$86,323	\$172,646
Sub-Total	\$85,350	\$49,566	\$88,055	\$49,894	\$88,235	\$50,652	\$84,851	\$48,804	\$73,611	\$46,457	\$420,102	\$245,373	\$665,475
Totals	\$134,916		\$137,949		\$138,887		\$133,655		\$120,068		\$665,475		

Feedlot¹ – Refers to the County's Feedlot Program

SSTS² – Refers to the County's Subsurface Sewage Treatment Systems Program

LWM³ – Refers to the County's Local Water Management Program

Shoreland⁴ – Refers to the County's Shoreland Program

WCA⁵ – Refers to the County's Wetland Conservation Act Program

Chapter Two: Assessment of Priority Concerns

This Chapter provides an assessment of the priority concerns identified in the County's Priority Concerns Scoping Document (which is Chapter One of this Water Plan). The County's official Water Plan Priority Scoping Document was reviewed and approved by the Board of Water and Soil Resources (BWSR) North Region Water Plan Committee on January 9, 2013, and the full BWSR Board on January 30, 2013. A copy of BWSR's acceptance letter is contained at the end of Appendix B.

The priority concerns scoping process identified numerous priority issues that can be categorized into five larger topic areas; Surface Water Quality (Reducing Priority Pollutants); Erosion and Sediment Control; Surface Water Management (Quantity); Groundwater Quality & Quantity; and Plan Administration. The Task Force acknowledges the priority issues could've been organized differently and that some priority issues pertain to more than one of the larger topic areas. This Chapter provides assessments for the first four categories. The fifth category, Plan Administration, is profiled in Chapter Four. As a result, this Chapter contains assessments on the following four water resource topics:

1. Surface Water Quality ~ Reducing Priority Pollutants
 - A. Surface Water Assessment
 - B. TMDL Implementation Assessment
 - C. Feedlot/Livestock Management Assessment
 - D. Subsurface Sewage Treatment Systems Assessment
 - E. Aquatic Invasive Species Assessment
2. Erosion and Sediment Control
 - F. Erosion and Sedimentation Assessment
3. Surface Water Management ~ Quantity
 - G. Agricultural Drainage Assessment
 - H. Stormwater Management Assessment
 - I. Wetlands and Water Storage/Retention Assessment
 - J. Shoreland Management Assessment
4. Groundwater Quality & Quantity
 - K. Wellhead Protection Assessment
 - L. Drinking Water Quality Assessment
 - M. Irrigation Management

Section One:

Surface Water Quality ~ Reducing Priority Pollutants

This section of the Water Plan provides an assessment of Pope County's surface water quality. To begin with, a brief profile of Pope County's watersheds is provided. Following are subsections on Surface Water Quality; Total Maximum Daily Load (TMDL) Implementation; Feedlots and Livestock Management; Subsurface Sewage Treatment Systems; and Aquatic Invasive Species.

Pope County's Watersheds

Pope County is divided into three major watersheds (refer to Map 2A on page 1-9): the Chippewa River Watershed, the North Fork Crow River Watershed, and the Sauk River Watersheds. Each of these watersheds is briefly profiled.

Chippewa River Watershed

The Chippewa River Watershed is the largest of Pope County's three major watersheds, covering approximately 88% of the County. The Chippewa River is one of 13 major tributaries of the Minnesota River. In total, the Chippewa River Watershed drains a 2,080 square mile, 1,331,200 acre basin, including portions of Otter Tail, Grant, Douglas, Stevens, Pope, Swift, Kandiyohi, Chippewa, and Stearns Counties.

The Watershed is served by the Chippewa River Watershed Project, which is a non-regulatory cooperative partnership and citizen based approach focused on improving water quality and watershed life in the Chippewa River and its tributaries. The CRWP is currently funded with state Clean Water Partnership Grants, Federal 319 Grant Dollars, and local water plan contributions. The CRWP also relies heavily on the volunteers and stakeholder participation. In 2011, Pope County joined the Chippewa River Watershed Project Joint Powers Board. For more information, visit http://www.chippewariver.com/about_proj.aspx.

North Fork Crow River Watershed

The North Fork Crow River Watershed covers approximately 8% of eastern Pope County. The headwaters of the North Fork Crow River are at Grove Lake in Pope County. The river flows relatively straight until it reaches northeast of Brooten, where it then begins to meander until it reaches the outlet of Lake Koronis in Meeker County. The North Fork Crow River Watershed District is located in Pope, Stearns, Kandiyohi, and Meeker Counties (www.nfcrwd.org/). The Watershed District is the drainage authority over JD-1, which is shared between Pope and Stearns Counties. The District also has a septic certification initiative that was started several

years ago when district residents in the Lake Koronis and Rice Lake areas approached the District with a request that inspections be conducted around their lakes. After much discussion, the NFCRWD board of managers determined the pollution reduction potential of a septic certification project would benefit the entire district. A joint powers agreement has been signed by all four counties in the district, allowing an inspector housed in Stearns County to work in other counties as well. As a result, maintaining JD-1 and ensuring that septic systems are installed and maintained properly are the watershed's two main priorities.

Sauk River Watershed

The Sauk River Watershed covers approximately 5% of northeastern Pope County. The largest water plan stakeholder in the watershed is the Sauk River Watershed District (www.srwdmn.org/index.html). The Cities of Villard and Westport are both located within the Sauk River Watershed District, and the minor sub watershed referred to as "Sauk Lake" sub watershed. The District does not have any monitoring sites located with Pope County.

The Watershed District's Incentive Program offers cost share funding (grant dollars) and State Revolving Loan Funds (SRF) low interest loans for Best Management Practice (BMPs) projects implemented within the Sauk River Watershed District. Two of the main areas of focus providing cost-share to construct ag-waste facilities and to purchase conservation equipment. The District also has money available to assist with constructing rain gardens and for establishing vegetative buffers.

A. Surface Water Quality Assessment

This section briefly profiles some of Pope County's surface water quality data. It is good public policy to protect what we have rather than to only focus water planning on restoration efforts. This is not only cheaper over time, but it is also largely perceived by the public as "the right thing to do." Board of Water and Soil Resources (BWSR) Conservationist Pete Waller summarizes this perspective by writing:

"Maintaining good water quality within non-impaired lakes is sound public policy (more effective and efficient to maintain than restore). Lakes are a reflection of their watersheds. Only local governments (county, cities, SWCD & WD's) working in conjunction with landowners can influence the impact of the watershed impact on lakes' water quality (July 19, 2012 ~ found in Appendix B).

Pope County Coalition of Lakes (COLA)

The Pope County Coalition of Lakes formed in 1993 and have been monitoring water quality in most of the County's major lakes since 1994. According to the COLA's website (<http://www.minnesotawaters.org/group/pccola/welcome>):

The Pope County COLA monitoring project, which started in 1994, covers sixteen lakes with seventeen sample sites. Due to State budget deficits, funds were not available to the County, in 2003, from the Board of Water and Soil Resource. Consequently Chlorophyll A was not sampled in 2003. However, total phosphorus is generally the nutrient most closely related to chlorophyll a production and weed growth, when nutrients are the limiting factor. Thus, these two parameters are expected to vary in unison. Likewise, the amount of Chlorophyll A should be directly related to the depth of light penetration, which is measured by Secchi disc. Therefore, the Secchi disc and chlorophyll a data should show similar trends.

This is not the case in some of our lakes. Secchi disc readings can be misleading, because suspended sediments, highly colored water, and very clear water affect transparency. Unfortunately, other unsampled factors are frequently related to seasonal and year-to-year variation. Spring (May) and early summer (June) chlorophyll a densities, high total phosphorus concentrations, and low Secchi disc readings are usually related to the amount of spring run-off and/or inflow. Many additional factors could be sampled in the future, if funds become available.

Algal blooms and reduced transparency can change the character and recreational use of our lakes. Such changes are related to excess nutrient and sediment loading due to human activities in the watershed. The Minnesota Pollution Control Agency (MPCA) uses a lake's summer average total phosphorus (TP) to determine whether lakes meet swimmable use. Our lakes are classified as:

- (1) full support: TP = under 30 parts per billion (ppb),
- (2) support threatened: TP = 30 - 40 ppb,
- (3) partial support: TP = 40 - 60 ppb,
- (4) non-support: TP = over 60 ppb.

Nuisance algal blooms are associated with total phosphorus concentrations greater than 30 ppb, in our region. Remember, 30 ppb equals one teaspoon of TP in 48,880 gallons of water or a pool 10 by 20 by 30 feet. In addition, one pound of TP will produce 500 pounds of weeds. Swimmable use during the summer season is related to the frequency and duration of these conditions. The results are displayed in the Table on the following page.

POPE COUNTY COLA MONITORING PROGRAM
Summer (June-September) average total phosphorus (parts per billion), 1994-2008.

Swim- able Use support	Lake Name	2008	2007	2006	2006	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	All Years
		Ave Total Phosphorus ppb : Rank															
FS	Signalness	17.5 : 1	16.5 : 2	28.5 : 9	14.8 : 2	28.3 : 3	25.0 : 3	30.5 : 7	24.3 : 4	24.7 : 5							23.3 : 3
FS	Maple	20.3 : 2	16.3 : 1	20.0 : 1	12.5 : 1	22.0 : 1	17.8 : 1	18.2 : 1	15.8 : 1	14.7 : 1	14.7 : 1	13.8 : 1	14.2 : 1	13.4 : 1	16.8 : 1	20.7 : 1	16.8 : 1
FS	Amelia	22.0 : 3	19.8 : 3	20.0 : 1	20.2 : 3	24.0 : 2	20.7 : 2	23.2 : 2	18.8 : 2	18.5 : 2	22.8 : 2	18.6 : 2	18.4 : 3	14.8 : 2	18.8 : 2	34.2 : 4	21.0 : 2
FS	Minnewaska-E	26.2 : 4	25.2 : 5	27.0 : 5	23.6 : 5	30.2 : 5	31.2 : 8	26.2 : 3	34.5 : 8	28.7 : 7	41.2 : 8	41.4 : 8	23.0 : 4	27.8 : 6	33.8 : 6	34.5 : 5	30.3 : 6
FS	Linka	26.5 : 5	26.7 : 7	34.5 : 8	23.8 : 6	33.0 : 6	26.3 : 4	28.2 : 5	23.0 : 3	22.7 : 3	23.6 : 3	25.2 : 4	26.4 : 5	24.6 : 4	33.3 : 5	26.2 : 2	27.0 : 5
FS	Minnewaska-W	27.8 : 6	28.2 : 6	26.8 : 4	26.8 : 7	29.2 : 4	29.7 : 6	32.2 : 8	33.2 : 6	26.3 : 6	40.8 : 7	39.6 : 7	31.2 : 8	27.0 : 5	27.8 : 4	33.2 : 3	30.5 : 7
FS	Scandinavian	29.0 : 7	21.7 : 4	21.8 : 3	21.3 : 4	38.2 : 9	30.5 : 7	26.3 : 4	26.2 : 5	23.2 : 4	27.2 : 4	22.4 : 3	17.8 : 2	19.0 : 3	25.5 : 3	34.7 : 6	25.6 : 4
ST	Grove	35.6 : 8	32.5 : 8	27.8 : 6	38.0 : 9	38.0 : 8	27.8 : 6	28.8 : 6	41.7 : 9	82.5 : 11	31.8 : 5	31.4 : 5	29.8 : 7	25.4 : 7	46.0 : 9	45.9 : 7	35.6 : 8
PS	Villard	40.5 : 9	52.7 : 12	45.0 : 10	53.7 : 11	34.8 : 7	47.3 : 9	52.2 : 10	45.8 : 10	35.5 : 6	43.5 : 9	33.6 : 6	28.6 : 6	33.0 : 6	36.8 : 7	84.3 : 11	44.5 : 9
PS	Pelican	42.2 : 10	48.3 : 10	34.5 : 9	48.6 : 10	72.0 : 12	70.2 : 12	58.5 : 11	61.7 : 13	51.0 : 9	48.0 : 10	67.0 : 12	49.0 : 12	52.4 : 11	49.3 : 10	46.5 : 8	53.3 : 11
PS	Reno	48.4 : 11	52.0 : 11	92.8 : 13	30.5 : 8	67.5 : 11	48.0 : 10	40.2 : 9	41.2 : 6	69.2 : 12	40.4 : 8	43.8 : 9	41.0 : 9	42.8 : 9	38.0 : 8	59.7 : 9	50.2 : 10
PS	Leven	46.8 : 12	44.2 : 8	52.8 : 11	58.2 : 13	44.8 : 10	64.5 : 11	70.3 : 12	51.0 : 11	51.8 : 10	50.5 : 11	43.8 : 10	43.4 : 10	47.8 : 10	53.8 : 11	105.0 : 12	56.2 : 12
PS	Gichrist	54.4 : 13	69.8 : 13	61.0 : 12	55.4 : 12	75.7 : 13	83.3 : 13	70.6 : 13	53.0 : 12	75.0 : 14	63.5 : 12	64.8 : 11	51.0 : 11	59.6 : 12	61.0 : 12	71.4 : 10	64.6 : 13
NS	Westport	78.6 : 14	88.5 : 15														83.55 : 15
NS	Emily	79.5 : 15	164.8 : 17	135.6 : 14	95.3 : 14	96.5 : 14	84.7 : 14	108.8 : 16	112.5 : 15	73.2 : 13	114.0 : 14	92.0 : 14	105.2 : 14	111.6 : 13	99.5 : 13	135.5 : 13	107.2 : 17
NS	Mainedahl	81.0 : 16	178.0 : 18	164.3 : 15	151.7 : 16	164.5 : 16	197.0 : 18	107.2 : 15	184.2 : 16	131.6 : 15	221.2 : 15	170.4 : 15	144.8 : 15	143.4 : 14	171.0 : 15	174.3 : 15	159.0 : 18
NS	Johanna	82.5 : 17	81.2 : 14														81.85 : 14
NS	Strandness	94.4 : 18	112.3 : 16	154.3 : 16	110.2 : 15	128.4 : 15	154.3 : 15	71.8 : 14	81.8 : 14	127.2 : 16	105.6 : 13	88.8 : 13	91.4 : 13	177.2 : 15	118.3 : 14	136.7 : 14	116.8 : 16
NS	Ann	324.8 : 19	202.8 : 19	248.2 : 17	272.5 : 17	335.9 : 17	341.5 : 17	346.8 : 17	478.6 : 17		268.2 : 16						313.2 : 19

ppb = parts per billion

Pope County COLA Monitoring data,
tabulated by: Bruce A. Brown

Key to Swimmable Use Support in North Central Hardwood Forests Ecoregion

FS= Full-support <30 parts per billion total phosphorus

ST= Support-threatened 30-40 parts per billion total phosphorus

PS= Partial-support 40-60 parts per billion total phosphorus

NS= Non-support >60 parts per billion total phosphorus

Based on "Lake Prioritization for Protecting Swimmable Use" MPCA October 1997

Table 1.-Summer(June-Sept)average total phosphorus (parts/billion) arranged by swimmable use support in North Central Hardwood Forests Ecoregion, 1994-08.

The Pope County COLA monitoring results reveal a lot about the quality of the lakes throughout Pope County. To begin with, the Table is organized ranking the lakes and test sites from 1-19, with the best water quality results on top. For example, Signalness Lake which is ranked #1 since it has the best water quality scores, while Ann Lake ranks the worst with a ranking of #19. Although the next Section of this Water Plan introduces the County's Impaired Waters, all of the lakes found on the MPCA's 303d List of Impaired Waters are ranked the lowest in the Table.

There is more water quality data introduced throughout this Chapter in each of the Priority Concerns Assessments, however, the Chippewa River Watershed also has completed a profile of their water quality results. In addition, the text box on the following page introduces some of the water quality planning issues for Lake Minnewaska.

The Chippewa River Watershed has been monitored by the Chippewa River Watershed Project since 1998 (<http://www.chippewariver.com/>). The watershed is divided into six sub-watersheds, including the Upper Chippewa; Middle Chippewa; East Branch; Lower Chippewa, Shakopee Creek and Dry Weather Creek. The Middle Chippewa and the East Branch cover most of Pope County. Each of these two sub-watershed's implementation needs are briefly profiled based upon information provided in the Chippewa River Watershed Monitoring Summary 2009-2010 (***Chippewa River Watershed Project***).

Middle Chippewa River Sub-Watershed – According to the Monitoring Summary, this basin's main pollutants are sediment, volatile solids, phosphorous, turbidity, transparency, and e-coli. Livestock exclusions to the Little Chippewa River would greatly cut down on turbidity and volatile solids. In addition, removing gullies and establishing buffers would also help reduce field erosion. In 2009 and 2010, the Watershed Project conducted a watershed wide survey of the stability of ditch and stream banks. Test sites in the Middle Chippewa River Sub-Watershed scored the poorest. As a result, bank and stream stabilization methods should also be a water plan priority.

East Branch Sub-Watershed – According to the Monitoring Summary, the East Branch's main pollutants is e-coli, with some localized issues in phosphorous and turbidity. Targeting livestock manure and non-complaint septic systems is the main focus, along with implementing agricultural Best Management Practices (BMPs) to mitigate fertilizer issues. The East Branch would also greatly benefit from stream bank stabilization.

Lake Minnewaska

One of Pope County's and West Central Minnesota's largest water resource assets, Lake Minnewaska, is located in the Chippewa River Watershed. Lake Minnewaska covers 8,050 acres and has a maximum depth of 32 feet, making it the 13th largest lake in Minnesota based upon number of acres (not water volume). The cities of Glenwood, Long Beach, and Starbuck share shorelines with the Lake. Numerous cabins and homes dominate the shoreline.



Fishing on Lake Minnewaska
Photo by Anthony Hanson of Glenwood

Although Lake Minnewaska has fortunately avoided being listed on the MPCA's list of Impaired Waters (refer to Section B of this Chapter), the Pope County Water Plan Task Force would like to proactively keep it that way. One of the lake's main water planning issues addressing stormwater issues stemming from the City of Glenwood.

City of Glenwood – The 2010 Census reported approximately 2,564 people living in 1,185 households in Glenwood. The City spans approximately 6 square miles of steeply sloping land adjacent to Lake Minnewaska. As a result, stormwater issues are a key water planning issue. 2010 Clean water funds are being utilized to address eroding ravines and untreated runoff entering Lake Minnewaska. The ravines originate from a 24" culvert that runs under Highway 55. The worst of the erosion in this area has been in the last ten years and the ravines now measure up to 20' deep and 30' wide and have uprooted trees, rocks and other debris. Installation of riparian cover and check dams in the two ravines will decrease further erosion and reduce suspended sediment during high flow events entering Lake Minnewaska. Several projects are designed to eliminate the direct discharge of untreated runoff flowing from impervious (hard) surfaces to the lake. All promote the water being absorbed into the ground before reaching the water table that corresponds to the lake level. Originally, a 50' X 490' parking lot at City Beach on the shoreline of Lake Minnewaska was planned to be removed to decrease the direct flow of stormwater entering Lake Minnewaska. In addition, three rain gardens with plants native to Pope County were planned. Overall, this project is anticipated to keep an estimated 400,000 gallons of stormwater filled with debris and various pollutants from directly entering Lake Minnewaska each year. The cost of relocating the parking lot at City Beach was much higher than the initial estimates, so the project was put on hold. During that time, high water, wind and wave action eroded the shoreline along Lake Minnewaska. The City requested moving the money from the parking lot project to restoring the lakeshore. BWSR agreed that this was a more imminent problem and would significantly reduce the amount of sediment entering Lake Minnewaska. The adjusted Shoreline Restoration Project resulted in saving 77 T/Yr sediment, 77 T/yr soil and 65.45 lbs/year phosphorus from entering Lake Minnewaska.

B. TMDL Implementation Assessment

Why is TMDL Implementation a Priority Concern? - A TMDL is an acronym for Total Maximum Daily Load (TMDL), which is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. The Federal Clean Water Act requires states to adopt water quality standards to protect the nation's waters. These standards define how much of a pollutant can be in a surface and/or groundwater while still allowing it to meet its designated uses, such as for drinking water, fishing, swimming, irrigation or industrial purposes. When a water body cannot meet its designated uses due to pollution, it is considered an Impaired Water.

The Minnesota Pollution Control Agency (MPCA) produces a List of Minnesota's Impaired Waters every two years, referred to as the 303d List of Impaired Waters. The List identifies impaired water bodies and identifies the types of pollutants that exceed the State's minimum water quality standards, ranging from high Mercury levels, to Turbidity (suspended solids), to Fecal Coliform (bacteria). Once a water body is placed on the 303d List of Impaired Waters, a TMDL Plan is developed which profiles the problem and identifies potential solutions (implantation strategies) to properly address the pollution sources. For more information on TMDLs, please visit the following MPCA website and search for "Impaired Waters/TMDLs:"

<http://www.pca.state.mn.us/index.php>

Where in the County is it a Priority Concern? – Appendix B contains the letter submitted by the MPCA during the process to identify Pope County's Priority Concerns. The letter contains the 303d List of Impaired Waters for Pope County, which identifies four impaired river/ditches and 16 impaired lakes. Table 2A reproduces the 303d List of Impaired Waters for Pope County. In the Table, the Impaired Use column refers to impairments classified by Aquatic Recreation, Aquatic Life, and Aquatic Consumption, while the Impairment Cause column lists the known pollutant. The last column in the Table refers to if a TMDL Plan has been developed for the impaired water. It should be noted that all lakes that have been identified as being impaired with high mercury levels were addressed in Minnesota's "*Statewide Mercury TMDL Plan.*"

Ashley Creek is an important water resource to Sauk Lake and the Sauk River. It has been placed on the State's 303d List of Impaired Waters for low dissolved oxygen since 1998, for E.coli bacteria in 2010, and for Aquatic Macroinvertebrate Bioassessments and Fish Bioassessment in 2012. The 2009 Sauk Lake TMDL study identified Ashley Creek as a primary nutrient contributor to Sauk Lake, especially during snow melt and rain events.

**Table 2A: MPCA's 303d List of
Impaired Waters for Pope County (2012)**

Impaired Water	ID#	Impaired Use*	Impairment Cause	Status
Ashley Creek: Headwaters to Sauk Lake	07010202 -503	- Aq Rec	E. coli	TMDL Required
		- Aq Life	Dissolved Oxygen	TMDL Required
Chippewa River: Little Ch. R. to Unnamed Cr.	07020005 -504	- Aq Life	Turbidity	TMDL Required
		- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Chippewa River: Stowe Lake to Little Chippewa River	07020005 -503	- Aq Rec	Fecal Coliform	TMDL Approved
		- Aq Life	Turbidity	TMDL Required
		- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Chippewa River: Unnamed Creek to East Branch Chippewa River	07020005 -505	- Aq Life	Fish Bioassessments	TMDL Required
		- Aq Life	Fecal Coliform	TMDL Approved
		- Aq Rec	Turbidity	TMDL Required
		- Aq Cons	Mercury in Fish Tissue	TMDL Approved
County Ditch 6: Unnamed Creek to Ashley Cr.	07010202 -521	- Aq Life	Fish Bioassessments	TMDL Required
		- Aq Life	Aq Macroinvertebrate+	TMDL Approved
Little Chippewa River: Unnamed Creek to Chippewa River	07020005 -530	- Aq Rec	E. coli	TMDL Required
		- Aq Life	Fish Bioassessments	TMDL Required
		- Aq Life	Turbidity	TMDL Required
Lake Ameila	61-0064-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Ann	61-0122-00	- Aq Rec	Excess Nutrients	TMDL Required
Danielson Slough	61-0194-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Edwards	61-0106-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Emily	61-0180-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Gilchrist	61-0072-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Grove	61-0023-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Hanson	61-0080-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Irgens	61-0211-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Johanna	61-0006-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake John	61-0123-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Jorgenson	61-0164-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Leven	61-0066-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Malmedal	61-0162-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Mary	61-0099-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake McIver	61-0199-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Minnewaska	61-0130-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Pelican	61-0111-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Rasmuson	61-0086-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Reno	61-0078-00	- Aq Rec, Cons	Excess Nutrients, Mercury	TMDL Required
Lake Scandinavian	61-0041-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Signalness	61-0149-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Simon	61-0034-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Steenerson	61-0095-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Strandness	61-0128-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Swenoda	61-0051-00	- Aq Rec	Excess Nutrients	TMDL Required
Trappers Wetland	61-0522-00	- Aq Life	Aq Macroinvertebrate+	TMDL Required
Lake Villard	61-0067-00	- Aq Cons	Mercury in Fish Tissue	TMDL Approved
Lake Westport	61-0029-00	- Aq Rec	Excess Nutrients	TMDL Required
Lake Wicklund	61-0204-00	- Aq Rec	Excess Nutrients	TMDL Required

* Aquatic Recreation, Life, and Consumption

+ Aquatic Macroinvertebrate Bioassessments

Pope 8 Lakes TMDL

Eight of the lakes identified in the 303d List of Impair Waters for Pope County have been profiled in a TMDL Study, referred to as the *Pope 8 Lakes TMDL*. Excess nutrients (total phosphorus) levels were identified as the main pollutant. Table 2B lists the lakes included in the Pope 8 Lakes TMDL. All of the 8 lakes are located within the Chippewa River Watershed, a tributary of the Minnesota River.

**Table 2B:
Pope County Impaired Lakes
Included in the Pope 8 Lake TMDL**

Lake Name	Lake ID	Year Listed	Target TMDL Start/Completion
Ann	61-0122-00	2006	2014/2018
Emily	61-0180-00	2002	2012/2015
Gilchrist	61-0072-00	2002	2012/2015
Leven	61-0066-00	2002	2012/2015
Malmedal	61-0162-00	2002	2012/2015
Pelican	61-0111-00	2002	2012/2015
Reno	61-0078-00	2002	2012/2015
Strandness	61-0128-00	2006	2014/2018

What would happen if the Priority Concern was not addressed? - By definition, being listed as an impaired water for a pollutant means the water body cannot sustain itself naturally. As a result, collaborative measures need to be taken in order to give the water body a chance to become healthy again.

What needs to be done to properly address the TMDL Implementation in Pope County? The *Pope 8 Lake TMDL* identifies a vast amount of information on each of the 8 lakes included in the study. Although the entire document can be viewed online, the highlights are briefly summarized for each lake. To view the TMDL, visit the following MPCA website:

<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/tmdl-projects/minnesota-river-basin-tmdl/project-pope-county-8-lakes-excess-nutrients.html>

Ann Lake

Ann Lake is located northwest of the City of Glenwood in north central Pope County. The lake is 365 acres in size with approximately a 4,882 acre watershed area draining to the lake. It is estimated that Ann Lake receives between 12,295 and 13,776 pounds of phosphorus annually from external and internal sources combined, with the land application of manure being identified as the main potential pollution source. Lake restoration activities can be grouped into two main categories: those practices aimed at reducing external nutrient loads, and those practices aimed at reducing internal loads. A reduction of 10,929 pounds of total phosphorus annually is needed to achieve the Ann Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$200,000 - \$450,000 over the next 20-30 years (that amount does not take into account existing plans and programs).

What needs to be done for Ann Lake? The Pope 8 Lake TMDL identifies using the expansion of existing programs to encourage and promote agricultural BMPs, such as conservation tillage, alternative tile inlets, and buffers. Enhanced feedlot BMPs and nutrient management plans will need to be developed and implemented. Wetland restoration can also be used to provide water quality treatment in the watershed.

Lake Emily

Lake Emily is located approximately ten miles southwest of the City of Starbuck in southwest Pope County, Minnesota. The lake is 2,262 acres in size with an east-west orientation, with an inlet coming from Outlet Creek on the east end of the lake and an outlet on the west end referred to as Lake Emily Outlet Creek. In the early 1900s, County Ditch #2 was created and connected the Little Chippewa River with Outlet Creek. This increased the size of Lake Emily's watershed from approximately 150 square miles to over 200 square miles. It is estimated that Lake Emily receives 18,270 pounds of phosphorus annually from external sources within the entire watershed. The majority of the external phosphorus to Lake Emily is coming from the direct drainage area, the loading from the Little Chippewa River, and the loading from Lake Minnewaska. Internal loading accounts for an additional 1,603 – 5,335 lbs/year of loading to the lake. A reduction of 6,415 pounds of total phosphorus annually is needed to achieve the Lake Emily TMDL and meet water quality standards. The total cost for implementation is estimated to be \$800,000 - \$2,500,000 over the next 20-30 years (implementation costs do not take into account existing programs).

What needs to be done for Lake Emily? In addition to promoting agricultural and feedlot BMPs, the *Pope 8 Lake TMDL* identifies pursuing water quality BMPs, such as rain gardens, permeable pavements, and other low impact techniques near developed areas. The following list of suggested implementation steps should also be considered to assist with Lake Emily's restoration efforts:

- Wetland and stream restoration also has the ability to provide water quality and habitat improvements within the watershed. Priority wetland restoration sites will be identified within the TMDL implementation plan. The Starbuck Swamp offers a significant restoration opportunity;
- An emphasis on protecting and improving the water quality in Lake Minnewaska will serve to protect Lake Emily from future degradation due to development and land use activities within the Minnewaska watershed. A watershed management plan should be developed and implemented;
- The Little Chippewa River should be further considered for a partial diversion back to the river's original channel, which will effectively cut off a large portion of the watershed draining to Lake Emily;
- A lake drawdown could achieve many objectives including controlling the rough fish populations, consolidating the bottom sediments, creating an environment for macrophyte establishment, and potentially controlling curlyleaf pondweed in the lake.

Gilchrist Lake

Gilchrist Lake is 324 acres in size and located along the East Branch of the Chippewa River near Gilchrist Township. The main inlet to Gilchrist Lake is the East Branch of the Chippewa River on the northwest side of the lake. Gilchrist outlets on the south end of the lake to the East Branch Chippewa River, which then flows south into Swift County and eventually discharges into the Chippewa River. The watershed to Gilchrist Lake is approximately 72,098 acres and includes the East Branch of the Chippewa River and the drainage area to the Villard Chain of Lakes. It is estimated that Gilchrist Lake receives 8,434 pounds of phosphorus annually from external sources within the entire watershed. The majority of the external phosphorus to Gilchrist Lake is coming from the direct drainage stormwater runoff, loading from Amelia, and feedlots not requiring NPDES permit coverage. A reduction of 4,071 pounds of total phosphorus annually is needed to achieve the Gilchrist Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$400,000 - \$600,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Gilchrist Lake? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Gilchrist Lake:

- Expansion of existing programs to encourage and promote agricultural BMPs;

- Enhanced feedlot BMPs and nutrient management plans;
- Small and large scale water quality BMPs including ponds, rain gardens, permeable pavements, and other low impact techniques in developed areas;
- Water quality ordinances could also be used to strengthen existing protection measures during development;
- Wetland and stream restoration has the ability to provide water quality and habitat improvements within the watershed;
- An evaluation of existing mill ponds along the East Branch of the Chippewa River should be conducted to determine their role in water quality within the river and downstream receiving waters;
- Lake Amelia, Marlu Lake, Round Lake, Linka Lake, and Lake Swenoda also contribute phosphorus loading to Gilchrist Lake. BMPs enhancing these lakes will correspondingly help Gilchrist Lake;
- Lake Swenoda should be considered a high-priority lake for water quality BMPs.

Lake Leven

Lake Leven, along with Villard Lake and Amelia Lake, make up the Villard Area chain of lakes near the City of Villard in northeastern Pope County. This set of lakes serves as the headwaters to the East Branch of the Chippewa River. Lake Leven is 281 acres in size and is the northernmost lake of the chain. The watershed draining to Lake Leven includes drainage to Lake Ellen and Judicial Ditch 4 (JD4) within Douglas and Pope Counties. It is estimated that Lake Leven receives 2,396 pounds of phosphorus annually from external sources. The majority of the external phosphorus to Lake Leven is coming from stormwater runoff and feedlots not requiring NPDES permit coverage. A reduction of 836 pounds of total phosphorus annually is needed to achieve the Lake Leven TMDL and meet water quality standards. The total cost for implementation is estimated to be \$400,000 - \$600,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Lake Leven? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Lake Leven:

- Expansion of existing programs to encourage and promote agricultural BMPs;

- Enhanced feedlot BMPs and nutrient management plans;
- Wetland restoration has the ability to provide water quality and habitat improvements within the watershed;
- Due to the predominance of the Judicial Ditch 4 (JD4) system within the Leven watershed, emphasis should be placed on restoring and enhancing this ditch to provide water quality improvements through the use of alternative ditch designs (two stage ditches), wetland restoration, streambank stabilization, cattle exclusion, and buffers;
- Groundwater contributions to JD4 should be evaluated, as existing data suggest that groundwater phosphorus concentrations are high. Phosphorus within groundwater is typically a result of fertilizer and waste management practices coupled with sandy soils. The East Lateral of JD4 downstream of West Ellen Lake has exhibited very high dissolved phosphorus concentrations and should be a focus of investigation to determine the source;
- Monitoring of water quality parameters within West Ellen Lake will provide additional data to understand the potential impact of West Ellen and JD4. Monitoring at several locations along JD4 will also help to identify needed implementation activities.

Malmedal Lake

Malmedal Lake, 197 acres in size, is located in north central Pope County. Malmedal outlets to People's wetland, a 303(d) listed impaired wetland that drains to Strandness Lake and Trapper's Run Creek. Trapper's Run Creek flows through Pelican Lake and discharges to Lake Minnewaska. It is estimated that Malmedal Lake receives 1,467 pounds of phosphorus annually from external sources. The majority of the external phosphorus to Malmedal Lake is coming from stormwater runoff. A reduction of 1,052 pounds of total phosphorus annually is needed to achieve the Malmedal Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$250,000 - \$500,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Malmedal Lake? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Malmedal Lake:

- Expansion of existing programs to encourage and promote agricultural BMPs;

- Enhanced feedlot BMPs and nutrient management plans;
- Small and large scale water quality BMPs including ponds, rain gardens, permeable pavements, and other low impact techniques in developed areas;
- Wetland restoration has the ability to provide water quality and habitat improvements within the watershed.

Pelican Lake

Pelican Lake is located along Trapper’s Run Creek in North Central Pope County. The creek stretches 6.0 miles, starting at Malmedal Lake, flows through Pelican, and discharges at Lake Minnewaska. The Trapper’s Run Creek watershed is highly tiled as recorded as part of the Trapper’s Run Project in 1996. Pelican Lake has a surface area of 511 acres and lies between Lake Minnewaska and Strandness Lake along the creek. It is estimated that Pelican Lake receives 2,580 pounds of phosphorus annually from external sources within the entire watershed. The majority of the external phosphorus to Pelican Lake is coming from runoff from the direct drainage area and the loading from Strandness Lake. A reduction of 911 pounds of total phosphorus annually is needed to achieve the Pelican Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$400,000 - \$800,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Pelican Lake? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Pelican Lake:

- Expansion of existing programs to encourage and promote and enhance agricultural and feedlot BMPs, including livestock exclusions along Trapper’s Run Creek;
- Wetland restoration has the ability to provide water quality and habitat improvements within the watershed;
- Improvements to the water quality in Strandness Lake upstream of Pelican will result in better water quality within Pelican;
- Shoreland BMPs and restoration activities around lake should be a high priority;
- Resources should be focused on upgrading existing septic systems to comply with current regulations and shared wastewater options should be explored.

Reno Lake

Reno Lake, the largest lake in this study, is located in north-central Pope County with a small portion crossing into Douglas County. Reno is located approximately ten miles south of the City of Alexandria, Minnesota, the largest city in Douglas County. Reno Lake has a surface area of 3,509 acres and outlets into Maple Lake to the north. It is estimated that Reno Lake receives 2,064 pounds of phosphorus annually from external sources. The majority of the external phosphorus to Reno Lake is coming from the watershed and atmospheric deposition. A reduction of 744 pounds of total phosphorus annually is needed to achieve the Reno Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$400,000 - \$800,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Reno Lake? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Reno Lake:

- Expansion of existing programs to encourage and promote agricultural BMPs;
- Enhanced feedlot BMPs and nutrient management plans;
- BMPs such as sediment and water control basins should be used to treat runoff entering the lake;
- Wetland, ditch, and stream restoration can also be used to provide water quality treatment in the watershed;
- The existing sewage treatment facilities on the lake should be inspected and evaluated to determine where upgrades are needed. Community wastewater facilities or larger scale decentralized wastewater treatment could be explored;
- Shoreland BMPs and restoration to natural conditions would contribute to improved water quality;
- An emphasis on protecting and improving the water quality in Maple Lake will serve to protect Reno Lake from future degradation. A watershed management plan should be developed and implemented for Maple Lake.

Strandness Lake

Strandness Lake is located along Trapper’s Run Creek in north central Pope County. The creek stretches 6.0 miles, starting at Malmedal Lake, flowing through Strandness and Pelican and discharging at Lake Minnewaska. Strandness Lake is 86 acres in size, with approximately 11,824 acres in its watershed. It is estimated that Strandness Lake receives 1,838.6 pounds of phosphorus annually from external sources within the direct drainage watershed. A reduction of 998.6 pounds of total phosphorus annually is needed to achieve the Strandness Lake TMDL and meet water quality standards. The total cost for implementation is estimated to be \$200,000 - \$300,000 over the next 20 to 30 years (not including existing plans and programs).

What needs to be done for Strandness Lake? The Pope 8 Lake TMDL identifies the following implementation strategies to improve Strandness Lake:

- Expansion of existing programs to encourage and promote agricultural BMPs;
- Enhanced feedlot BMPs and nutrient management plans;
- Wetland restoration has the ability to provide water quality and habitat improvements within the watershed;
- Achieving the TMDL for Malmedal will be critical to achieving the TMDL for Strandness Lake.

C. Feedlot/Livestock Management

Why are Feedlots and Livestock Management a Priority Concern? 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 were amended in 1974, 1978, and again in 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 in a non-shoreland area, or 10 or more animal units in a shoreland area, need to register with the MPCA. A shoreland area is within 300 feet from a stream or river, or within 1,000 feet from a lake.

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.

Why do Feedlots and Livestock Management Issues Pose a Risk? Feedlot and livestock environmental issues are primarily concerned with manure management. Specifically, bacteria, phosphorus, and nitrogen runoff from manure can lead to water quality problems if not managed properly. These nutrients contribute to nutrient impairments in our waterbodies. Bacteria contaminants can result in a public health risk and result in impairments of waterbodies for consumption and recreation. In addition, livestock intensive grazing can substantially increase erosion and sedimentation rates when vegetative cover is destroyed preventing filtration of runoff before entering waterbodies.

Where are Pope County’s Feedlots Located? Pope County is currently delegated to administer the MPCA feedlot program. The County has completed a Level I, II, and III Feedlot Inventory. The location of Pope County’s feedlots are distributed evenly throughout the County. The following information was submitted to the MPCA as part of the Pope County’s 2012 Annual County Feedlot Officer (CFO) Performance Credit Report:

**Pope County Feedlots
(2012 CFO Report)**

➤ <i>Feedlots registered in shoreland with 10 - 299 Animal Units (AU):</i>	17
➤ <i>Feedlots registered outside shoreland with 50-299 AU:</i>	61
➤ <i>Non-NPDES sites ≥300 AU:</i>	248
➤ <i>Feedlots registered with NPDES permits:</i>	9

Total: 335

What would happen if Feedlots and Livestock Management issues are not addressed?

In addition to the MPCA, the Minnesota Department of Agriculture (MDA) is also a key stakeholder in feedlot/livestock management issues. The MDA submitted a Priority Concerns Input Form during the Water Plan’s scoping process (contained in Appendix B). MDA’s main comments concerning feedlots and livestock issues are as follows:

“Livestock manure used as fertilizer has benefited farmers for decades and if applied properly can meet crop nutrient requirements, build up soil organic material and decrease dependence on commercial fertilizers, increase soil fertility, and in some cases, reduce soil erosion. Manure as fertilizer is a constant reminder that we can reuse and recycle a product that was once thought of as a waste product with insignificant value. However, if manure is not properly applied it can lead to negative environmental impacts.

Manure, feed/silage leachate and milkhouse waste can be high in nutrient values, specifically pertaining to nitrogen and phosphorous. If improperly applied, manure does have the potential to contribute to nutrient loading and bacteria/viral levels of water sources. It is important for counties in the state to encourage the development of manure/nutrient management plans for the livestock producers within their borders. These plans address agronomic application rates for crops planted, buffered or protection areas around sensitive features, and reduce the potential of impacting surface or ground water.

Pasturing livestock is a common practice among livestock producers. Several studies and research through the University of Minnesota show that livestock grazing, if done properly, can enhance the quality of grazing lands. As your county is aware, pasture areas are often those areas that are not conducive to farming and generally contain sensitive landscape and surface water features. Nutrients left by livestock serve as a fertilizer source to pasture plant species, which then utilize and filter the nutrients rather than the nutrients being in excess and exiting the area in the form of runoff.

Types of vegetation, length of time in a pasture, stocking density and water availability are all issues livestock producers must be continued to be educated, in order to produce and utilize a productive, environmentally sound pasture or grazing system. Pastures or grazing systems not managed properly can restrict or eliminate vegetative growth and cover, which in turn can result in potentially negative water quality issues” (MDA, July 27, 2012).

What actions are needed in order to properly address Pope County’s Feedlot issues?

- ✓ Continue to locally administer MPCA’s Feedlot Program as a delegated County.
- ✓ Provide educational, technical, and financial assistance, as available, to livestock producers for the implementation of water quality-related BMPs that will reduce impacts from feedlots and manure management issues. Target non-compliant feedlots and provide higher cost-share incentives in TMDL sub-watersheds.
- ✓ Provide educational and technical assistance to agricultural and livestock producers on the proper application of manure and how to develop effective nutrient management plans.
- ✓ Point source pollutants can be addressed on noncompliant feedlots by installing agricultural waste storage facility, bark beds, filter strips, roof structures, and animal mortality facilities.
- ✓ Non-point source pollutants could be addressed through exclusion fencing and by installing animal watering facilities outside of natural water courses.

- ✓ Continue and renew education and outreach efforts on manure/nutrient/pasture management planning and implementation. Work closely with local NRCS staff on this issue as well as regional MPCA staff.
- ✓ Encourage livestock producers to work with Technical Service Providers and/or Certified Crop Advisors to better utilize and understand the value of using GIS/GPS technologies in developing manure management plans, comprehensive nutrient management plans, pasture management plans, and rotational grazing plans.
- ✓ Encourage involvement from livestock producers located within impaired watersheds and vulnerable areas in the landscape. One such approach may be the development of a local agricultural advisory committee.
- ✓ Encourage livestock producers to participate in an on-farm environmental assessment program. A number of livestock producer groups in the state have specific programs that are available to their members. The Livestock Environmental Quality Assurance (LEQA) program is available to all livestock producers in Minnesota. LEQA is an on-farm environmental assessment and results in a water quality score for a farm.
- ✓ Annually target key feedlot upgrades in high-priority areas, such as near Impaired Waters.

Both Pope County Land and Resource Management and the Pope County SWCD are committed to being fully engaged on assisting with the County's feedlot management issues.

D. Subsurface Sewage Treatment Systems Assessment

Why are Subsurface Sewage Treatment Systems a Priority Concern? Subsurface Sewage Treatment Systems (SSTS), commonly known as septic systems, pose a threat to public health and the environment if not properly installed and maintained. One of the health threats is the dangerous E.coli bacteria is often connected to failing septic systems.

SSTS are regulated by Minnesota Statutes 115.55 and 115.56. These regulations outline:

1. Minimum technical standards for individual and mid-size SSTS (Chapter 7080 and 7081);
2. A framework for local administration of SSTS programs (Chapter 7082) and;

3. Statewide licensing and certification of SSTS professionals, SSTS product review and registration, and establishment of the SSTS Advisory Committee (Chapter 7083).

What Risks do SSTS's Pose and Who/What is at Risk? According to the MPCA, “Exposure to sewage through ingestion or bodily contact can result in disease, severe illness, and in some instances death from bacteria, viruses and parasites contained in waste. Therefore, it is important for sewage to be properly treated” (***Facts About Subsurface Sewage Treatment Systems, MPCA-June 2008***). In addition, high phosphorus levels found in sewage can also lead to excessive algae growth, causing an increase in eutrophic states in waterbodies resulting in degraded water quality.

Where are Pope County's SSTS Located? SSTS's are most commonly located throughout the rural areas of Pope County and are the primary means of treating sewage for rural households. SSTS issues are a very important part of Pope County's Water Plan. According to the Pope County Land and Resource Management Department, Pope County has approximately 3,511 septic systems, which is approximately 56% of households in the County. In 2011, Pope County issued SSTS permits for 36 trench and bed systems, 27 mound systems, and 5 at-grade systems. Between 2000 and 2009, the County issued 1,013 SSTS permits, of which 381 were for failing systems.

What actions are required to properly address SSTS issues? SSTS concerns need to be properly addressed in the Water Plan to minimize the potential for them to have negative effects on public health and/or the environment. In addition, proper SSTS management will also help to protect overall water quality and will help address some of the problems listed in the County's Impaired Waters. Pope County enforces MN Rule Chapter 7080-7083 through the Pope County SSTS Ordinance, which requires SSTS inspections in a number of situations, such as when a property is transferred, or an addition to an existing home.

In 2012, Pope County successfully applied for Clean Water Legacy Funds through the Minnesota Board of Water and Soil Resources (BWSR) to provide low-income residents grant assistance for upgrading SSTSs. The County was awarded \$63,560.

The following items should also be considered to assist with properly addressing SSTS issues;

- ✓ Continue to provide oversight and assistance of State and County regulations and inspection services as part of the County's SSTS Program.
- ✓ Provide information and assistance to homeowners on proper SSTS design, installation, operation, and maintenance.

- ✓ Secure and administer financial assistance programs to provide assistance for homeowners to upgrade noncompliant SSTs.
- ✓ Provide educational, technical, and financial assistance, as available, to homeowners to upgrade noncompliant SSTs.
- ✓ Investigate and initiate corrective measures for improperly discharging SSTs.
- ✓ Promote cost-share incentive payments available through the watershed districts to encourage voluntary septic system upgrades.
- ✓ Target septic inspections in TMDL sub-watersheds.

E. Aquatic Invasive Species Assessment

What is the Concern? Aquatic Invasive Species (AIS) are species that are not native to Minnesota and displace native species in their natural habitat. They include both aquatic plant and animal species. Prevention of the spread of Aquatic Invasive Species is a priority in Pope County to protect the environmental integrity of our lake's and river systems for recreation and consumption.

Why are AIS a Priority Concern? AIS cause economic, environmental, or harm to human health. It is illegal to transport any aquatic plants, such as zebra mussels, Asian Carp, New Zealand mudsnails, or other prohibited invasive species, or to launch a boat or trailer with these species attached. The Minnesota Department of Natural Resources (DNR) is the primary stakeholder responsible for providing educational efforts, establishing local grant programs, and for initiating Statewide legislation on AIS. They maintain the following website devoted to AIS issues:

http://www.dnr.state.mn.us/invasives/index_aquatic.html

Who is affected the most by AIS? According to the Aquatic Nuisance Species (ANS) Task Force (<http://anstaskforce.gov/taskforce.php>), which was established by the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, AIS threatens the diversity or abundance of native species, the ecological stability of infested waters, or any commercial, agricultural, aquaculture or recreational activities dependent on such waters. In addition to the severe and permanent damage to the habitats they invade, ANS also adversely affect individuals by hindering economic development, preventing recreational and commercial activities, decreasing the aesthetic value of nature, and serving as vectors of human disease.

Where are AIS Located in Pope County? The Minnesota DNR maintains a list of where each type of AIS is known to be found throughout the State. As of July 30, 2012, the following AIS were located in Pope County:

Eurasian Water Milfoil:

- Gilchrist (61-0072)
- Minnewaska (61-0130)

Zebra Mussels:

- Emily (61-0180)
- Minnewaska (61-0130)
- Outlet Creek from Minnewaska Lake to Emily Lake
- Shallow Pond (61-0112)
- unnamed pond (61-0511)
- unnamed wetland located in Section 9 and 16, Township 124N, Range 39W (61-0231)
- unnamed wetland located in Section 20 and 21, Township 124N, Range 39W (61-0420)
- unnamed wetland located in Section 16, Township 124N, Range 39W (61-0422)
- unnamed wetland located in Section 20, Township 124N, Range 39W (61-0505)

What is the Risk if AIS issues are not addressed and what should be done? Pope County fully recognizes the significance of what AIS can do to the local environment and economy. All waterbodies can be affected by AIS. These include the following Best Management Practices:

Boating and Water Recreation

You must clean visible aquatic plants, zebra mussels and other prohibited species from watercraft, trailers, and equipment before transporting from any water access. In addition, you must drain water from bilge, livewell, motor, ballast tanks, and portable bait containers before leaving water accesses or shoreline property and keep drain plug out and water-draining devices open while transporting watercraft. Finally, unwanted bait must be disposed of in the trash.

You may not transport aquatic plants, water, or prohibited invasive species such as zebra mussels or Eurasian water milfoil; dump live bait into state waters, on shore, or on the ground; and launch, or attempt to place, watercraft, trailers or equipment with aquatic plants, zebra mussels, or prohibited invasive species into any state waters. In addition, it is advised to spray watercraft with high-pressure water and dry for at least five days.

Aquarium and Water Garden Owners

Release or escape of fish and plants from aquariums and water gardens can harm Minnesota waters and native species. Besides not being good for our lakes and rivers, it is illegal in Minnesota. Aquarium fish can carry diseases that can kill native fish. Invasive plants can clog waterways and snag boat propellers. Properly disposing of fish and aquatic plants is not only simple; it can assist with minimizing AIS from being spread.

Shoreland Owners

In addition to properly removing watercraft, shoreland owners also need to properly remove docks and lifts for winter storage. Following the BMPs listed for removing boats and water recreations also apply to docks and lifts.

The Minnesota Department of Natural Resources is the main stakeholder statewide that addresses AIS issues, including educational and enforcement measures. In addition, the Pope County Coalition of Lakes (COLA) is the main local stakeholder working on AIS issues. The following Water Plan Action Items should be considered to properly address Pope County's AIS issues:

- ✓ Educate the public and provide technical assistance, as available, on AIS issues and prevention methods. Create news articles and proactively distribute AIS information.
- ✓ Work with the DNR to ensure that proper signage is located at all public access points.
- ✓ Hold an AIS Public Informational Meeting.
- ✓ Examine AIS removal techniques and implement accordingly.
- ✓ Use available DNR resources to help promote AIS awareness, including informational materials, signs, and grant opportunities.

Section Two: Erosion and Sediment Control

This section of the Water Plan provides an assessment of Pope County's erosion and sediment control issues. To begin with, a description of the County's soils is profiled using the County's Soil Survey.

F. Erosion and Sediment Control Assessment

Why is it a Priority Concern? As an agricultural county, soils are one of Pope County's most valuable natural resources. The loss of soils through both wind and water erosion not only negatively affects the ability to raise crops, erosion and sedimentation also negatively affects the quality of water resources. This impact is not only felt locally, but also collectively downstream from Pope County. In addition, agricultural runoff is also a significant source of nutrient loading to both surface and groundwater. To help ensure the long-term productivity of the County's soils, these rivers, lakes and streams depend upon implementing Best Management Practices to minimize erosion and sedimentation.

Where in the County is it a Priority Concern? Pope County's 9 major soil associations are displayed in Map 2B¹ on the following page. Table 2A provides a brief description of the soils, and indicates what percentage of each soil association is considered to be erosion-prone. The erosion-prone soils appear in Map 3A¹.

The Pope County Soil Survey can be viewed online at the following Natural Resources Conservation Service (NRCS) website:

http://soils.usda.gov/survey/online_surveys/minnesota/

In addition to viewing the County's written Soil Survey, the NRCS also maintains the following online soil mapping website:

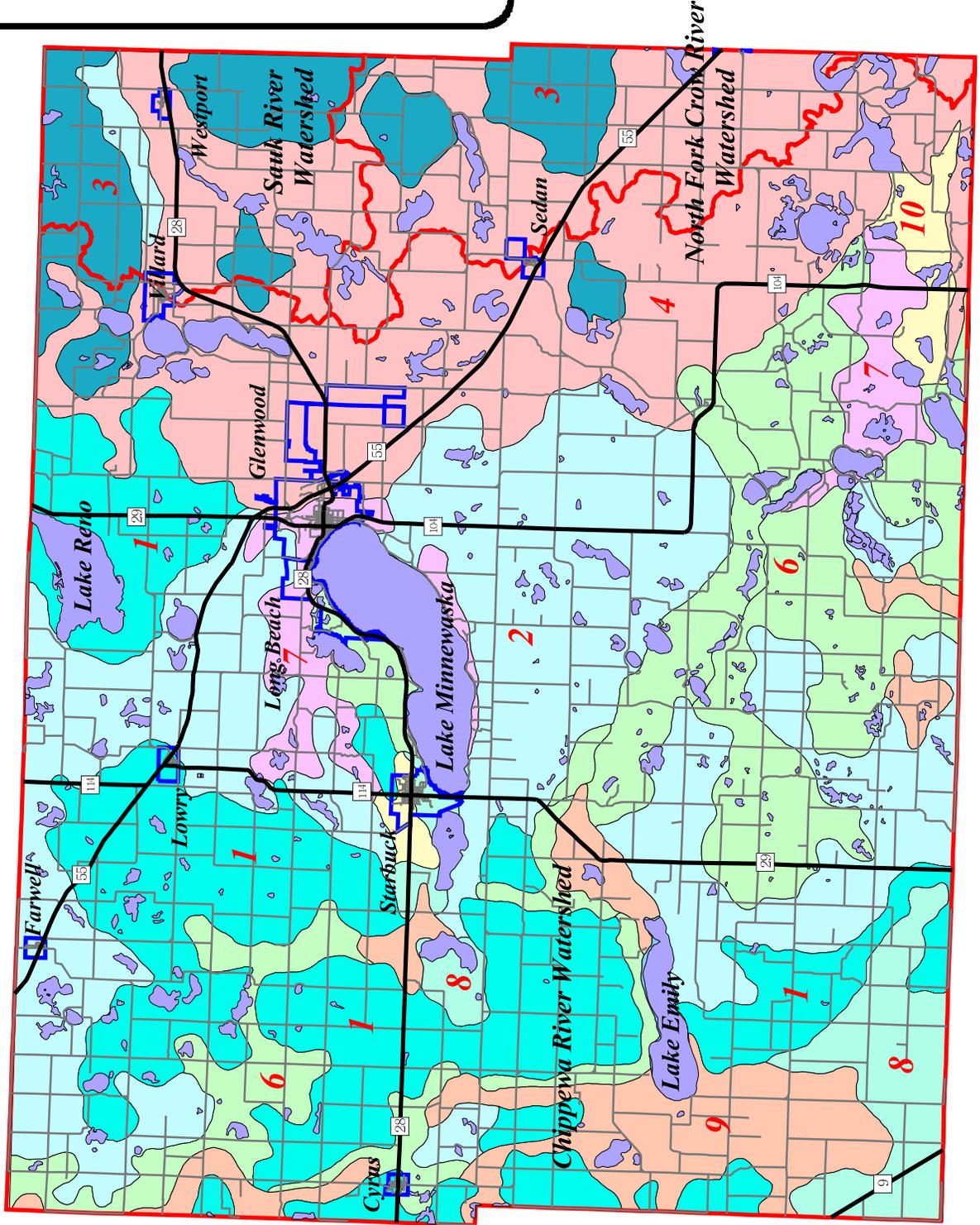
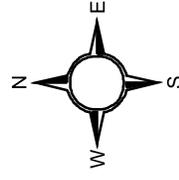
<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

¹ Maps 2B and 3A were created for Pope County's Water Plan in 2002.

Map 2B: Pope County's Soils

Legend

-  Major Roads
 -  Minor Roads
 -  Cities
 -  Lakes
 -  Major Watershed Boundaries
- Soils**
-  1
 -  2
 -  3
 -  4
 -  5
 -  6
 -  7
 -  8
 -  9
 -  10
- Barnes-Langhei-Doland
 - Barnes-Langhei-Svea
 - Clarion-Canisteo-Nicollet
 - Estherville-Muck
 - Lake/No Value
 - Langhei-Barnes
 - Langhei-Barnes-Waukon-Sioux
 - Marysland-Muck-Arveson
 - Renshaw-Estelline
 - Sioux-Maddock

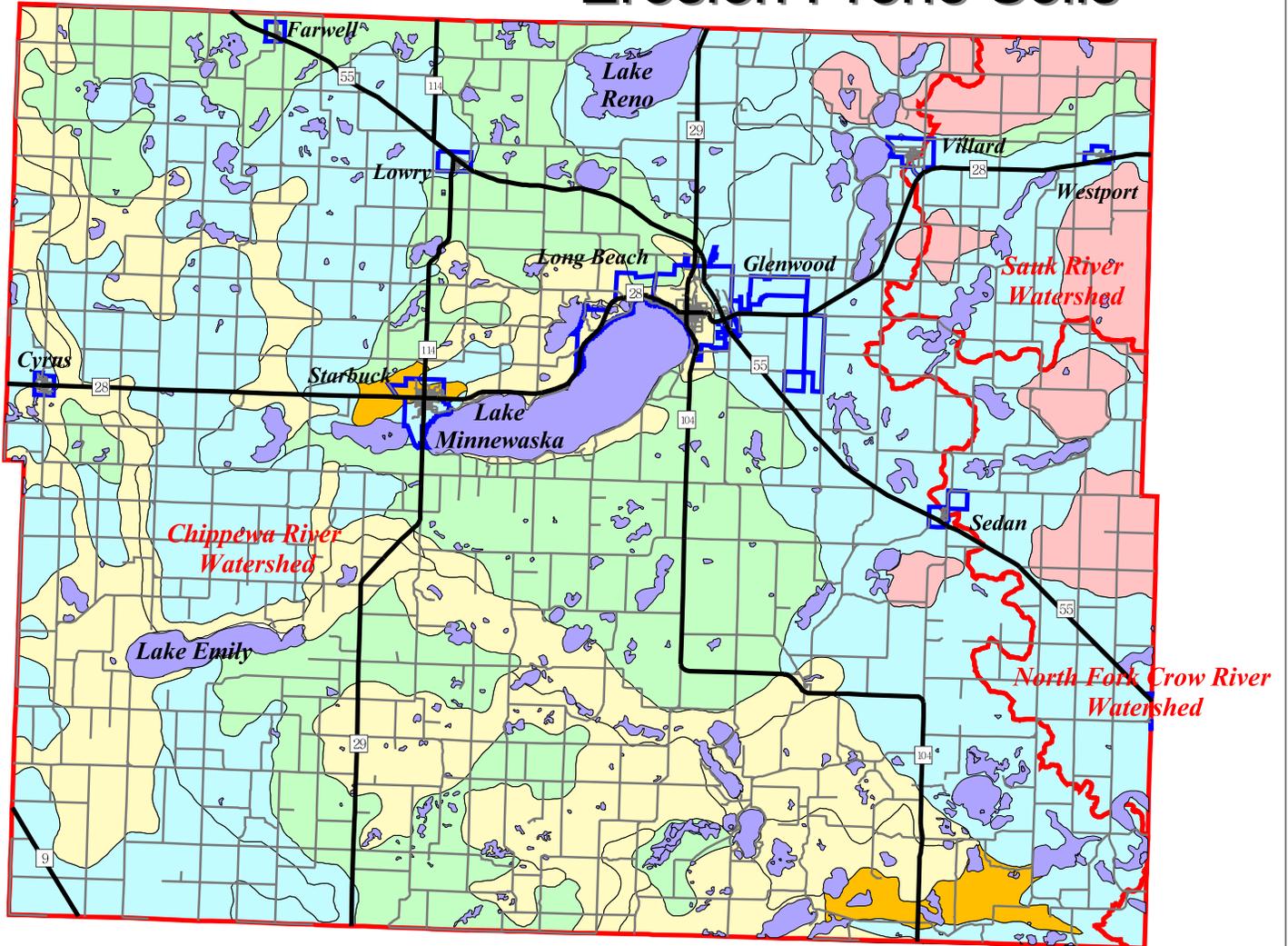


Source: MNDOT BaseMap '00,
USDA Soil Survey 1982
Date: June 23, 2003
Produced By: UMW/RDC GIS Service Bureau

Table 2A:
Pope County's Soils (Please refer to the Soils Map)

Soil Association	Description and General Location	A	B	C (A x B = C)
		% of County	% Erosion-Prone	% of County Erosion-Prone
1. Barnes-Langhei-Doland	Deep, level to sloping, well-drained and somewhat excessively drained, loamy soils. Located mainly in northwestern Pope County.	17%	80%	13.6%
2. Barnes-Langhei-Svea	Deep, undulating to rolling, somewhat excessively drained to moderately well drained, loamy soils. Located mainly in north to south central Pope County.	24%	70%	16.8%
3. Langhei-Barnes	Deep, rolling to hilly, somewhat excessively drained and well-drained, loamy soils. Located in southern Pope County and near the streams to the west.	11%	85%	9.4%
4. Langhei-Barnes-Waukon-Sioux	Deep and very shallow, hilly to steep, well-drained to excessively drained, loamy soils. Located around Lake Minnewaska and in the southeastern part of the County.	7%	85%	6%
5. Sioux-Maddock	Hilly to steep, mainly excessively drained soils that are very shallow over sand or gravel. Near the terminal moraine area in the central part of the County.	3%	95%	2.9%
6. Clarion-Canisteo-Nicollet	Deep, level to sloping, well-drained to very poorly drained, loamy soils. Mainly in northeastern Pope County.	6%	65%	3.9%
7. Estherville-Muck	Level, excessively drained soils that are shallow over sand and gravel, and very poorly drained organic soils. Located on the eastern third part of the County.	21%	80%	16.8%
8. Renshaw-Estelline	Level to gently sloping, somewhat excessively drained to well-drained soils that are shallow to moderately deep over sand or gravel. Adjacent to the Chippewa River.	8%	85%	6.8%
9. Marysland-Muck-Arveson	Level, poorly drained soils that are shallow to moderately deep over sand, and very poorly drained over organic soils. Mainly located in southwestern Pope County.	3%	80%	2.4%
Totals		100%	N/A	78.6%

Map 3A: Pope County's Erosion Prone Soils

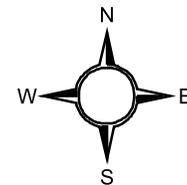


Legend

	Major Roads		Erosion Prone %
	Minor Roads		65%
	Cities		70%
	Lakes		80%
	Major Watershed Boundaries		85%
			95%

Note

The Erosion Prone Soils is calculated by percentages from the County Soils book.



Source: MNDOT BaseMap '00,
USDA Soil Survey 1982
Date: June 25, 2003
Produced By: UMRVDC GIS Service Bureau

Pope County Transect Survey

A transect survey examines random farmland throughout the county to estimate soil erosion rates by taking a look at how much crop residue exists. One method of controlling soil erosion is conservation tillage, which is the practice of leaving plant residue on the surface of tilled soil. Crop residues that decompose on the surface adds organic matter to the soil. In addition, extra residue on top of the soil surface reduces the impact of rain on the soil particles, reducing soil erosion. Crop residue also strengthens the surface of the soil, which lowers the runoff potential.

The results of a transect survey conducted in 2007 for the Chippewa River Watershed appear on the next page. Of particular interest, note that corn & soybeans make up 95% of the total points (660 + 496)/1212 on the survey. In addition, only 16% of the corn ground had conservation tillage (greater than 30 residue @ planting). Finally, over half the corn ground was intensive tillage (0 to 15 % residue at planting).

What would happen if the Priority Concern was not addressed? The loss of prime farmland through soil erosion impacts the farming community's ability to produce high quality crops over the long-term. In addition, soil erosion and sedimentation in water (referred to as turbidity) is one of the pollutants identified in Pope County's List of Impaired Waters. High turbidity impairs degrade fish habitat and limit the production of game fish, thereby reducing the recreation opportunities of our waterbodies. High turbidity levels also reduce the establishment of vegetation and degrade the water quality in recreational lakes.

What needs to be done to properly address Erosion and Sedimentation? According to the Minnesota Department of Agriculture's (MDA) website, the MDA recommends voluntary approaches to addressing soil loss and soil erosion issues and offers some suggestions as outlined below to engage agricultural producers in your county. Many advances have been made over the past decades to assist crop and livestock producers in managing their lands, including both from a technological and scientific standpoint. Advancements have also been made in recent years regarding seed technology, nutrient placement and timing of application, crop physiology research and overall land management, including improved soil and water management techniques. However, on certain soils, steep slopes, hydrologic settings or unique landscape features, there may be a need for additional voluntary measures to be implemented.

- Innovative residue management techniques that are crop rotation appropriate and designed to fit the needs of individual farming operations.
- Survey tools. The MDA developed a diagnostic tool a number of years ago called Farm Nutrient Management Assessment Process (FANMAP) to get a clear understanding of existing farm practices regarding agricultural inputs such as fertilizers, manures and pesticides.

Pope County Transect Survey Results (2007)

2007 Chippewa River Watershed Summary (26)

Annual Crop	Total Points	Conservation Tillage (greater than 30% residue)			=	Total Conservation Tillage	Other Tillage Practices	
		No-Till	Ridge-Till	Mulch-Till			(15-30% residue) Reduce-Till	(0-15% residue) Intensive-Till
Corn	660	6	0	99	105	199	356	
Small Grain (Spring-Seeded)	54	1	0	8	9	6	39	
Small Grain (Fall Seeded)	0	0	0	0	0	0	0	
Soybeans (Full Season)	496	33	2	238	273	149	74	
Soybeans (Double-Cropped)	0	0	0	0	0	0	0	
Cotton	0	0	0	0	0	0	0	
Grain Sorghum	0	0	0	0	0	0	0	
Forage Crops	0	0	0	0	0	0	0	
Other Crops	2	0	0	0	0	0	2	
Total Points	1212	40	2	345	387	354	471	
Perm. Pasture	64							
Fallow	2							
Forages	51							
Conservation Reserve Program	129							

Annual Crop	Total Points	Conservation Tillage (greater than 30% residue)			=	Total Conservation Tillage	Other Tillage Practices	
		No-Till	Ridge-Till	Mulch-Till			(15-30% residue) Reduce-Till	(0-15% residue) Intensive-Till
Corn	660	0.9%	0.0%	15.0%	15.9%	30.2%	53.9%	
Small Grain (Spring-Seeded)	54	1.9%	0.0%	14.8%	16.7%	11.1%	72.2%	
Small Grain (Fall Seeded)	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Soybeans (Full Season)	496	6.7%	0.4%	48.0%	55.0%	30.0%	14.9%	
Soybeans (Double-Cropped)	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Cotton	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Grain Sorghum	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Forage Crops	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Other Crops	2	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	
Total Points	1212	3.3%	0.2%	28.5%	31.9%	29.2%	38.9%	
Perm. Pasture	64							
Fallow	2							
Forages	51							
Conservation Reserve Program	129							

- Enhanced promotion of buffer strips, filter strips, water and sediment and control basins and grassed waterways in areas with steep slopes, coarse soils and other high priority areas. The MDA realizes that resources are needed to accomplish promotional and educational initiatives to encourage the voluntary adoption of these types of practices.

On March 8, 2013, the Minnesota Department of Natural Resources Fisheries Office in Glenwood submitted the following water plan implementation suggestions. A copy of the correspondence appears in Appendix B.

Trapper's Run Creek Sedimentation Basin

A roughfish barrier was installed in Trapper's Run Creek to prevent carp from moving upstream from Pelican Lake and into winterkill lakes further up into the Trapper's Run Creek. In absence of predator fishes, these shallow basins offer ideal spawning and nursery habitat for common carp. After multiple funding proposals, the project received funding and a three-stage sheet pile weir was installed in Trapper's Run Creek at an old railroad bridge crossing approximately ½ mile west of Pelican Lake. The structure impounded approximately 5 acres of water and a five foot vertical barrier to prevent carp from moving up Trapper's Run Creek. Project expenditures were approximately \$35,000.

Rapid snow melt in 1997 resulted in significant erosion and sediment loading into the creek. Most of the impounded area behind the barrier was filled with coarse sediments. The barrier's secondary benefit as a sediment basin was promptly lost. Means to remove accumulated sediments were explored, but were deemed inefficient or too costly. At issue, there wasn't any thought of the impoundment functioning as a sedimentation basin so some critical design components were not build into the project.

The Land and Resource Management Director pushed to restore the sediment basin function. He contracted with Bonestroo, Rosene, and Anderlik & Associates to survey and develop design specifications to regrade the impounded area to improve function and maintenance operations (the design plans are included in Appendix C). Key enhancements included incorporating a stop long structure into the barrier to manage water level, separating the impoundment and redirecting stream flow to slow the water and allow finer materials to settle out, and an equipment access road. The project has yet to receive funding. One of the issues is who would take ownership of the basin or coordinate and fund future maintenance. The sediment basin is admittedly very small given the 25 square mile watershed area, but with MPCA and BWSR input and buy-in, the project is likely worthy of submitted for consideration of Clean Waters funding.

Hackberry Creek Watershed, Lake Minnewaska

Hackberry Creek which flows into Lake Minnewaska has a watershed area of 3,365 acres. The creek has a steep grade from County Highway 18 to the lake. Significant bank erosion and channel cutting has been occurring near the lake. Former County Commissioner Dean Paulsen has been working on constructing an impoundment on the creek. Slowing stream velocity and retaining some sediment should reduce stream erosion and sediment delivery to Lake Minnewaska. Other BMPs designed to keep water on the land would complement such work. Attachments include delineation of the Hackberry Creek Watershed Area in relation of Lake Minnewaska.

Other project considerations in the Lake Minnewaska watershed area

The erosion stemming off the hillsides surrounding Glenwood need to be addressed. There is an estimated 125 to 150 ft drop from the top of the hills to Lake Minnewaska over a distance of one mile or less. Significant channel cutting is evident in the deep gullies that have formed. Such channel erosion is very evident from the Glenwood golf course, Barsness Park, and municipal areas of northeast Glenwood. These are areas of highly erodible soils. Fixes may prove challenging and expensive, but the problem is definitely needs attention.

Shoreline Erosion, Lake Minnewaska

The atypically high water level experienced in mid-summer of 2011, coupled with high winds and waves resulted in severe shoreline erosion. A pilot project could be developed to install and evaluate various bioengineered or manufactured products to stabilize shoreline without reliance on rip-rap. The DNR and its Area Hydrologist would need to fully support such a project.

Section Three:

Surface Water Management

This section of the Water Plan provides an assessment of Pope County’s surface water management, including subsections on agricultural drainage, stormwater management, and wetlands/water retention.

G. Agricultural Drainage Assessment

Why is Agricultural Drainage a Priority Concern?

Drainage ditches were installed to provide drainage for agricultural lands, at a time when Federal and State policies were to increase agricultural production. Having adequate drainage for agricultural production is an essential component of our economy, however, most of the drainage systems installed in the past were designed primarily to remove water as rapidly as possible, without regard to effects on surface water quality and quantity.

Best management practices (BMPs), such as filter strips and alternative drainage methods, need to be targeted on drainage systems to prevent exacerbating current water quality and quantity problems. Implementation of such practices would not only improve the quality of the County’s surface water, but it would also reduce the need for expensive ditch cleanout and repair.

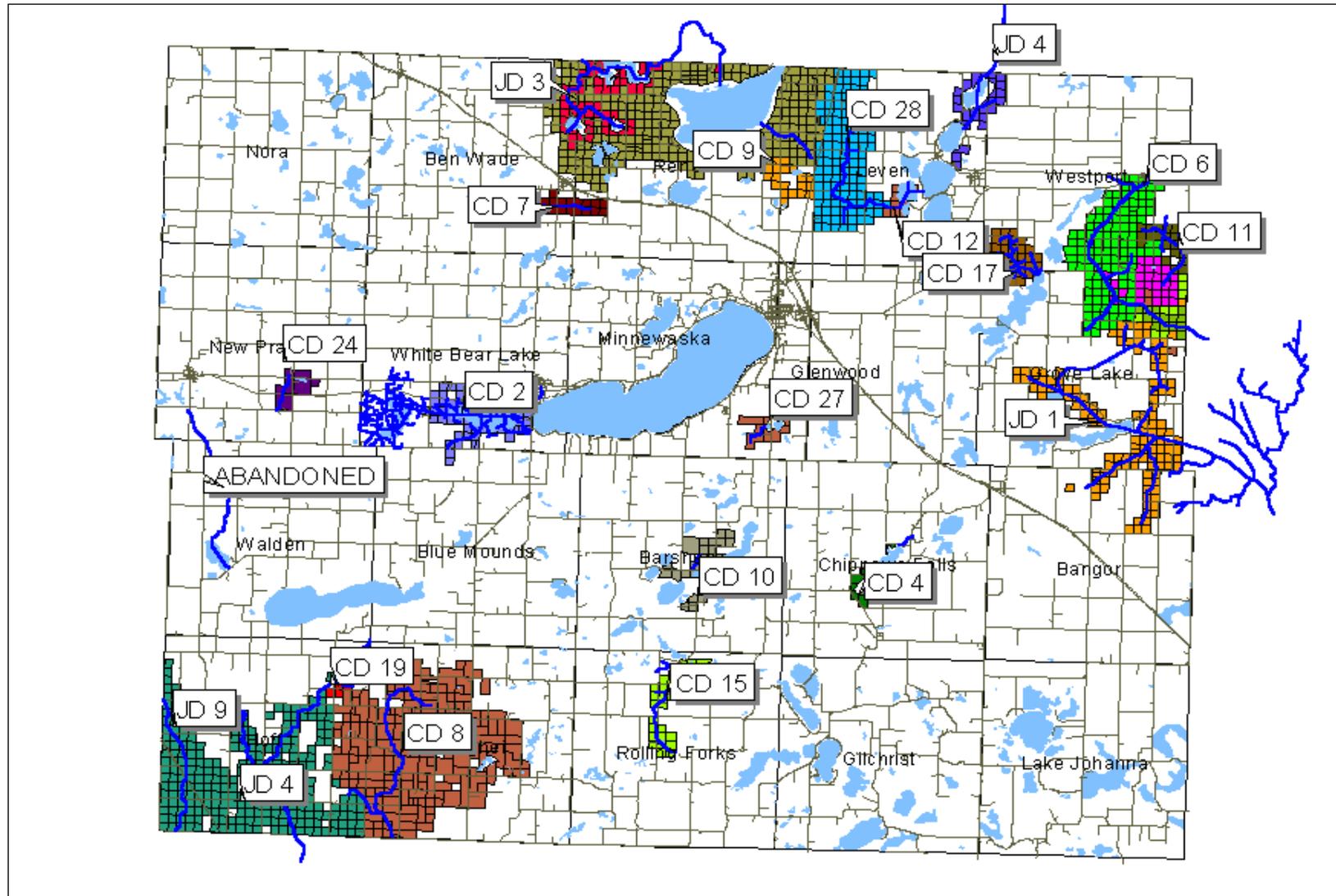
The Minnesota Department of Natural Resources (DNR) has observed more “flashy” stream flows throughout the State, meaning that both high and low flows are exaggerated. Because many drainage ditch systems were designed to remove large quantities of water in a short duration, flooding problems are occurring more frequently, especially following major storm events and during the spring snowmelt. To minimize flooding impacts, upland storage needs to be increased to reduce the overall volume of water transported by the drainage system.

Due to recent high crop prices, an increasing amount of farmland is being tilled and pattern tilled. This presents itself the opportunity to install new conservation drainage systems and to make improvements to the existing system. The newer systems can be designed to reduce nutrient losses and also positively affect the timing and rate of flows into surface waters.

Where are Drainage Systems Located in Pope County?

Map 2A shows the location of the drainage ditches (created for the Pope County Ditch Inventory, August 2001). There are approximately 200 miles of legal ditches in Pope County. For detailed ditch maps and related information, please contact the Pope County Highway Department.

Map 2A: Pope County's Drainage Inventory



What are the Risks Associated with Agricultural Drainage and Who is at Risk?

Although proper agricultural drainage is a necessary component in a healthy farming community, some environmental risks do exist if Best Management Practices (BMPs) are not implemented properly. These water-related risks may include:

- Loss of wetlands and water storage
- Increased flooding (due to loss of wetlands and water storage)
- Increased loss of nitrates through tile drains; increased phosphorus levels
- Increased soil erosion and turbidity
- Increased pesticides and farm chemicals in public waters

Typically, drainage systems are degraded by sediment, nutrients and bacteria. This, in turn, degrades the quality of County's other water features. To minimize this problem, landowners need to implement Best Management Practices (BMPs), such as filter strips, along the County's drainage ditches. Implementation of such practices not only improves the quality of the County's surface water, but it also reduces the need for expensive ditch cleanout and repair. Besides problems related to water quality, Pope County's drainage systems pose water quantity threats as well. Because ditches were designed to remove a large quantity of water in a short duration, flooding problems occur, especially following major storm events and during the spring snowmelt.

Who is at Risk of reduced functioning Agricultural Drainage systems?

Agricultural producers can be impacted by reduced efficiency of the Pope County public drainage system due to the increasing amount of drainage entering the County system as a result of increased tiling. Upgrades to the drainage system are necessary and installing controlled drainage practices would greatly benefit all producers utilizing the system.

What actions are needed to properly address Agricultural Drainage issues in Pope County?

A number of drainage authorities in Minnesota have undertaken a systematic redetermination of benefits and damages for all of the Chapter 103E drainage systems under their jurisdiction, including surface ditches and subsurface tile systems. Kandiyohi County is one of counties going through this process, along with Freeborn, Martin, Steele, Sibley, and Faribault Counties. According to a BWSR (www.bwsr.state.mn.us/drainage), in a publication titled "Redetermination of Benefits and Damages for Drainage Systems:"

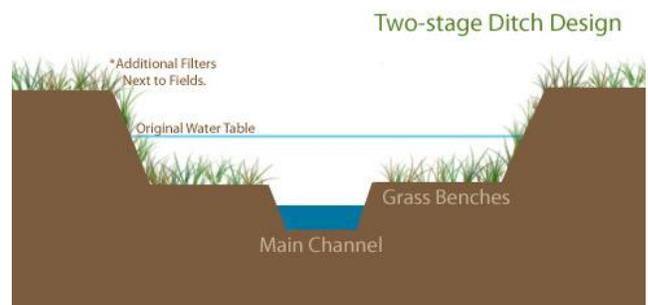
- Benefited lands and benefits of many public drainage systems have not been updated for decades, some for over a century.
- Drainage system benefits are determined at one point in time, with no provision in Chapter 103E to index for inflation over time. The cost of a repair cannot exceed the total value of benefits of the drainage system on record.
- The drainage system repair fund limit is 20% of the total assessed benefits of the system, or \$100,000, whichever is greater.
- Chapter 103E projects that require right-of-way (establishment, improvement, or repair by re-sloping of ditch side slopes) must have viewers appointed to determine associated benefits and damages. Partial system projects can create benefit inequities.
- As new private drainage is outlet into a public drainage system, the total benefits of the system and the relative benefits to land parcels and other infrastructure change. These benefits and associated assessments for repairs can only be updated via a redetermination of benefits and damages.

Due to the recent success of the Redetermination of Benefits in the various counties mentioned, the Pope County Water Management Task Force should consider developing an Action Step to support the redetermination process locally, as needed or requested.

One of the conservation drainage practices identified by the Minnesota Department of Agriculture (MDA) is to promote the use of two-stage ditch systems. The Nature Conservancy explains the two-stage ditch concept:

“Researchers have developed a drainage design by observing the natural processes of stable streams and rivers that could relieve the erosion, scouring and flooding that conventional ditches may cause. This design, known as the two-stage ditch, is a drainage channel that will benefit both agriculture and the environment.

The concept of the two-stage ditch is simple. The design incorporates a floodplain zone, called benches, into the ditch by removing the ditch banks roughly 2-3 feet above the bottom for a width of about 10 feet on each side. This allows the water to have more area to spread out on and decreases the velocity - or energy - of the water. The flow of that water is a function of the velocity and area of the water.



And since flow can be considered as the amount of water moving through the ditch, the design has actually increased the amount of water that the ditch can process by constructing the benches, or floodplain area. This not only improves the water quality, but also improves the biological conditions of the ditches where this is located” (<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/howwework/two-stage-ditches.xml>).

Many counties and watershed districts have made it a priority to develop a Comprehensive Drainage Management Plan. The purpose of a Drainage Plan would be to identify problems and potential solutions to the existing drainage system. The main emphasis would be to ensure sufficient drainage for crop production, while maintaining and improving the County’s water quality and quantity issues. Potential funding sources can be pursued from the Clean Water Fund and the Legislative Citizen Commission of Minnesota Resources (LCCMR).

The NRCS/USDA recently published the following description of a Drainage Water Management (*Minnesota, October 2012*):

“The objective of Drainage Water Management (DWM) is to control soil water table elevations and the timing of water discharges from subsurface or surface agricultural drainage systems for one or more of the following purposes:

- Reduce nutrient, pathogen, and/or pesticide loading from drainage systems into
- downstream receiving waters
- Improve productivity, health, and vigor of plants
- Reduce oxidation of organic matter in soils
- Reduce wind erosion or particulate matter (dust) emissions
- Provide seasonal wildlife habitat
- Peak discharge modification”

In 2007, a portion of the Public Drainage Statute 103E.021 was revised to read:

“a drainage authority may implement permanent buffer strips of perennial vegetation approved by the drainage authority or side inlet controls, or both, adjacent to a public drainage ditch, where necessary to control erosion and sedimentation, improve water quality, or maintain the efficiency of the drainage system” (M.S. 103E.021 - 2007).

This enables drainage authorities to require vegetated buffer strips and/or side inlet controls other than by the 'traditional method' of appointing viewers for improvements or redetermination of benefits.

The Minnesota Department of Agriculture (refer to Appendix B) also suggests that “local plans should provide guidance, objectives, goals and action items for further coordination of agricultural water management issues and Conservation Drainage (CD) implementation efforts at the local level. A number of CD practices exist to address water quality issues. There is no single CD practice that will address all agricultural drainage issues. However, multi-purpose approaches to managing water quality and quantity on the agricultural landscape using a suite of CD initiatives is the best approach. It is recommended that:

- A. Local plans discuss how CD practices can be utilized based on the drainage needs of the county coupled with associated water management issues.
- B. Local drainage authorities be proactive in encouraging the use of CD practices and designs during repairs and improvements of existing drainage systems.
- C. Redetermination of Benefits for ditch systems continue to be done in a proactive, consistent and systematic manner.
- D. Buffer initiatives continue to be implemented consistently and according to current drainage law.
- E. The local drainage authority continues to base drainage regulations on science and current best management practice knowledge.
- F. The local drainage authority consider multipurpose drainage approaches as developed by BWSR”.

H. Stormwater Management Assessment [partially recreated from www.pca.state.mn.us]

Why is Stormwater Management a Priority Concern and What is at Risk?

According the Minnesota Pollution Control Agency, the surest way to improve water quality in Minnesota is to better manage stormwater. Unmanaged stormwater can have devastating consequences on the water quality of lakes, streams and rivers we enjoy. Stormwater often contains oil, chemicals, excess phosphorous, toxic metals, litter, and disease-causing organisms. In addition, stormwater frequently overwhelms streams and rivers, scours stream banks and river bottoms and hurts or eliminates fish and other aquatic organisms.

To better manage stormwater across the state, the MPCA administers the requirements of the federal Clean Water Act in addition to its own State Disposal System requirements. At the MPCA,

the Stormwater Program includes three general stormwater permits: the Municipal Separate Storm Sewer Permit, the Construction Stormwater Permit and the Industrial Stormwater Permit. Each program administers a general permit (and in some cases, individual permits) that incorporates federal and state requirements for Minnesota stormwater management.

Stormwater management has evolved substantially over the past 20 years. Historically, the goal was to move water off the landscape quickly. There is now greater emphasis to focus on keeping the rain where it falls and mimicking natural hydrology in order to minimize the amount of pollution reaching our lakes, rivers and streams, and to recharge our ground waters. In order to successfully do so, standards are needed to create consistency in design and performance. In response to this need, and advanced by a diverse group of partners, the Minnesota Legislature allocated funds to “develop performance standards, design standards or other tools to enable and promote the implementation of low impact development and other stormwater management techniques.” (Minnesota Statutes 2009, section 115.03, subdivision 5c).

Minimal Impact Design Standards (MIDS) represents the next generation of stormwater management and contains three main elements that address current challenges:

- A higher clean water performance goal for new development and redevelopment that will provide enhanced protection for Minnesota’s water resources.
- New modeling methods and credit calculations that will standardize the use of a range of “innovative” structural and nonstructural stormwater techniques.
- A credits system and ordinance package that will allow for increased flexibility and a streamlined approach to regulatory programs for developers and communities.

The development of Minimal Impact Design Standards is based on low impact development (LID) — an approach to storm water management that mimics a site’s natural hydrology as the landscape is developed. Using the low impact development approach, storm water is managed on site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation (Minnesota Statutes 2009, section 115.03, subdivision 5c).

Where are Stormwater Management concerns in Pope County?

Stormwater management concerns are primarily concentrated in the developed areas of Pope County, including cities, roadways and parking lots. Many of the newer developments have modernized stormwater management designs. Conversely, many of the older developments were not constructed with sound stormwater management principles.

One of the largest water planning issues in Pope County is working with the City of Glenwood to address its stormwater concerns. The text box on page 2-4 highlights some of the City's current efforts to address these issues. These projects were identified in the City of Glenwood's Stormwater Management Plan. The Stormwater Management Plan divides the City into five (5) drainage basins that flow into Lake Minnewaska. These identified drainage basins total 1796-acres. The land in these areas are mainly developed, however there are some areas of field and forest that provide habitat for fowl and wildlife. State Highways 28, 29 and 55 and County Highway 104 add to the impervious surfaces located in the five (5) drainage basins. The Pope County Water Plan Task Force has communicated throughout the Water Plan's planning process, the desire to work with the City on implementation stormwater mitigation activities.

Who are the Key Stakeholders in Properly Addressing Stormwater Concerns?

Since the major stormwater management concerns are in the developed areas of Pope County, the various municipalities are the major stakeholders involved with properly addressing stormwater concerns. The Pope County Land and Resource Management Office assists in reviewing stormwater management plans for all types of development. Watershed Management-Like Organizations also play a large role in promoting stormwater BMPs. At the State level, the Minnesota Pollution Control Agency (MPCA) is the largest stakeholder dealing with stormwater issues, largely due to its oversight responsibility with the Clean Water Act. For more information on MPCA's stormwater rules, initiatives, and programs, please visit the following website:

www.pca.state.mn.us

What actions are needed to properly address Stormwater Management issues in Pope County?

The MPCA provides guidelines for stormwater Best Management Practice (BMPs) and has information available for homeowners to industrial operations. Promoting these BMPs becomes an essential component of what Pope County can do to assist with minimizing stormwater pollution. The most effective solution to stormwater pollution is encouraging people to change the way they see and treat stormwater. To accomplish this, the Pope County Water Management Task Force should consider creating Action Steps to assist with items identified in this subsection, including assist with developing/reviewing Stormwater Management Plans and working with the City of Glenwood on stormwater management issues.

I. Wetlands and Water Storage/Retention Assessment

Why are Wetlands and Water Storage/Retention a Priority Concern?

Wetlands in Pope County serve many important functions, including: flood attenuation, wildlife habitat, improved water quality, recreational opportunities and aesthetics. Although many of the County's Type 3 or larger wetlands remain, most of the County's Type 1 and 2 wetlands have been drained for agricultural production. Much of the wetland draining in the County occurred in the 1960s and early 1970s, when the Federal government's farm policies compensated agricultural producers up to 90 cents on the dollar to install artificial drainage systems. As result of these Federal government payments and policies, an extensive artificial drainage system was installed in Pope County. Recent developments in USDA's "Swampbuster" guidelines have led to a recent rise in agricultural wetland mitigation.

Wetlands Conservation Act

In 1991, the Minnesota Legislature passed Chapter 354, the Wetlands Conservation Act (WCA), which created a statewide "no-net loss" policy for wetlands (refer to Minnesota Rules 8420). The law requires anyone 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, replace any lost wetland acres, functions and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation. A WCA exemption means the wetland area is exempt from the replacement provisions of WCA. It does not make it "free from regulation".

The WCA recognizes a number of wetland benefits deemed important, including:

- Water quality, including filtering pollutants out of surface water and groundwater, using nutrients that would otherwise pollute public waters, trapping sediments, protecting shoreline, and recharging groundwater supplies;
- Floodwater and stormwater retention, including reducing the potential for flooding in the watershed;
- Public recreation and education, including hunting and fishing areas, wildlife viewing areas, and nature areas;
- Commercial benefits, including wild rice and cranberry growing areas and aquaculture areas;
- Fish and wildlife benefits; and
- Low-flow augmentation during times of drought.

What are the Risks Involved with Wetlands/Water Retention and Who/What is at Risk?

There are numerous water quality and quantity concerns directly related to wetlands and/or water retention issues. Their main water quantity value stems from the increasingly important water management philosophy of allowing water to be absorbed into the ground where it falls. Not only does this avoid overloading ditch systems and streams, thereby reducing erosion and flooding issues, they also provide an extremely valuable source of groundwater recharge. From a water quality perspective, wetlands provide a natural basin for stormwater management, acting as high effective filters. The vegetation found in wetlands help to remove phosphorous. This helps to minimize the unwanted growth of aquatic weeds and algae, which end up using the oxygen that plants and animals need to survive.

Who is affected most by Wetlands and Water Storage/Retention?

Retaining water in the upland will reduce the quantity and improve the quality of the water entering Pope County waterbodies. Water storage and retention practices will also help to reduce the quantity of water during peak flows, which can prevent damage to a waterbodies banks. In addition, residents and landowners located in floodplain zones would benefit from reduced peak flood elevations which can help to prevent damage to their property from overland flooding.

Where are Wetland/Water Retention concerns in Pope County?

Today, due in part to regulations such as the WCA, the loss of wetlands has been greatly reduced. The State's Protected Waters Inventory, the Federal Swampbuster Act, and Section 404 of the Clean Water Act also largely contribute to protecting wetland resources. In addition, conservation programs, such as the Wetland Reserve Program (WRP) and Reinvest in Minnesota Program (RIM), provide landowners an opportunity to restore previously drained wetlands along with preserving existing wetlands. These programs, and others like them, should continue to be promoted to landowners within Pope County. Wetland restorations should also be targeted in conjunction with drainage ditch system improvements to assist with flood mitigation, water retention, and stormwater management.

What actions are needed to properly address Wetlands/Water Retention issues in Pope County? -

The Minnesota Department of Agriculture (MDA) summarizes the issues best (please refer to the MDA's Priority Concerns Input Form letter submitted for Pope County in Appendix B and corresponding MDA website): "Properly locating wetlands and water storage or retention projects can be a strategic component of overall efforts to manage nutrients, sediments and water quantity issues. Counties may consider consulting with the Red River Watershed Management Board – Flood Damage Reduction Workgroup to determine how flood damage reduction, retention and mitigation efforts have progressed in Northwest Minnesota in conjunction with wetland restoration (via various state and federal programs). The Red River Valley has a long history of managing floodwater and constructing impoundments to manage floodwaters and significant insight could be gained by corresponding with this organization regarding water retention.

A Technical and Scientific Advisory Committee as part of this Board has also developed a number of scientific papers on a variety of issues related to flood damage reduction. Specifically, counties should consider:

- Conducting/updating culvert inventories in conjunction with identifying where water retention projects can be constructed utilizing LIDAR and GIS technologies.
- Identifying projects where tile water from public drainage systems can potentially be used to augment long-term water levels in wetland restorations for water retention purposes.
- Working with local farmers on agricultural wetland mitigation banking initiatives and include agricultural sectors on overall wetland planning efforts.
- Identify areas where constructed wetlands can be located for treating tile drainage water” (<http://www.mda.state.mn.us/protecting/waterprotection/waterplanning/agdrainage.aspx>).

The Pope County Soil and Water Conservation District (SWCD) administers WCA locally. The Minnesota Board of Water and Soil Resources (BWSR) directs local governmental units statewide, provides technical assistance for WCS and oversight of the banking program. The Pope County Water Management Task Force identified a number of Action Steps that will assist with both wetland protection and water retention. This includes providing educational, technical, and financial assistance to landowners to preserve and restore wetlands and grassland complexes. In addition, the County will pursue grants or easement opportunities to assist landowners in protecting remnant mesic wetlands not protected under State and Federal laws. Pope County will also inventory potential priority wetland restoration sites using ARC GIS LiDAR, hydric soils layers, GIS Data layers, and other tools available.

Finally, the Water Management Task Force created an Action Step aimed at managing water levels in shallow lakes. Specifically, the County will pursue grants to install water control structures to manage the level of water within shallow lakes to improve nutrient filtration by increasing aquatic vegetation and invertebrates populations within these water bodies and improve waterfowl habitat.

J. Shoreland Management Assessment

What is the Concern? Properly managing shoreline restorations in Pope County in order to minimize pollution and to protect water and wildlife resources.

Why is Shoreland Management a Priority Issue?

The Legislature of Minnesota has delegated responsibility to local governments of the state to regulate the subdivision, use and development of the shorelands of public waters and thus preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources. Restoring the waterbodies banks is essential to reducing sediment deposits and decreasing turbidity in the systems thereby improving water quality.

Where is Shoreland Management a concern?

Shoreland management issues are primarily located in the developed lakeshore communities and on the numerous individual cabins and lakeshore homes. It also is a concern along the County's major rivers and streams.

Who is affected most by Shoreland Management issues?

Shoreland owners are not the only stakeholders affected by shoreland management issues. The general public also has a vested interest in protecting shorelands for a variety of environmental, economic and recreational reasons. Proper shoreland management helps to maintain cleaner lakes and streams, thereby facilitating quality wildlife habitat and a better environment for recreational activities. Restoring the banks of public waters benefits the general public by improving the water quality of the waterbodies in Pope County. Pope County Land and Resource Management is responsible for the administration and enforcement of County's Shoreland Management Ordinance.

What would happen if Shoreland Management is not addressed (What is the Risk)?

The uncontrolled use of shorelands in Pope County, affects the public health, safety, and general welfare not only by contributing to pollution of public waters, but also by impairing the local tax base. Therefore, it is in the best interests of the public health, safety, and welfare to provide for the wise subdivision, use, and development of shorelands of public waters. Leaving impacted stretches of waterbodies to further erode, will increase the turbidity of our waterbodies and result in a loss of land from bank sloughing.

Section Three: Groundwater Quality & Quantity

K. Wellhead Protection Areas Assessment

What is the Concern? The protection of wellhead management areas from potential pollution sources.

Why is it a Concern? According to the Minnesota Department of Health (www.health.state.mn.us), wellhead protection is a way to prevent drinking water from becoming polluted by managing potential sources of contamination in the area which supplies water to public water supplies.

Where is it a Concern?

Transient Non-community Public Water Systems: Transient non-community water systems (such as resorts, restaurants, and churches) are required to delineate a 200-foot radius around the well, known as an inner wellhead management zone, and then inventory and manage potential contaminant sources within the inner wellhead management zone. These are the only required wellhead protection steps for transient non-community public water systems (although they are encouraged to pursue additional wellhead protection activities).

Community and Non-transient, Non-community Public Water Systems: Community and non-transient non-community public water systems are required to delineate, inventory, and manage an inner wellhead management zone. Additionally, they must also create a formal wellhead protection plan. The wellhead protection planning process itself is broken down into two parts. Part 1 involves delineation of the wellhead protection area and drinking water supply management area, as well as an assessment of the well(s) vulnerability. Part 2 involves the creation of the wellhead protection plan itself, including goals, objectives, plan of action, evaluation program, and contingency plan.

Who is affected most by the Concern? Public water suppliers (including certain businesses with public water supplies) are the primary stakeholders who coordinate Wellhead Protection Plans. The Minnesota Department of Health is the primary stakeholder on the State level with Wellhead Protection Planning oversight. The Minnesota Pollution Control Agency also is a key stakeholder, as they help to define what levels of pollutants are acceptable to human health.

What would happen if the concern is not addressed? Wellhead Protection Plans are required by state law. In addition, ensuring that public water suppliers have adequate and safe water supplies is a basic water planning activity that impacts all people. As a result, the Pope County Water Management Task Force created an Action Step to assist the Minnesota Department of Health and municipalities with the preparation and implementation of wellhead protection plans for public water suppliers.

L. Drinking Water Quality Assessment

What is the Concern? Ensuring that Pope County has an adequate supply of safe drinking water.

Why is it a Concern? According to the National Academy of Sciences, each person requires between 20 to 50 liters of clean, safe water a day for drinking, cooking, and bathing (www.drinking-water.org). Consequentially, groundwater quality issues are at the forefront of our environmental protection efforts. The numerous multiple uses of groundwater, also raises groundwater quantity concerns. Live stock producers and numerous businesses and industries are also dependent upon adequate groundwater supplies.

Where is it a Concern? There is beginning to be increasingly more information available on both groundwater quality and quantity for Pope County. There are numerous stakeholders who are involved with groundwater issues, including the Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency, the Minnesota Department of Health, Minnesota Geological Survey, and the Minnesota Department of Agriculture. Their major roles regarding groundwater are briefly summarized.

The Minnesota Department of Natural Resources (DNR)

The Minnesota Department of Natural Resources (DNR) monitors the use of the State's water and allocates resources to assure there is sufficient quality and quantity to supply the needs for future generations. Under the observation well network program, groundwater levels are routinely measured in 1,500 wells statewide. The primary objectives of the observation well network are to:

- Place wells in areas of future or present high groundwater use while considering variations in geologic and other environmental conditions;
- Identify long-term trends in groundwater levels;
- Detect significant changes in groundwater levels;
- Provide data for evaluation of local groundwater complaints;
- Provide data to resolve allocation problems; and
- Identify target areas that need further hydrogeologic investigation, water conservation measures, or remedial action.

To access the DNR's groundwater data, visit the following website:

http://www.dnr.state.mn.us/waters/groundwater_section/obwell/waterleveldata.html

The DNR also issues groundwater appropriation permits and investigates any well interference problems.

Minnesota Department of Health

The Minnesota Department of Health maintains the County Well Index database which has water-level data, such as location, depth, and static water level, from more than 300,000 wells statewide. The data is made available online and can search by aquifer type. To access this data online, visit the following website:

<http://www.health.state.mn.us/divs/eh/cwi/>

Minnesota Department of Health also maintains water-quality information for approximately 16,000 public water supply wells. They also take the lead on assisting communities with preparing Wellhead Protection Plans, which are designed to protect public drinking water supplies. This information can be accessed at the following website:

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

Minnesota Pollution Control Agency

In 1989, the Minnesota Pollution Control Agency (MPCA) received a grant from the Legislative Commission on Minnesota Resources (LCMR) to redesign Minnesota's ambient groundwater monitoring program. The resulting program was called the Groundwater Monitoring and Assessment Program (GWMAP). GWMAP's primary objective was to meet statewide and local groundwater quality information needs. For over a decade the program endeavored to answer five basic questions about Minnesota groundwater quality:

1. What are background concentrations of chemicals in Minnesota's groundwater?
2. Where is the groundwater impacted by human activities?
3. What is the nature and severity of the impact?
4. Why is the groundwater impacted?
5. What can be done to minimize groundwater impacts?

Three components were created to facilitate answering these questions. The first component was a statewide baseline assessment of water quality in Minnesota's principal aquifers, conducted from 1990-1996. The second component involved conducting groundwater trend studies. The staff of GWMAP conducted a series of discussions and determined that changes in land use could be linked to trends in water quality. Consequently, GWMAP designed and conducted a variety of land use studies between 1996 and 2001. Groundwater studies were conducted

throughout the State to evaluate impacts from different land use management strategies. The third and final component of GWMAP was the development of regional cooperatives. Between 1992 and 2001, GWMAP staff provided groundwater data and information to a variety of people and groups, as well as technical support to local groups conducting groundwater monitoring. The GWMAP program was discontinued in the summer of 2001; however the results are still available by visiting the following website:

<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/groundwater/groundwater-monitoring-and-assessment/index.html>

Minnesota Department of Agriculture

The Minnesota Department of Agriculture (MDA) monitors groundwater for the presence of agricultural chemicals. In addition, the MDA provides technical information and financial assistance to implement specific water-quality Best Management Practices (BMPs).

MDA Nitrate Water Testing Program - In 1993, the Minnesota Department of Agriculture developed a “walk-in” style of water testing clinic with the goal of increasing public awareness of nitrates in rural drinking and livestock water supplies. Results from the testing not only educate the participants but may also provide some broad information on the occurrence of nitrate ‘hotspots’ across the State; this could eventually aid in justifying nitrate monitoring networks/programs. The clinic concept revolves around a number of simple principles: local participation is critical; testing is free to the public with immediate results; the overall program needs to be inexpensive; a non-regulatory atmosphere is important and well owners may remain anonymous; and the staff’s most important goal is to provide the required technical assistance across a diverse audience of well owners.

Since the beginning of the program, the Nitrate Water Testing Program has provided testing services and educational outreach to over 50,000 well owners. The concept has proven adaptable for county fairs, field day events, public school programs and ‘stand alone’ events. Past sponsors have been the Soil and Water Conservation Districts, U of M Extension Service, county health or environmental health services, county water planning, public schools, lake associations and farm organizations.

The MDA also submitted a Priority Concerns Input Form (found in Appendix B), that provided a number of key implementation suggestions for Pope County’s Water Plan. Of special significance, the MDA submitted a map showing Pope County’s Water Table Sensitivity. This map, shown on the next page, classifies the County into three aquifer sensitivity ratings: low,

medium, and high. These reflect the likelihood that infiltration precipitation or surface water would reach the water table, potentially polluting the groundwater with surface contaminants.

Who is affected most by the Concern?

Typically poor drinking water supplies primarily affect children and seniors the most, due to their increased susceptibility to water-borne illness. Having clean and adequate water supplies, however, is an essential component to everyone's health, including both people and animals.

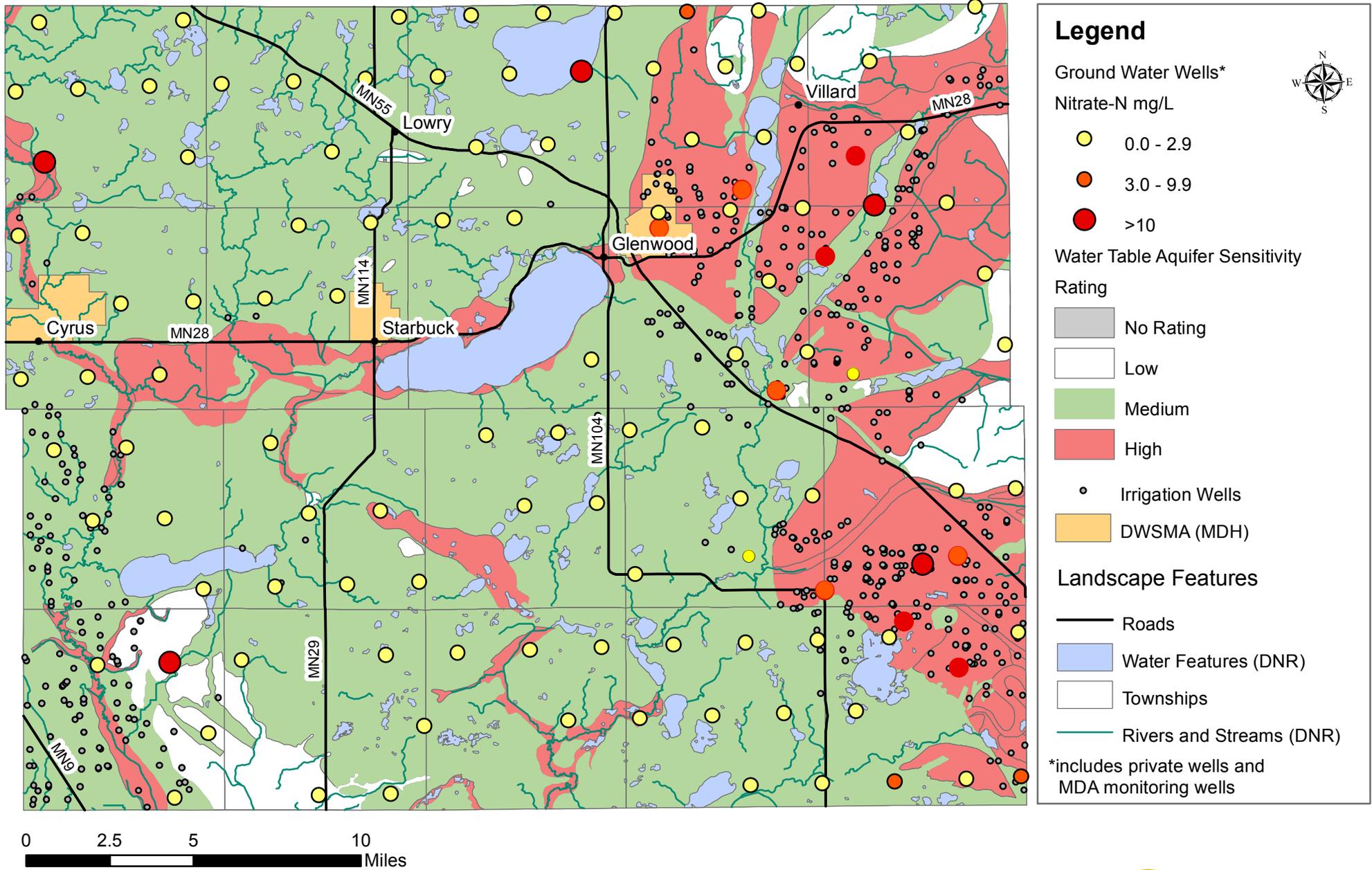
What would happen if the concern is not addressed?

If measures are not taken to properly address groundwater supplies, groundwater contamination is likely to occur. Implementing Best Management Practices in relationship to groundwater recharge rates would be a large step towards protecting the County's long-term groundwater supplies.

Current groundwater quality monitoring efforts by the Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH) and the Minnesota Pollution Control Agency (MPCA) and other stakeholders should be continued and expanded within the Pope County. More importantly, any important conclusion on the results of these monitoring efforts should be shared with the County's Water Management Task Force.

POPE COUNTY WATER TABLE AQUIFER SENSITIVITY

Water Table Aquifer Sensitivity based on Sediment Association of Minnesota Geomorphology (DNR, 1997)



Pope County is committed to continuing to use groundwater monitoring data to help support land use decisions and to prioritize educational efforts. An Action Step was created to create a groundwater BMP Program, which would provide educational, technical and financial assistance, as available, to communities and landowners for the implementation of groundwater protection BMPs. Examples include promoting livestock manure management; SSTS upgrades; properly sealing abandoned wells; properly decommissioning storage tanks; implementing conservation easements, such as CRP contracts; and the proper application and disposal of pesticides and other chemicals.

M. Irrigation Management Assessment

What is the Priority Concern and why? Shallow/inadequate supplies of groundwater combined with agricultural irrigation pressures. Contrary to popular belief, groundwater supplies are not infinite. This problem is compounded by the problem of poor surface water management issues, which commonly push water quickly downstream rather than allow water to recharge back into groundwater supplies. In addition, a number of agricultural practices can contribute to groundwater pollution. Potential contamination sources include pesticides, fertilizers, and livestock waste.

Where in the County is it a Priority Concern?

According to the County's Hydrogeologic Atlas, which can be viewed online at http://files.dnr.state.mn.us/waters/groundwater_section/mapping/cga/c15_pope/pdf_files/plate06.PDF, most groundwater in Pope County is pumped from unconsolidated bodies of sand and gravel. This is similar to the other counties in Western and Central Minnesota. Eastern Pope County is dominated by a portion of one of the largest surficial sand deposits in the state: the Belgrade-Glenwood sand plain, which is a major source of irrigation water in the region. The northern Chippewa River sand plain in southwestern Pope County is another important irrigation district in the region. Beneath these surficial aquifers are layered glacial deposits that contain other important groundwater supplies for the County

The eastern portion of Pope County, referred to as Bonanza Valley, is considered an area of high groundwater concern. This area, which extends into Stearns and Kandiyohi counties,

“has been considered to be water rich and, until recently, has supported extensive agricultural irrigation and other users without apparent problem. However, the water is supplied from a complex system of glacial drift aquifers which interact with surface waters. Potential impacts to ecological services are not fully understood. Several years of reduced precipitation and increased irrigation have resulted in some water use conflicts. The extent of these conflicts was brought to light during recent investigation by DNR

hydrologists into well interference complaints by domestic well owners. Previous US Geological Survey and DNR studies...indicated a strong connection between ground water and surface water. These studies were primarily focused on determining how much water was available to be removed without consideration of impacts of withdrawals on the entire hydrologic and ecologic system. The current studies are aimed at assessment and identification of recharge areas including potential quantity and quality vulnerabilities and will leverage updated and expanded aquifer data and maps from county geologic atlases, biologic surveys and regional basin studies, and ongoing water quality analyses to update and enhance earlier hydrologic models. In the Bonanza Valley study area data gathering has included three mass well water level measurements, installation of several shallow wells to create well nests or replace existing observation wells, and stream flow measurements at locations close to those used in the earlier studies.”

(Minnesota Ground water Association www.mgwa.org December 2009 Volume 28, Number 4).

Who is affected most by the Priority Concern? The agricultural community depends upon access to a reliable supply of groundwater to properly irrigate crops and for increasing livestock demands. Nearby wells are affected if groundwater supplies are not adequate. In addition, groundwater supplies are vulnerable to pollution from a variety of chemical and poor land management sources.

What would happen if the Priority Concern was not addressed and what can be done? As population and agricultural demands on groundwater expand, there will be an increasing number of groundwater conflicts and pollution sources in the future. The Pope County Water Plan Task Force should consider the following Action Step possibilities:

- Promote groundwater Best Management Practices and cost-share key projects.
- Assist with cost-sharing the conversion of conventional irrigation systems to conservation techniques.
- Prioritize protecting and restoring surface water features in sensitive groundwater recharge areas.

Chapter Three: Pope County Water Plan Goals, Objectives & Action Steps (2013-2018)

This Chapter establishes the Pope County’s Water Plan Goals, Objectives, and Action Steps. Although the Water Plan will cover a span of 10 years (2013-2023), this Chapter of the Plan will guide the County in water resource management efforts over the first five years (2013-2018). Each Action Step has been assigned specific implementation information, including the priority watershed (if one was identified), stakeholders involved, and an estimated cost to implement the activity.

A. Definition of Goals, Objectives, and Action Steps

The Goals, Objectives, and Action Steps that are identified in this Chapter were developed with input from the public, various State and local governmental units/agencies, and the Pope County Water Plan Taskforce. The following provides a definition of these terms:

Goal: A goal is an idealistic statement intended to be attained at some undetermined future date. Goals are purposely general in nature.

Objective: An objective is an action-oriented statement that supports the completion of a goal. There may be more than one objective per goal.

Action Step: An Action Step is a specific activity that will be taken in order to achieve a goal and objective.

B. Action Step Information

Each Action Step identified in this Chapter has been assigned specific information on priority watershed(s), stakeholders involved, and the activity’s estimated cost. In addition, if a specific time-frame was identified (i.e., when the Action Step should be completed by), this was communicated by placing a year in parenthesis in the Action Item. For example, if (2015) appears in the Action Step, this means the activity ideally would take place (or at least begin) in 2015. If a year is not indicated, the Action Step is intended to be implemented on an ongoing or annual basis. The following Action Step descriptions also apply:

Priority Watershed(s): Details the areas within the County where the implementation of the initiative shall take place. “All” is listed for countywide implementation.

Stakeholder(s): This entails who potentially will be involved in the implementation of the identified initiative. An *Asterisk and Underline indicates lead responsibility. A listing of the most common coordinating agencies and their respective acronyms is provided:

All (refers to all water plan stakeholders)

Cities (Cities)

County (County)

- County Board (CB)
- Ditch Authority (DA)
- Land and Resource Management (LRM)
- Pope Douglas Solid Waste (PDSW)
- Public Health (PH)
- Public Works (PW)
- Soil and Water Conservation District (SWCD)
- Water Plan Task Force (WPTF)

Minnesota Board of Water and Soil Resources (BWSR)

Minnesota Department of Agriculture (MDA)

Minnesota Department of Health (MDH)

Minnesota Department of Natural Resources (DNR)

Minnesota Geological Survey (MGS)

Minnesota Department of Transportation (MnDOT)

Minnesota Pollution Control Agency (MPCA)

Natural Resources Conservation Service (NRCS)

Pope County Coalition of Lakes (COLA)

University of Minnesota Extension (UME)

United States Army Corps of Engineers (USACE)

United States Department of Agriculture (USDA) – Farm Service Agency (FSA)

United States Fish and Wildlife Service (USFWS)

Watersheds and Watershed Management-Like Organizations (WMLOs)

- Chippewa River Watershed Project (CRWP)
- Sauk River Watershed District (SRWD)
- North Fork Crow River Watershed (NFCRWD)
- Watershed Districts (WD)

Estimated Cost: This category divides the estimated costs of completing the Action Step into two columns: Overall and County. The Overall column provides an estimate of the total cost among all stakeholders (i.e., grants, cost-share, County match, etc.) to implement the Action Step. The County column represents the estimated cost incurred either directly or indirectly by Pope County to implement the Action Step, including by the Pope County SWCD. If an Action Item’s cost could not be estimated, a TBD appears in the column, which stands for To-Be-Determined. The costs are estimated over the five-year implementation time-span, which covers the period of 2013-2018. The tables also show the average annual amount which is simply the overall estimated costs divided by five.

C: Goals, Objectives & Action Steps (2013-2018)

GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS				
Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective A: Protect Pope County's surface waters from being listed on MPCA's 303d List of Impaired Waters.				
Countywide	<p>1.A.1. Surface Water Quality Monitoring. Work with stakeholders to monitor surface water quality.</p> <p>1.A.1.a) Annually review available surface water quality data, such as the MPCA's Secchi transparency trend analysis and watershed project/district reports. Prioritize projects and Best Management Practices (BMPs) based upon the information.</p> <p>1.A.1.b) Continue lake monitoring efforts on the following 19 lakes, ranked from best to worst in total phosphorus: 1) Maple 2) Amelia 3) Signalness 4) Scandinavian 5) Linka 6) Minnewaska-E 7) Minnewaska-W 8) Grove 9) Villard *10) Reno *11) Pelican *12) Leven *13) Gilchrist 14) Johanna 15) Westport *16) Strandness *17) Emily *18) Malmedahl *19) Ann</p> <p>*8 Lake TMDL</p>	*WMLOs, SWCD, WPTF, MPCA, DNR, COLA, CRWP, NFCRWD, SRWD	\$100,000	\$10,000
Countywide	<p>1.A.2. Surface Water Quality Profiles. Work with stakeholders to profile surface water quality.</p> <p>1.A.2.a) Seek opportunities to refine watershed analysis and management strategies using detailed GIS information, water quality data, and other tools to guide plan actions, target implementation and augment funding from outside sources.</p>	*SWCD, WMLOs	\$20,000	\$5,000
Countywide	<p>1.A.3. Alternative Shoreland Management Ordinance. Adopt the Alternative Shoreland Management standards that are currently being discussed statewide once they become available.</p>	*CB, *LRM	\$30,000	\$10,000

Objective A continued...

Objective A continued...

GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS				
Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective A: Protect Pope County's surface waters from being listed on MPCA's 303d List of Impaired Waters.				
Chippewa River Watershed	<p>1.A.4. Lake Minnewaska. Implement water quality BMPS to protect and enhance Lake Minnewaska.</p> <p>1.A.4.a) Complete a full inventory of the ravines along the south shore of Lake Minnewaska. With landowner permission, evaluate their condition and prioritize for potential projects.</p> <p>1.A.4.b) Survey and develop preliminary plans to repair and enhance the ravines. Pursue Clean Water Funding to implement priority projects. Target and implement twenty (20) water quality BMPs.</p>	*SWCD, CRWP	\$250,000	\$50,000
<i>Objective A Average Annual Costs</i>			\$80,000	\$15,000
<i>Objective A 5-Year Overall Estimated Costs</i>			\$400,000	\$75,000

GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective B: Remove Pope County's water bodies from the MPCA's 303d List of Impaired Waters by 2030.				
Chippewa River Watershed	<p>1.B.1. Ann Lake TMDL. Reduce annual total phosphorus levels by 5,000 pounds (target reduction goal is 10,929 pounds by 2030).</p> <p>1.B.1.a) Establish one (1) vegetative shoreland buffer in a critical area.</p> <p>1.B.1.b) Cooperatively work with stakeholders to restore two (2) wetlands.</p> <p>1.B.1.c) Install two (2) ag waste BMPs in the Ann Lake subwatershed.</p> <p>1.B.1.d) Install ten (10) alternative tile intakes.</p>	*SWCD, LRM, MPCA, WMLOs	\$150,000	\$30,000
Chippewa River Watershed	<p>1.B.2. Lake Emily TMDL. Reduce annual total phosphorus levels by 2,000 pounds (target reduction goal is 6,415 pounds by 2030).</p> <p>1.B.2.a) The lakeshed shall be considered high-priority for shoreland and stream restorations. Implement two (2) projects.</p> <p>1.B.2.b) Continue to examine the costs-benefits of restoring a portion of the Little Chippewa River. Ensure that landowner concerns are properly identified and mitigated (2013).</p> <p>1.B.2.c) Restore two (2) wetlands.</p> <p>1.B.2.d) Install five (5) sediment basins.</p> <p>1.B.2.e) Target BMP programs and implementation in the Little Chippewa River subwatershed upstream of Minnesota Trunk Highway 28. Implement ten (10) BMP projects.</p>	*SWCD, LRM, MPCA, WMLOs	\$75,000	\$20,000

Objective B continued...

Objective B continued...

Chippewa River Watershed	<p>1.B.3. Gilchrist Lake TMDL. Reduce annual total phosphorus levels by 1,500 pounds (target reduction goal is 4,071 pounds by 2030). 1.B.3.a) Evaluate the Mill Pond along the East Branch of the Chippewa River to determine its role in water quality. 1.B.3.b) Conduct core samples to pursue dredging the Mill Pond. 1.B.3.c) Implement two (2) shoreline restoration projects. 1.B.3.d) Implement \$300,000 in EQiP funds for Ag BMPs. 1.B.3.e) Develop one (1) enhanced Manure Management Plan. 1.B.3.f) Cost-share installing ten (10) alternative tile intakes. 1.B.3.g) Examine land management activities, including the potential to hay vegetative cover. Implement haying and managed grazing if feasible.</p>	*SWCD, LRM, MPCA, WMLOs	\$450,000	\$50,000
Chippewa River Watershed	<p>1.B.4. Lake Leven TMDL. Reduce annual total phosphorus levels by 500 pounds (target reduction goal is 836 pounds by 2030). 1.B.4.a) Evaluate JD4 for water quality and ag BMP needs. 1.B.4.b) Implement two (2) water quality and/or ag BMP projects. 1.B.4.c) Investigate JD4 lateral locations and BMPs.</p>	*SWCD, LRM, MPCA, WMLOs	\$75,000	\$10,000
Chippewa River Watershed	<p>1.B.5. Malmedal TMDL. Reduce annual total phosphorus levels by 500 pounds (target reduction goal is 1,052 pounds by 2030). 1.B.5.a) Conduct a drawdown of the lake. 1.B.5.b) Cost-share installing twenty (20) alternative tile intakes.</p>	*SWCD, LRM, MPCA, WMLOs	\$50,000	\$15,000
Chippewa River Watershed	<p>1.B.6. Pelican Lake TMDL. Reduce annual total phosphorus levels by 500 pounds (target reduction goal is 911 pounds by 2030). 1.B.6.a) Target Trapper’s Run subwatershed for implementing two (2) water quality BMPs. 1.B.6.b) Implement two (2) shoreland restoration projects. 1.B.6.c) Redesign and improve the Trapper’s Run fish barrier sediment basin. 1.B.6.d) Install two (2) additional sediment basins.</p>	*SWCD, LRM, MPCA, WMLOs	\$100,000	\$20,000

Objective B continued...

Objective B continued...

Chippewa River Watershed	<p>1.B.7. Lake Reno TMDL. Reduce annual total phosphorus levels by 350 pounds (target reduction goal is 744 pounds by 2030). 1.B.7.a) Establish 2,000 feet of shoreline vegetative buffers. 1.B.7.b) Implement two (2) shoreland restoration projects. 1.B.7.c) Secure funding for SSTS inspections to identify imminent health threats.</p>	*SWCD, LRM, MPCA, WMLOs	\$60,000	\$15,000
Chippewa River Watershed	<p>1.B.8. Strandness Lake TMDL. Reduce annual total phosphorus levels by 1,000 pounds (target reduction goal is 1,839 pounds by 2030). 1.B.8.a) Target subwatershed for two (2) water quality BMPs.</p>	*SWCD, LRM, MPCA, WMLOs	\$25,000	\$10,000
Chippewa River Watershed	<p>1.B.9 Nutrient Management Plans. Enroll 50% of cropland within impaired subwatersheds into nutrient management plans (the TMDL Plan calls for 75% by 2020).</p>	*NRCS SWCD	\$25,000	\$5,000
Sauk River Watershed	<p>1.B.10 Ashley Creek. Prioritize implementing BMPs until Ashley Creek is delisted from MPCA’s 303d List of Impaired Waters for E.coli and Aquatic Bioassessments. 1.B.10.a) Implement two (2) cattle exclusions. 1.B.10.b) Cost-share incentives to establish 100 acres of vegetative buffer strips. Increase buffer strips to 2-rod where feasible. 1.B.10.c) Implement two (2) bank stabilization projects. 1.B.10.d) Work with producers to update/create two (2) manure management plans. 1.B.10.e) Target SSTS inspections in the subwatershed. 1.B.10.f) Target subwatershed to implement one (1) wetland restoration. 1.B.10.g) Target outreach and educational efforts in the subwatershed.</p>	*SRWD SWCD, LRM	\$100,000	\$10,000

Objective B continued...

Objective B continued...

Sauk River Watershed	<p>1.B.11 Westport Lake. Prioritize implementing BMPs until Westport Lake is delisted from MPCA’s 303d List of Impaired Waters for excessive nutrients.</p> <p>1.B.11.a) Implement two (2) cattle exclusions.</p> <p>1.B.11.b) Implement two (2) water quality shoreline BMPs.</p> <p>1.B.11.c) Work with producers to update/create one (1) manure management plan.</p> <p>1.B.11.d) Target SSTS inspections in the subwatershed.</p> <p>1.B.11.e) Target outreach and educational efforts in the subwatershed.</p>	*SRWD SWCD, LRM	\$75,000	\$10,000
Sauk River Watershed	<p>1.B.12 County Ditch 6. Prioritize implementing BMPs until County Ditch 6 (a tributary to Ashley Creek) is delisted from MPCA’s 303d List of Impaired Waters for excessive nutrients.</p> <p>1.B.12.a) Cost-share incentives to establish 100 acres of vegetative buffer strips. Increase buffer strips to 2-rod where feasible.</p> <p>1.B.12.b) Work with producers to update/create two (2) manure management plans.</p> <p>1.B.12.c) Target outreach and educational efforts in the subwatershed.</p>	*SRWD SWCD, LRM	\$50,000	\$8,000
Countywide	<p>1.B.13 SSTS Inspections. Inspect SSTS for imminent health threats.</p>	*LRM	\$100,000	\$25,000
<i>Objective B Average Annual Costs</i>			\$267,000	\$45,600
<i>Objective B 5-Year Overall Estimated Costs</i>			\$1,335,000	\$228,000

**GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE
WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS**

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective C: Partner with feedlot and livestock producers to identify priority sites to implement agricultural waste Best Management Practices.				
Countywide	1.C.1. County Feedlot Program. Continue to locally administer the County Feedlot Program to assist feedlot operators in obtaining and maintaining compliance with State regulations. 1.C.1.a) Target feedlot inspections in shoreland areas. 1.C.1.b) Inspect a minimum of 10% or 30 sites annually. 1.C.1.c) Work with feedlot operators on registering sites (2013, 2017).	*LRM, MPCA	\$150,000	\$20,000
Countywide	1.C.2. Feedlot Education. Continue educational efforts focusing on current regulations, permit issues, and BMP programs. 1.C.2.a) Host an annual educational meeting with feedlot operators. 1.C.2.b) Include information in four (4) quarterly newsletters.	*LRM, SWCD, MPCA	\$5,000	\$1,000
Countywide	1.C.3. Cattle Exclusions. Identify sites where cattle exclusions are needed. 1.C.3.a) Cost-share five (5) cattle exclusion BMPs.	*LRM, MPCA	\$50,000	\$5,000
Chippewa River Watershed	1.C.4. Impaired Watershed Inspections. Prioritize annual inspections in Impaired Watersheds. 1.C.4.a) Implement five (5) ag waste BMPs in impaired subwatersheds.	*LRM, SWCD, MPCA	\$90,000	\$18,000

Objective C continued...

Objective C continued...

Countywide	<p>1.C.5. County Feedlot BMP Implementation Program. Work with feedlot operators to implement ag waste/feedlot BMPS.</p> <p>1.C.5.a) Implement two ag waste/nutrient management plans per year.</p> <p>1.C.5.b) Provide low interests loans for noncompliant feedlots. Target five (5) annually.</p> <p>1.C.5.c) Secure cost-share funding that includes technical assistance to install ag BMPs and nutrient management plans.</p>	*CRWP, LRM, SWCD, NRCS, MPCA	\$300,000	\$75,000
Chippewa River Watershed	<p>1.C.6. Chippewa River Watershed Project Feedlot Initiatives. Work with feedlot operators to implement ag waste/feedlot BMPS.</p> <p>1.C.6.a) Provide a \$2,000 cash incentive to producers with less than 300 animal units to develop Manure Management Plans.</p> <p>1.C.6.b) Purchase scale pads to be used by the SWCD to assist producers with better calibration of solid manure application equipment (by 2014).</p> <p>1.C.6.c) Provide \$4,000 to the SWCD to inventory producers with less than 300 animal units.</p> <p>1.C.6.d) Upgrade five (5) feedlots with BMPs to eliminate runoff to nearby bodies of water.</p> <p>1.C.6.e) Provide \$2,500 to cost-share the closure of five (5) waste impoundments, such as lagoons or ponds, that are no longer being used for their intended purposes.</p> <p>1.C.6.f) Promote 1,000 acres of pasture management by implementing BMPs such as stream crossings, fencing, remote water systems, managed grazing plans, etc.</p> <p>1.C.6.g) Host a workshop on the importance of correct manure application.</p> <p>1.C.6.h) Host a field day on the importance of correct manure management.</p>	*CRWP, LRM, SWCD, NRCS, MPCA	\$120,000	\$7,500
<i>Objective C Average Annual Costs</i>			\$143,000	\$25,300
<i>Objective C 5-Year Overall Estimated Costs</i>			\$715,000	\$126,500

**GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE
WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS**

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective D: Identify and mitigate pollution caused by wastewater and failing Subsurface Sewage Treatment Systems (SSTS).				
Countywide	1.D.1. County SSTS Program. Continue to locally administer the County's SSTS Program. 1.D.1.a) Work with 70 landowners annually on compliance inspections for new or existing systems. 1.D.1.b) Host an annual meeting with SSTS installers and septage haulers. 1.D.1.c) Semiannually publish information in local newspapers and/or newsletters.	*LRM, MPCA, WMLOs	\$250,000	\$150,000
Countywide	1.D.2. Noncompliant Upgrades. Secure financial assistance programs to provide assistance for homeowners to upgrade noncompliant SSTSs. 1.D.2.a) Upgrade 10 noncompliant SSTS annually.	*LRM, MPCA, WMLOs	\$750,000	\$150,000
Chippewa River Watershed	1.D.3. Chippewa River Watershed Project. Work with landowners to comply with SSTS regulations. 1.D.3.a) Secure MPCA and MDA funding to provide low interest loans to upgrade noncompliant SSTS. 1.D.3.b) Cost-share upgrading four (4) low income noncompliant systems annually. 1.D.3.c) Inspect all SSTS in impaired sub watersheds.	*CRWP, LRM, SWCD MPCA, MDA	\$300,000	\$60,000
Objective D Average Annual Costs			\$260,000	\$72,000
Objective D 5-Year Overall Estimated Costs			\$1,300,000	\$360,000

**GOAL 1: TO ENSURE THAT POPE COUNTY'S SURFACE
WATER RESOURCES EXCEED MINIMUM WATER QUALITY STANDARDS**

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective E: Work with stakeholders to control and prevent the spread of Aquatic Invasive Species in Pope County.				
Countywide	1.E.1. County AIS Program. Provide educational and financial assistance, as available, on AIS prevention methods.	*CB, DNR COLA	\$50,000	\$10,000
Countywide	1.E.2. Annual AIS Meeting. Host an annual AIS public informational meeting with assistance from the Department of Natural Resources.	*WMLOs, DNR COLA	\$15,000	\$7,500
Countywide	1.E.3. AIS Task Force. Create a local AIS Task Force (2013).	*CB, DNR COLA	\$25,000	\$25,000
Objective E Average Annual Costs			\$18,000	\$8,500
Objective E 5-Year Overall Estimated Costs			\$90,000	\$42,500

GOAL 2: TO REDUCE SOIL EROSION AND SEDIMENTATION

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective F: Work with landowner to identify priority sites to implement erosion and sediment control Best Management Practices.				
Countywide	<p>2.F.1. SWCD BMP Program. Provide educational, technical, and financial assistance, as available, to landowners for the implementation of erosion and sediment control BMPs.</p> <p>2.F.1.a) Install 100 acres of vegetative buffer filter strips annually.</p> <p>2.F.1.b) Install three (2) water and sediment control structures annually.</p> <p>2.F.1.c) Install five (5) alternative tile intakes.</p> <p>2.F.1.d) Install 500 feet of living snow fences annually.</p> <p>2.F.1.e) Install five (5) streambank stabilization projects annually.</p>	*SWCD, MPCA	\$120,000	\$22,000
Countywide	<p>2.F.2. Conservation Tillage. Promote conservation tillage and increase by 1,000 acres annually throughout the County.</p> <p>2.F.2.a) Publish two (2) newspaper articles annually.</p> <p>2.F.2.b) Include information in four (4) quarterly newsletters.</p> <p>2.F.2.c) Conduct an annual Conservation Tillage Workshop.</p> <p>2.F.2.d) Conduct Tillage Transect Surveys (2014, 2016, 2018).</p> <p>2.F.2.e) Make no till drills available to landowners/renters.</p>	*SWCD	\$7,500	\$1,500
Countywide	<p>2.F.3. SWCD Tree Program. Continue with and expand the SWCD's Conservation Tree Program.</p> <p>2.F.3.a) Establish two miles of windbreaks annually.</p> <p>2.F.3.b) Install five miles of weed control fabric annually.</p> <p>2.F.3.c) Produce two annual publications promoting the Tree Program.</p> <p>2.F.3.d) Establish ten (10) farmstead shelterbelts annually.</p>	*SWCD	\$192,000	\$38,000

Objective F continued...

Objective F continued...

Countywide	2.F.4. Soil Health. Promote soil health by encouraging cover crops, no-till/minimum till, grazing, etc.). 2.F.4.a) Publish information in quarterly newsletters. 2.F.4.b) Target marginal land for BMP programs.	*SWCD, NRCS	\$2,500	\$500
Chippewa River Watershed	2.F.5. SWCD BMP Program. Provide educational, technical, and financial assistance, as available, to landowners for the implementation of erosion and sediment control BMPs. 2.F.5.a) Install five (5) water and sediment control basins annually in the Little Chippewa River subwatershed. 2.F.5.b) Install five (5) water and sediment control basins annually in the Main Branch Chippewa River subwatershed. 2.F.5.c) Implement twenty (20) BMP projects in the south shore Lake Minnewaska subwatershed.	*SWCD, NRCS	\$350,000	\$70,000
Chippewa River Watershed	2.F.6. Hoff Township Project. Secure funding to properly implement a grade stabilization project in Hoff Township less than one mile from the Chippewa River. Project includes side inlets, re-sloping ditch, and establishing buffers.	*SWCD, LRM, NRCS	\$30,000	\$6,000
Sauk River Watershed	2.F.7. Ashley Creek Project. Install one mile of vegetative filter buffer strips per year along Ashley Creek.	*SWCD	\$17,000	\$3,500

Objective F continued...

Objective F continued...

Chippewa River Watershed	<p>2.F.8. Chippewa River Watershed Project Erosion BMPs. Partner with the Chippewa River Watershed Project on promoting and implementing their BMP initiatives to manage erosion and sedimentation.</p> <p>2.F.8.a) Install three (3) terrace projects.</p> <p>2.F.8.b) Install fifteen (15) water and sediment control basins.</p> <p>2.F.8.c) Install ten (10) barbs or j-hooks.</p> <p>2.F.8.d) Provide up to 75% cost-share on intakes and pipe structures to control gully erosion on natural and designed channels.</p> <p>2.F.8.e) Provide a one-time incentive payment of \$1,000 per acre to establish vegetative buffers to a width of 2 rods.</p> <p>2.F.8.f) Promote 2,000 acres of conservation tillage. Provide producers with a \$7 per acre incentive payment for the development and installation of an EQIP conservation tillage plan.</p>	*CRWP, SWCD	\$250,000	\$10,000
<i>Objective F Average Annual Costs</i>			\$193,800	\$30,300
<i>Objective F 5-Year Overall Estimated Costs</i>			\$969,000	\$151,500

**GOAL 3: TO EFFECTIVELY MANAGE SURFACE
WATER RESOURCES FOR MULTIPLE PURPOSES**

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective G: Ensure long-term agricultural production by properly maintaining the public drainage system.				
Countywide	<p>3.G.1. Public Drainage System. Ensure that public drainage systems are operated and maintained in accordance with the State Drainage Law 103E.</p> <p>3.G.1.a) Annually identify where maintenance is needed. Maintain one mile County ditch annually in high erosion areas that are considered damaged.</p> <p>3.G.1.b) Assist with restoring proper flows where needed.</p> <p>3.G.1.c) Redetermine the benefits on systems as requested.</p> <p>3.G.1.d) Complete County Ditch Inventory to include details on each system.</p> <p>3.G.1.e) Identify public and private tile lines that flow into the open ditch system.</p> <p>3.G.1.f) Install five (5) buffers and/or side inlets annually to control erosion and sedimentation and to maintain efficiency.</p>	*CB, PW	\$350,000	\$75,000
Countywide	<p>3.G.2. Conservation Drainage Practices. Provide educational, technical, and financial assistance, as available, to landowners for the installation of conservation drainage practices.</p> <p>3.G.2.a) Implement one (1) project annually.</p> <p>3.G.2.b) Pursue funding to establish a two-stage ditch system test site.</p>	*WMLOs, PW	\$50,000	\$20,000

Objective G continued...

Objective G continued...

Chippewa River Watershed	<p>3.G.3. Chippewa River Watershed Project Drainage BMPS. Provide cost-share to landowners for the implementation of conservation drainage BMPS.</p> <p>3.G.3.a) Provide up to 75% cost-share on intakes and pipe structures to control gully erosion on natural and designed channels. Implement twenty (20) projects.</p> <p>3.G.3.b) Provide up to 75% cost-share to remove open tile intakes and replace with alternative intakes. Implement fifty (50) projects.</p> <p>3.G.3.c) Provide up to 75% cost-share on controlled drainage projects. Implement two (2) projects.</p>	*CRWP, SWCD	\$100,000	\$5,000
Sauk River Watershed	<p>3.G.4. County Ditch 6. Provide cost-share to landowners for the implementation of conservation drainage BMPS along County Ditch 6 (a tributary to Ashley Creek) until the water body is delisted from the MPCA’s 303d List of Impaired Waters for Aquatic Bioassessments.</p> <p>3.G.4.a) Cost-share intakes and pipe structures to control erosion. Implement five (5) projects.</p> <p>3.G.4.b) Cost-share to remove open tile intakes and replace with alternative intakes. Implement five (5) projects.</p> <p>3.G.4.c) Cost-share two (2) controlled drainage projects.</p>	*SRWD, SWCD	\$50,000	\$5,000
<i>Objective G Average Annual Costs</i>			\$110,000	\$21,000
<i>Objective G 5-Year Overall Estimated Costs</i>			\$550,000	\$105,000

**GOAL 3: TO EFFECTIVELY MANAGE SURFACE
WATER RESOURCES FOR MULTIPLE PURPOSES**

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective H: Manage stormwater pollution by identifying key stormwater issues and potential solutions.				
Countywide	<p>3.H.1. Stormwater Management Plans. Participate in the development and implementation of Comprehensive Stormwater Management Plans.</p> <p>3.H.1.a) Apply for funds to develop a Stormwater Management Plan for the City of Starbuck (2014).</p> <p>3.H.1.b) Partner with the City of Glenwood on implementing its Stormwater Management Plan.</p>	*SWCD, MPCA, Cities	\$100,000	\$20,000
Countywide	<p>3.H.2. Stormwater BMPs. Provide educational, technical, and financial support, as available, for the implementation of stormwater BMPs.</p> <p>3.H.2.a) Design and install a minimum of three (3) rain gardens annually.</p> <p>3.H.2.b) Promote the use of semi-permeable surfaces by creating two (2) demonstration sites.</p> <p>3.H.2.c) Assist with creating four (4) stormwater holding ponds. Make one of them a demonstration site.</p> <p>3.H.2.d) Include educational and cost-share information in quarterly newsletters.</p>	*LRM, *SWCD	\$75,000	\$15,000
Countywide	<p>3.H.3 Floodplain Maps. Work with FEMA to convince them to create a new Floodplain Map for Pope County (they currently are not planning to do so over the next five years).</p>	*LRM, CB SWCD, FEMA	\$60,000	\$20,000

Objective H continued...

Objective H continued...

Chippewa River Watershed	<p>3.H.4. Chippewa River Watershed Project Stormwater BMPs. Provide educational, technical, and financial support, as available, for the implementation of stormwater BMPs.</p> <p>3.H.2.a) Cost-share installing three (3) Urban Stormwater Ponds.</p> <p>3.H.2.b) Cost-share installing rain gardens for ten (10) households and Two (2) businesses.</p> <p>3.H.2.c) Cost-share providing 1,000 rain barrels.</p> <p>3.H.2.d) Include educational and cost-share information in quarterly newsletters.</p>	*CRWP SWCD	\$75,000	\$5,000
<i>Objective H Average Annual Costs</i>			\$62,000	\$12,000
<i>Objective H 5-Year Overall Estimated Costs</i>			\$310,000	\$60,000

**GOAL 3: TO EFFECTIVELY MANAGE SURFACE
WATER RESOURCES FOR MULTIPLE PURPOSES**

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective I: Identify opportunities to preserve and restore wetlands and other water retention sites.				
Countywide	3.I.1. Wetland Conservation Act Administration. Continue to locally administer the Minnesota Wetland Conservation Act. 3.I.1.a) Ensure that wetlands are protected or mitigated properly during land use activities.	*SWCD, BWSR	\$80,000	\$40,000
Countywide	3.I.2. Wetland Restorations. Actively restore wetlands where water quality and quantity benefits outweigh the costs. 3.I.2.a) Restore two (2) wetlands annually. 3.I.2.b) Target the impaired subwatersheds for wetland restorations. 3.I.2.c) Increase the number of Wetland Reserve Program easements by two (2) each year by targeting marginal farmland. 3.I.2.d) Promote various wetland banking programs, such the Agricultural Wetland Bank program establish in 2012. Increase the number of wetlands in these programs by one (1) annually.	*SWCD, BWSR, WMLOs	\$300,000	\$20,000
Chippewa River Watershed	3.I.3. Chippewa River Watershed Project Wetland Restorations. Work with stakeholders to restore wetlands in both urban and rural settings. 3.I.3.a) Partner with the U.S. Fish and Wildlife Service to provide up to 90% cost-share or \$10,000, whichever is less, for wetland restorations. 3.I.3.b) Provide landowners with \$1,000 per acre incentive payment for enrollment in programs, such as CRP, RIM, and WRP. 3.I.3.c) Implement five (5) wetland restorations.	*CRWP, BWSR SWCD	\$75,000	\$5,000
Objective I Average Annual Costs			\$91,000	\$13,000
Objective I 5-Year Overall Estimated Costs			\$455,000	\$65,000

**GOAL 3: TO EFFECTIVELY MANAGE SURFACE
WATER RESOURCES FOR MULTIPLE PURPOSES**

Priority Watershed	Action Step	Stakeholders <i>*Local Lead</i>	5-Year Estimated Costs	
			Overall	Local
Objective J: Identify where shoreland restorations are needed.				
Countywide	<p>3.J.1. Shoreland Restorations. Provide educational, technical and financial resources, when available, on proper shoreland management and restoration BMPs.</p> <p>3.J.1.a) Use LIDaR and GIS technology to annually identify potential sites.</p> <p>3.J.1.b) Examine alternatives to using rip-rap during shoreland restorations.</p> <p>3.J.1.c) Cost-share two (2) shoreland restorations annually.</p> <p>3.J.1.d) Secure funding to create two (2) shoreland restorations demonstration sites.</p> <p>3.J.1.e) Cost-share shoreland restoration products, such as bio-logs, aquatic plugs, native seeding, etc.</p>	*LRM, SWCD, MWLOs, COLA, DNR	\$50,000	\$10,000
Chippewa River Watershed	<p>3.J.2. Chippewa River Watershed Project Shoreline Lake Restorations. Provide cost-share and technical assistance to lakeshore owners for planting native grasses and forbs.</p> <p>3.J.2.a) Implement five (5) shoreline restoration projects.</p>	*CRWP, LRM, SWCD, COLA, DNR	\$10,000	\$1,000
<i>Objective J Average Annual Costs</i>			\$12,000	\$2,200
<i>Objective J 5-Year Overall Estimated Costs</i>			\$60,000	\$11,000

GOAL 4: TO PROTECT THE COUNTY'S AQUIFERS

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective K: Implement Best Management Practices in Wellhead Protection Areas.				
Countywide	<p>4.K.1. Wellhead Protection. Participate in the preparation and implementation of wellhead protection plans for public water suppliers.</p> <p>4.K.1.a) Target groundwater BMP Programs in Wellhead Protection Areas, such as RIM and CRP.</p> <p>4.K.1.b) Incorporate Wellhead Protection Areas into local zoning maps. Make the maps available online and update annually.</p> <p>4.K.1.c) Work with cities on mutually agreed upon ordinance language for Wellhead Protection Areas.</p> <p>4.K.1.d) Target sealing all abandoned wells in Wellhead Protection Area. Implement two (2) annually.</p>	*LRM, *SWCD, MDH, Cities	\$40,000	\$10,000
<i>Objective K Average Annual Costs</i>			\$8,000	\$2,000
<i>Objective K 5-Year Overall Estimated Costs</i>			\$40,000	\$10,000

GOAL 4: TO PROTECT THE COUNTY'S AQUIFERS

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective L: Ensure there is an adequate supply of safe drinking water.				
Countywide	<p>4.L.1. Groundwater BMP Program. Provide educational, technical and financial assistance, as available, to landowners for the implementation of groundwater protection BMPs.</p> <p>4.L.1.a) Secure funding includes technical assistance to install ag BMPs and nutrient management plans to protect groundwater. Prioritize sensitive groundwater recharge areas.</p> <p>4.L.1.b) Incorporate the County's sensitive groundwater recharge areas map into to the local land use decision making process.</p> <p>4.L.1.c) Implement two (2) groundwater BMP projects annually.</p> <p>4.L.1.d) Seal four (4) abandoned wells annually.</p>	*SWCD, MDH, MDA, UME	\$150,000	\$40,000
Countywide	<p>4.L.2. Groundwater Quality Monitoring. Assist with groundwater quality monitoring efforts and proactively enact measures to protect water supplies, when appropriate.</p> <p>4.L.2.a) Annually review data and prioritize BMP Programs accordingly.</p> <p>4.L.2.b) Continue to participate in the Bonanza Valley Groundwater Study.</p> <p>4.L.2.c) Continue to test drinking water for nitrates through the County's Public Health Department.</p> <p>4.L.3.d) Biannually promote and conduct Nitrate Testing Clinics.</p>	*SWCD, MDH, MPCA, PH, MDA	\$25,000	\$10,000
Countywide	<p>4.L.3. Pesticide Container Collection. Work with Pope/Douglas County Solid Waste to have an annual pesticide container collection day.</p>	*CB, PDSW, MDA	\$10,000	\$5,000

Objective L continued...

Objective L continued...

Chippewa River Watershed	4.L.4. Chippewa River Watershed Project Groundwater BMPs. Work with landowners to understand the importance of properly seal abandoned wells. 4.L.5.a) Cost-share sealing twenty-five abandoned wells.	*CRWP	\$12,500	\$500
<i>Objective L Average Annual Costs</i>			\$39,500	\$11,100
<i>Objective L 5-Year Overall Estimated Costs</i>			\$197,500	\$55,500

GOAL 4: TO PROTECT THE COUNTY'S AQUIFERS

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective M: Implement Best Management Practices to protect the quantity of groundwater.				
Countywide	<p>4.M.1. Groundwater Quantity Monitoring. Assist with groundwater quantity monitoring efforts and proactively enact measures to protect water supplies, when appropriate.</p> <p>4.M.1.a) Continue to monitor 20 groundwater well test sites annually.</p> <p>4.M.1.b) Review data annually and prioritize BMP Programs accordingly.</p>	*SWCD, DNR, MDA	\$50,000	\$10,000
Countywide	<p>4.M.2. Groundwater Quantity BMPs. Provide educational, technical and financial assistance, as available, to landowners for the implementation of groundwater protection BMPs.</p> <p>4.M.2.a) Cost-share converting conventional irrigation systems to conservation systems. Implement two (2) projects annually.</p> <p>4.M.2.b) Increase acres in Irrigation Management Program by 5,000 acres.</p> <p>4.M.2.c) Annually participate in the MDA's Irrigation Workshops.</p> <p>4.M.2.d) Biannually host a local workshop/demonstration site.</p>	*SWCD, MDA, UME	\$75,000	\$5,000
Countywide	<p>4.M.3 County Geologic Atlas. Host a workshop every three years with the DNR and Minnesota Geological Survey on how best to incorporate the County's Geologic Atlas into the land use decision making process (2013, 2018).</p>	*LRM, SWCD, DNR, MGS	\$6,000	\$2,500
Countywide	<p>4.M.4 County Water Conservation Plan. Pursue funding to establish a Water Conservation/Drought Contingency Plan (2015).</p> <p>4.M.4.a) Partner with stakeholders to provide household water conservation kits, including low-flow showerheads and low-flow toilet conversion kits.</p>	*SWCD, LRM, DNR, MDA	\$50,000	\$12,500
Objective M Average Annual Costs			\$36,200	\$6,000
Objective M 5-Year Overall Estimated Costs			\$181,000	\$30,000

GOAL 5: TO EFFECTIVELY ADMINISTER THE WATER PLAN

Priority Watershed	Action Step	Stakeholders *Local Lead	5-Year Estimated Costs	
			Overall	Local
Objective N: Engage the Citizens and Stakeholders on key water planning issues and implementation opportunities.				
Countywide	<p>5.N.1. Ongoing Issues and Programs. Properly raise awareness on key water planning issues and available BMP funding opportunities.</p> <p>5.N.1.a) Quarterly publish newsletters.</p> <p>5.N.1.b) Promote BMP programs in the newspaper a minimum of two times annually.</p> <p>5.N.1.c) Quarterly update websites with current information.</p> <p>5.N.1.d) Establish BMP demonstration/test sites.</p> <p>5.N.1.e) Annually host workshops on priority water planning issues.</p> <p>5.N.1.f) Annually promote BMP practices and available funding at the Pope County Fair.</p>	*SWCD	\$50,000	\$25,000
Countywide	<p>5.N.2. Water Plan Funding. Secure funding and stakeholder cooperation to properly implement the Water Plan’s Action Steps.</p> <p>5.N.2.a) Annually apply for Clean Water Funds and similar funding mechanisms to implement Action Steps.</p> <p>5.N.2.b) Ensure the County is prepared to provide matching funds in order to qualify for BMP grants.</p>	*SWCD, CB	\$20,000	\$20,000
Countywide	<p>5.N.3 Watershed Focus and Stakeholder Cooperation. Partner with watershed/stakeholder groups on implementation activities to minimize expenditures and to maximize results.</p> <p>5.N.3.a) Annually attend watershed/stakeholder meetings.</p> <p>5.N.3.b) Invite watersheds/stakeholders to participate with local water plan initiatives.</p> <p>5.N.3.c) Examine establishing a committee of LGU’s and stakeholders (i.e., COLA, lake associations, etc.) to create a process of establishing ownership of water improvement projects in the County.</p>	*SWCD, CRWP, SRWD, NFCRWD, COLA, All	\$10,000	\$10,000

Objective N continued...

Objective N continued...

Countywide	<p>5.N.4 Water Plan Task Force. Keep the local Water Plan Task Force engaged in ongoing water plan activities.</p> <p>5.N.4.a) Annually meet with the Task Force to review progress and to discuss current programs, upcoming projects and water plan activities.</p> <p>5.N.5.b) Update the Water Plan’s Action Steps before the Plan expires in 2018.</p>	*SWCD, WPTF	\$5,000	\$5,000
<i>Objective M Average Annual Costs</i>			\$17,000	\$12,000
<i>Objective M 5-Year Overall Estimated Costs</i>			\$85,000	\$60,000

Chapter Four: Water Plan Administration

Chapter Four contains information regarding the administration of the Water Plan, including plan coordination, implementation process and timeline, role of the County and other agencies in implementation, recommended changes to State programs, intergovernmental conflicts/resolution process, major and minor plan amendment procedures, and general information.

A. Plan Coordination

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

Throughout the Water Plan, County departments, local government units, special interest groups, and State and Federal agencies are listed pertaining to specific water planning topics. In addition, each Action Step found in Chapter Three under the County's Water Plan Goals and Objectives, identifies the potential stakeholders involved with implementing each Action Step listed. It is hoped that the valuable cooperation that has been established in the past years will continue and be enhanced through properly implementing this Water Plan.

Pope County will ensure coordination and implementation of its Comprehensive Local Water Plan through its established Water Plan Task Force. The Task Force will meet regularly to review progress, identify emerging problems, discuss opportunities, and to continue to direct the implementation of the Plan. The Task Force will be supported by the County Board appointed Water Plan Coordinator, which is currently housed in the Pope County Soil and Water Conservation District (SWCD). The Coordinator will administer the Action Step portion of the Plan, coordinate the Task Force activities, assist with writing grant proposals, prepare annual work plans and reports, and other activities as needed. The Land and Resource Management Department and the County's Feedlot Officer will also assist with implementation activities.

B. Implementation Plan and Priorities

Coordination of Water Plan activities will commence with the County Board adoption of the Plan. These activities will be conducted throughout the planning period identified as 2013 – 2023. Chapter Three of the Water Plan shall serve as the County's official Implementation Plan, and shall cover the first five years of the Plan (2013-2018). In 2018, Chapter Three will need to be updated to cover the years 2018-2023.

The SWCD annually prepares a Work Plan that is reviewed and approved by the Pope County SWCD Board of Supervisors. Due to the Water Plan Coordinator position being housed within the SWCD, this Annual Work Plan shall also serve as the County's official set of water planning priorities and list of potential projects on a yearly basis. Many of the Action Steps identified in Chapter Three represent commitments on behalf of Pope County that will take place on an ongoing basis. For example, administering the State's Feedlot and SSTS regulations translates into being responsible for a variety of ongoing responsibilities. Conversely, many of the Action Steps identified in Chapter Three represent specific projects that would be implemented within a single year or over a few years.

Table 4A lists these specific projects and ranks them in order of implementation priority (i.e., high, medium, low). Please note that, although specific years are listed for target completion dates, many of the Action Steps will need to rely on grant and/or stakeholder funding in order to be accomplished. Furthermore, it is expected that Table 4A will be revised and updated accordingly as part of the SWCD's Annual Work Plan. This will help to ensure the County's current water planning priorities and list of potential projects are updated on a regular basis. The intent to meet at least annually to review water planning issues and to identify an annual set of priorities was communicated by the Pope County Board of Commissioners during the Water Plan's Public Hearing, which took place on April 2, 2013 (see Appendix C). *Table 4A also does not represent all stakeholders' implementation prioritizes, but simply Pope County's priorities.*

Overall, Pope County's main water planning priority is to protect and enhance surface water quality. This will be pursued by implementing the Objectives and Action Steps identified in Chapter Three under Goal One: To Ensure that Pope County's Surface Water Resources Exceed Minimum Water Quality Standards.

After surface water quality, the County's next ranked priority water planning issue surrounds addressing soil erosion and sedimentation issues. These issues are also directly connected to water quality concerns; however, they also happen to be the main focus of the County's SWCD. Groundwater quality and quantity issues rank next, primarily due to the connection between having access to good groundwater, and people's health and economic development capacity. Finally, the fourth ranked priority water planning issue addresses properly managing surface water quantity issues, including ag drainage, stormwater management, and water storage.

In summary, Pope County's priority water planning issues rank in the following order:

- 1. Surface Water Quality Issues and Action Steps**
- 2. Soil Erosion and Sedimentation Control Issues and Action Steps**
- 3. Groundwater Quality/Quantity Issues and Action Steps**
- 4. Surface Water Quantity/Management Issues and Action Steps**

**Table 4A:
Pope County Water Plan Project Implementation Priorities**

Priority	Action Step Number and Brief Description (refer to Chapter Three for more details)	Implementation Year Target
<i>Medium</i>	1.A.2.a) Seek opportunities to refine watershed analysis and management strategies using detailed GIS information, water quality data and other tools to guide plan actions, target implementation and augment funding from outside sources.	2015
<i>Medium</i>	1.A.3. Alternative Shoreland Management Ordinance. Adopt the Alternative Shoreland Management standards that are currently being discussed statewide once they become available.	2014
<i>High</i>	1.A.4.a) Complete a full inventory of the ravines along the south shore of Lake Minnewaska. With landowner permission, evaluate their condition and prioritize for potential projects.	2013
	1.A.4.b) Survey and develop preliminary plans to repair and enhance the ravines. Pursue Clean Water Funding to implement priority projects. Target and implement twenty (20) water quality BMPs.	2014
<i>High</i>	1.B.1. Ann Lake TMDL. Reduce annual total phosphorus levels by 5,000 pounds.	2018
	1.B.1.a) Establish one (1) vegetative shoreland buffer in a critical area.	2014
	1.B.1.b) Cooperatively work with stakeholders to restore two (2) wetlands.	2014, 2017
	1.B.1.c) Install two (2) ag waste BMPs in the Ann Lake subwatershed.	2013, 2016
<i>High</i>	1.B.2. Lake Emily TMDL. Reduce annual total phosphorus levels by 2,000 pounds.	2018
	1.B.2.a) The lakeshed shall be considered high-priority for shoreland and stream restorations. Implement two (2) projects.	2014, 2017
	1.B.2.b) Continue to examine the costs-benefits of restoring a portion of the Little Chippewa River.	2013
	1.B.2.d) Install five (5) sediment basins.	2017
<i>High</i>	1.B.3. Gilchrist Lake TMDL. Reduce annual total phosphorus levels by 1,500 pounds.	2018
	1.B.3.a) Evaluate the Mill Pond along the East Branch of the Chippewa River to determine its role in water quality.	2014
	1.B.3.c) Implement two (2) shoreline restoration projects.	2014, 2017
	1.B.3.d) Implement \$300,000 in EQiP funds for Ag BMPs.	2013
<i>Medium</i>	1.B.4. Lake Leven TMDL. Reduce annual total phosphorus levels by 500 pounds.	2018
	1.B.4.a) Evaluate JD4 for water quality and ag BMP needs.	2015
	1.B.4.b) Implement two (2) water quality and/or ag BMP projects.	2016, 2017
	1.B.4.c) Investigate JD4 lateral locations and BMPs.	2015
<i>Medium</i>	1.B.5. Malmedal TMDL. Reduce annual total phosphorus levels by 500 pounds.	2018
	1.B.5.b) Cost-share installing twenty (20) alternative tile intakes.	2018

Table 4A continued...

Table 4A continued...

Priority	Action Step Number and Brief Description (refer to Chapter Three for more details)	Implementation Year Target
High	1.B.6. Pelican Lake TMDL. Reduce annual total phosphorus levels by 500 pounds.	2018
	1.B.6.a) Target Trapper’s Run subwatershed for implementing two (2) water quality BMPs.	2014, 2016
	1.B.6.b) Implement two (2) shoreland restoration projects.	2014, 2017
	1.B.6.c) Redesign and improve the Trapper’s Run fish barrier sed basin.	2017
High	1.B.7. Lake Reno TMDL. Reduce annual total phosphorus levels by 350 pounds.	2018
	1.B.7.a) Establish 2,000 feet of shoreline vegetative buffers.	2015
	1.B.7.b) Implement two (2) shoreland restoration projects.	2015, 2017
	1.B.7.c) Secure funding for SSTS inspections to identify imminent health threats.	2014
High	1.B.10 Ashley Creek. Prioritize implementing BMPs until Ashley Creek is delisted from MPCA’s 303d List of Impaired Waters for E.coli and Aquatic Bioassessments.	2018
	1.B.10.b) Cost-share incentives to establish 100 acres of vegetative buffer strips.	2015
	1.B.10.c) Implement two (2) bank stabilization projects.	2014, 2016
	1.B.10.d) Work with producers to update/create two (2) manure management plans.	2015
High	1.B.11 Westport Lake. Prioritize implementing BMPs until Westport Lake is delisted from MPCA’s 303d List of Impaired Waters for excessive nutrients.	2018
	1.B.11.b) Implement two (2) water quality shoreline BMPs.	2015, 2017
	1.B.11.c) Work with producers to update/create one (1) manure management plan.	2016
High	1.B.12 County Ditch 6. Prioritize implementing BMPs until County Ditch 6 (a tributary to Ashley Creek) is delisted from MPCA’s 303d List of Impaired Waters for excessive nutrients.	2018
	1.B.12.a) Cost-share incentives to establish 100 acres of vegetative buffer strips.	2017
	1.B.12.b) Work with producers to update/create two (2) manure management plans.	2015, 2017
High	1.B.13 SSTS Inspections. Inspect SSTS for imminent health threats.	2014
High	1.D.2. Noncompliant Upgrades. Secure financial assistance programs to provide assistance for homeowners to upgrade noncompliant SSTSs.	2014
High	1.E.3. AIS Task Force. Create a local AIS Task Force.	2013
High	2.F.6. Hoff Township Project. Secure funding to properly implement a grade stabilization project in Hoff Township less than one mile from the Chippewa River. Project includes side inlets, re-sloping ditch, and establishing buffers.	2014

Table 4A continued...

Table 4A continued...

Priority	Action Step Number and Brief Description (refer to Chapter Three for more details)	Implementation Year Target
Medium	3.G.2.b) Pursue funding to establish a two-stage ditch system test site.	2017
High	3.H.1.a) Apply for funds to develop a Stormwater Management Plan for the City of Starbuck.	2014
High	3.H.1.b) Partner with the City of Glenwood on implementing its Stormwater Management Plan.	2013-14
Medium	3.H.3 Floodplain Maps. Work with FEMA to convince them to create a new Floodplain Map for Pope County.	2016
High	4.M.2.b) Increase acres in Irrigation Management Program by 5,000 acres.	2018
Low	4.M.4 County Water Conservation Plan. Pursue funding to establish a Water Conservation/Drought Contingency Plan.	2015

C. Types and Sources of Water Plan Funds

Pope 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 Action Steps are a reflection of the water resource concerns in the County. Implementation will be based on current needs, funding, and availability of staff.

The annual work plan will provide basic information on the actions intended to be implemented. The County realizes that completion of all Goals and Objectives requires staff and funds beyond the County's budget. It is also understood that State funding cannot provide the funding for all Goals and Objectives, therefore total stakeholder cooperation will be required. The County, through various sources, will pursue outside funding opportunities as they become available. To properly fund the implementation of the Water Plan and related activities, Pope County will rely on a combination of the following types and sources of funding:

- **Natural Resource Block Grant Funds**, including but not limited to:
 - ❖ **MPCA Feedlot Permit Program** - This program was created to protect water quality by improving animal waste treatment systems on feedlots. A county feedlot program is established by transferring of regulatory authority from the Minnesota Pollution Control Agency to the county. This transfer of authority is granted by statute and it allows the Minnesota Pollution Control Agency to "delegate" administration of certain parts of the feedlot program to counties. County feedlot programs have the responsibility for implementing state feedlot regulations including: registration; permitting; inspection; education and assistance; and compliance follow-up.

- ❖ **Local Water Management Program** - The Comprehensive Local Water Management Program is a voluntary program that requires counties to use local task forces to develop and implement water plans based on local priorities.
 - ❖ **DNR Shoreland Management Program** - the State Shoreland Management Program was established to promote the wise development of shorelands in order to preserve and enhance the quality of surface waters, preserve the economic values of shorelands, and ensure the wise use of water and related resources.
 - ❖ **MPCA Subsurface Sewage Treatment Systems (SSTS)** - Based on 1997 changes to Minnesota Statutes, all counties are required to pass ordinances regulating Individual Sewage Treatment Systems countywide. In return, Pope County receives money annually to implement the SSTS Program.
 - ❖ **Wetland Conservation Act (WCA) Implementation** - The purpose of the Wetland Conservation Act (WCA) is to maintain and protect Minnesota's wetlands and the benefits they provide. The Board of Water and Soil Resources requires that under this grant program, a county must transfer a minimum of \$5,000 to the SWCD for WCA activities or a greater amount as agreed upon by the County and SWCD.
- **State, Local, and Federal Grants** – numerous grant funds and programs are made available to implement local water plan or related initiatives, including but not limited to Minnesota’s Clean Water Fund.
 - **Local Governmental Unit (LGU) Funds/In-Kind** – Some water planning initiatives will require funds spent by the various LGUs involved. This will include cities, townships, and watershed districts, along with Pope County. Numerous grant programs count the time spent by LGU representatives as an In-Kind expense.
 - **Pope County Staff** – Pope County will continue to maintain a trained staff to properly implement the various Water Plan initiatives. This expense is normally considered as a cash contribution towards implementing various State and Federal Grant Programs.
 - **Landowner Expenses** – Although many Water Plan Action Steps can be completed at no cost to landowners, some projects may require landowners to contribute a portion of the overall costs.
 - **Stakeholder Participation** – The various stakeholders involved with implementing the Water Plan will also contribute funds and staffing, as available.

D. Recommended State Cooperation

In order to implement the goals and objectives set forth in the Pope County 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 recommendations:

1. Counties should continue to be notified of State agency program changes and the availability of funding; and
2. Data collected by State agencies should be readily shared with the County and other water plan stakeholders to avoid duplicative efforts; and
3. State agencies should continue to provide local and/or regional staff to assist local officials with agency programs; and
4. Fees collected at the County level should be allowed to remain within the County to administer and implement water-related programs; and
5. 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
6. 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.

E. Intergovernmental Conflicts/Resolution Process

In the development of this Plan, there were no intergovernmental conflicts that arose. In the event that an intergovernmental conflict over the Water Plan does occur, the Pope County Board of Commissioners shall request the Pope County Water Plan Task Force to attempt to negotiate resolution of the conflict. If the Task Force does not resolve the conflict, the County shall petition the Board of Water and Soil Resources (BWSR) for a contested case hearing.

F. Water Plan Amendment Procedure

The Pope County Comprehensive Local Water Plan is intended to extend through the year 2023. If the County need to revise the Plan for any reason prior to a new Plan being developed, the County will need to follow Minnesota Statute 103B.314, Subdivision 6. In summary, copies of the proposed amendments (along with the date of the public hearing) need to be sent to BWSR, and local governmental units, and the State agencies for review. After the public hearing, BWSR must approve the amendments and copies shall be sent to the various stakeholders identified by State Statute.

G. Water Plan Key Stakeholders

The success of the County’s Water Plan depends upon the collaborative efforts of multiple water plan stakeholders. To highlight the significance of this, the Pope County Water Plan Task Force created a separate objective in Chapter Three to “**Engage the Citizens and Stakeholders on key water planning issues and implementation opportunities.**” This section briefly outlines some of Pope County’s key Water Plan Stakeholders, including a link to the stakeholder’s current website.

Pope County Soil & Water Conservation District (SWCD)

Pope SWCD is a local unit of government established under state law to carry out conservation programs at the local level. The SWCD works with Pope County landowners to help them manage and protect land and water resources on all private land and also assist with a variety of natural resource concerns. The Mission of the Pope Soil & Water Conservation District is “To promote, guide, and provide high quality technical assistance for Pope County and for the enhancement and protection of land and water resources through implementation projects that will lead toward effective conservation of soil and water.”

Currently, the Pope SWCD is responsible for administering the County’s Water Plan (traditionally that has been the responsibility of the Pope County Land and Resource Management Department). The SWCD office is co-located with the *USDA Natural Resource Conservation Service (NRCS)*. For more information on the Pope County SWCD, visit the following website:

<http://www.popeswcd.org/>

Pope County Land and Resource Management

The Pope County Land and Resource Management is charged with providing residents with assistance involving Planning and Zoning, Community Development, Solid Waste Management and Water Planning activities.

Planning and Zoning responsibilities include:

- Issuance of land use permits and enforcement of the zoning ordinance.
- Feedlot regulation compliance.
- Septic system inspections and permitting.
- Comprehensive or long-range planning.

Solid Waste Management duties involve various partnerships to provide the following services:

- Recycling (independent vendors.)
- Incineration/land filling (Pope/Douglas Solid Waste Management.)
- Household and Hazardous waste (Pope/Douglas Solid Waste Management.)
- Agricultural chemical and container collections (Minnesota Department of Agriculture.)

Community Development incorporates the following:

- Community organizing to establish public policy.
- Grant writing for various projects.
- Strategic community planning.
- Health and safety issues for County employees.

Water Planning activities include:

- Lake and stream monitoring.
- Land use improvements with some cost share opportunities.
- Lakescaping projects.
- Storm water and flood retention programming.
- Environmental planning and public education.
- Grant writing to implement Water Plan initiatives.

For more information on Pope County's Land and Resource Management Office, please visit the following website:

http://www.co.pope.mn.us/land_resource_management.php

Pope County Public Health

The Pope County Public Health operates as an individual county public health agency and through a joint powers agreement as a member of Mid-State Community Health Services (Grant, Pope, Stevens and Traverse Counties). Public Health get involved with a number of water planning issues, especially related to drinking water quality and water-borne types of health issues. For more information on the Pope County Public Health, please visit the following website:

http://www.co.pope.mn.us/public_health.php

Pope Douglas Solid Waste Management

Pope / Douglas Solid Waste Management is a partnership created by Pope and Douglas Counties in 1983. The partnership was created to manage the solid waste stream generated in both counties. They are involved with a number of water planning issues, including assisting with pesticide container drop off days and selling various types of rain barrels. In addition, they now also collect household pharmaceuticals for proper disposal to help keep them off the streets, out of landfills, and out of groundwater. For more information, please visit the following website:

<http://www.popedouglasrecycle.com/>

Pope County Highway Department

The Highway Department is responsible for maintenance & construction on all county streets & highways. The Department is responsible for 370 miles of roadways and 64 bridges, and numerous projects involve water plan issues. Some specific duties within the Department include the following:

- Planning, designing, constructing and inspecting all road and bridge projects.
- Preparation of a 5-year plan outlining proposed road and bridge projects.
- Acquisition of necessary easements and Right of Way.
- Administration of construction contracts and maintenance projects with an annual County State Aid allotment of \$2,840,000.
- Annual safety Inspections of all bridges including township and city bridges.
- Providing County road maintenance, including ice and snow removal, on 240 miles of bituminous roads and 130 miles of gravel roads.
- New is the annual application of calcium chloride for dust control on gravel roads.
- Mowing and maintenance of county road ditches.
- Assist Townships & Cities with design & maintenance projects.

<http://www.co.pope.mn.us/highway.php>

Natural Resource Conservation Service (NRCS)

The Natural Resources Conservation Service (NRCS) draws on a long history of helping people help the land. For more than 75 years, NRCS and its predecessor agencies have worked in close

partnerships with farmers and ranchers, local and state governments, and other federal agencies to maintain healthy and productive working landscapes. The main connection to the Water Plan is the NRCS administers many of the Farm Bill's conservation initiatives. The Pope County NRCS is co-located with the Pope County SWCD. For more information, visit the following website:

<http://www.mn.nrcs.usda.gov/>

Pope County Coalition of Lakes (COLA)

The Pope County COLA is organized to facilitate cooperation among its member lake associations and to assist in fostering wise and legal use of lake areas. It recognizes the following goals:

- To identify and analyze environmental impact problems in the lake areas.
- To develop guidelines relative to the proper development, improvement and preservation of the lakes, their shorelands and watersheds.
- To present such guidelines and COLA positions to agencies of government, business and private individuals in order to bring appropriate action for the effective use of these valuable natural resources.
- To disseminate information relative to the above goals to the members and the general public.

For more information, please visit the following website:

<http://www.minnesotawaters.org/group/pccola/welcome>

Chippewa River Watershed Project

The Chippewa River Watershed Project (CRWP) is a non-regulatory, cooperative partnership and citizen based approach focused on improving water quality and watershed life in the Chippewa River and its tributaries. Portions of eight counties make-up the Chippewa River Watershed including: Otter Tail, Grant, Stevens, Douglas, Pope, Swift, Chippewa, and Kandiyohi. The CRWP is currently funded with state Clean Water Partnership Grants, Federal 319 Grant Dollars, and local water plan contributions. The CRWP also relies heavily on the volunteerism and commitment of our partners. For more information, visit the following website:

<http://www.chippewariver.com/default.aspx>

North Fork Crow River Watershed District

The North Fork Crow River Watershed District (NFCRWD) was formed on May 10, 1985, and encompasses a small portion of northeastern Pope County. NFCRWD was awarded a 2012 Board of Water and Soil Resources conservation drainage grant for Agricultural Best Management Practices (BMPs). The NFCRWD will be implementing best management practices (Rock Inlets, Controlled Outlets and Woodchip Bioreactors) on existing tile systems that outlet to country ditches. For more information on NFCRWD, visit their following website:

<http://nfcrawd.org/>

Sauk River Watershed District

It is the vision of the Sauk River Watershed District (SRWD) to protect and enhance our natural resources by increasing public awareness and involvement. The District board and staff works to expand projects and programs through technical assistance to identify impaired waters and establish TMDL's. The District pursues financial assistance for the general public to implement Best Management Practices (BMP's) and to provide support to project partners technically and financially. For more information, visit the following website:

<http://www.srwdmn.org/>

State Agencies

Many of Minnesota's State Agencies are involved with some form of environmental protection efforts, especially when it pertains to protecting Minnesota's water resources. A brief synopsis of their major water planning efforts are summarized below.

Board on Water and Soil Resources (BWSR) - The Minnesota Board of Water and Soil Resources (BWSR) was created in 1987, when the Legislature combined the Soil and Water Conservation Board with two other organizations with local government and natural resource ties: the Water Resources Board and the Southern Minnesota Rivers Basin Council. Upon inception, its membership included 17 members: representing soil and water conservation districts; watershed management organizations, counties, citizen members, agency members (University of Minnesota Extension Service, the Minnesota Department of Natural Resources, the Minnesota Department of Agriculture, the Minnesota Department of Health, and the Minnesota Pollution Control Agency). BWSR provides oversight of local Water Management Plans. For more information, visit BWSR's website:

<http://www.bwsr.state.mn.us>

Minnesota Department of Natural Resources (DNR) – The Department of Natural Resources (DNR) is a key water plan stakeholder in many ways. They assist with monitoring ground and surface water quantity, they are the permitting agency for water appropriations, and they are the main agency working with preventing the spread of Aquatic Invasive Species. In addition, they work with a variety of stakeholders, including the general public, on providing a vast amount of water resource education. For more information, visit the DNR website:

<http://www.dnr.state.mn.us/water/index.html>

Minnesota Pollution Control Agency (MPCA) - The Minnesota Pollution Control Agency (MPCA) helps protect our water by monitoring its quality, setting standards and controlling what may go into it. They assist with water surface and groundwater quality protection programs including ground water monitoring, stormwater management, municipal wastewater permitting, identifying Impaired Waters, solid and hazardous waste management, Subsurface Soil Treatment System (SSTS) management, and animal feedlot registration and enforcement. They also provide a vast amount of technical and educational assistance on Best Management Practices (BMPs) related to water quality protection and land use practices. For more information, visit MPCA's website:

<http://www.pca.state.mn.us/index.php/water/index.html>

Minnesota Department of Health (MDH) – The Minnesota Department of Health (MDH) is the primary State agency involved with monitoring and protecting ground and drinking water supplies. They have a vast amount of ground water quality data, and take the lead in developing Wellhead Protection Plans for public water suppliers. They also provide information on the importance of sealing abandoned wells and testing household wells for a variety of contaminants. For more information on MDH's activities, visit MDH's website:

<http://www.health.state.mn.us/macros/topics/environment.html>

Minnesota Department of Agriculture (MDA) – As a leading agricultural state with more surface waters than any other of the 48 contiguous states, and an abundance of clean drinking water, Minnesota is committed to helping farmers, homeowners, and industry protect these water resources. The MDA is responsible for or involved in many water quality programs and initiatives. These include, but are not limited to, the following:

- Agricultural Best Management Practices Loan Program. A low interest loan program administered by the MDA that helps finance water quality practices.
- Minnesota Clean Water Legacy Act. The MDA currently oversees several research projects aimed at making cleanup efforts more effective.
- Comprehensive Groundwater Protection Act of 1989. The MDA regulates most matters relating to pesticides and fertilizers.

The MDA has also developed the following website to assist with County Water Plans:

<http://www.mda.state.mn.us/en/protecting/waterprotection/waterplanning.aspx>