

Fillmore County



2006-2015

Fillmore County
Comprehensive Local Water Management Plan
2006-2015

Fillmore County Board of Commissioners

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Table of Contents

Cover page	Page 1
Table of Contents	Page 2
Executive Summary	
<i>Introduction</i>	Page 3
<i>Purpose of the Local Water Management Plan</i>	Page 5
<i>Description of Priority Concerns, Summary of Goals/Actions, Projected Costs</i>	Page 6
<i>Consistency of Plan with Other Pertinent Local, State, and Federal Plans</i>	Page 9
Priority Concerns	
<i>Assessment of Priority Concerns</i>	Page 10
<i>Objectives and Actions</i>	Page 25
Implementation Schedule for Priority Concerns	Page 32
Implementation Schedule for Ongoing Activities	Page 36
Appendix	
<i>Priority Concerns Scoping Document</i>	Page 40
<i>South Branch Root River Tillage Transect Survey Results, 2005</i>	Page 50
<i>Depth to Bedrock Map</i>	Page 51
<i>Pollution Sensitivity of the St. Peter-Prairie du Chien-Jordan Aquifer</i>	Page 52
<i>Sinkhole Probability Map</i>	Page 53
<i>Springshed Map</i>	Page 54
<i>Decorah Shale Map</i>	Page 55
<i>2004 Pesticide Monitoring Results - Atrazine</i>	Page 56
- Acetochlor	Page 57
- Metolachlor	Page 58

Executive Summary

Introduction

Fillmore County is located in southeastern Minnesota in the southernmost tier of counties along the Iowa border. Only Houston County to the east lies between Fillmore County and the Mississippi River. Mower County borders Fillmore County to the west, and Olmsted and Winona counties lie along its northern border.

The landscape of Fillmore County is characterized by karst. Karst describes a three-dimensional hydrologic system created by the solution of carbonate bedrock resulting in conduits which facilitate rapid movement of water through the subsurface. Shallow soil cover over much of the county and the prevalence of karst features create an area highly sensitive to ground water contamination from pollution sources at or near the land's surface. Karst features include sinkholes, springs, caves, disappearing streams, and blind valleys. These features provide many interconnections between surface water and ground water.



Oneota dolomite road cut near Chatfield

Fillmore County's first Comprehensive Local Water Management Plan was approved by the MN Board of Water and Soil Resources (BWSR) on March 28, 1990, and adopted by the Fillmore County Board of Commissioners on December 11, 1990, following about two years of development by a committee of local residents and county and state agency staff. In January, 1991, the county hired a halftime Water Plan Coordinator to coordinate implementation of the plan. In 1995, the water plan underwent a five-year revision and update which was approved by the BWSR on January 24, 1996. A second update was completed in 2000 which was approved by the BWSR on December 13, 2000. This update of the water plan will be effective for ten years from January, 2006 to December, 2015. The plan will be reviewed and amended as needed in 2010.

In 2001, the Fillmore Soil and Water Conservation District (SWCD) Board of Supervisors adopted the Local Water Management Plan as the SWCD's Comprehensive Plan. This broadens the scope of the SWCD's mission and reduces the duplication of developing two plans that essentially addressed many of the same land and water resource concerns.

The Fillmore County Water Planning Committee is responsible for the update of the Comprehensive Local Water Plan. The Fillmore County Board of Commissioners has appointed the following citizens to three-year terms on the Water Planning Citizens' Advisory Committee to make policy recommendations for a plan to manage the county's water resources:

Debby Anderson, Chatfield	(District 1)
Roger Ekern, Rushford	(District 2)
Vacant	(District 3)
Pat Troendle, Lanesboro	(District 4)
Nancy Overcott, Canton	(District 5)

The Fillmore Soil and Water Conservation District (SWCD) Board of Supervisors representative is Margaret Ness. County Board representatives are Duane Bakke and Stafford Hansen.

The Water Planning Technical Committee consists of county and state agency staff who have more direct involvement with the implementation of the water plan. Technical Committee members are:

Sandra Benson	Fillmore County Recycling Education Coordinator
Norman Craig	Fillmore County Zoning Administrator
Mike Frauenkron	Fillmore County Feedlot Officer
Lee Ganske	MN Pollution Control Agency (MPCA)
Sue Glende	USDA Natural Resources Conservation Service (NRCS) District Conservationist
Jeff Green	MN Department of Natural Resources (DNR) Regional Groundwater Specialist
Bea Hoffmann	SE MN Water Resources Board (WRB) Executive Director
Mary Kells	MN Board of Water and Soil Resources (BWSR) Board Conservationist
John Kelly	MN DNR District Forester
Don Krohn	Fillmore SWCD Administrator
Tammy Martin	USDA Farm Service Agency (FSA) County Executive Director
Brenda Pohlman	Fillmore County Public Health
Jerry Tesmer	University of Minnesota Extension Service, Fillmore County

Implementation of the water plan and the update and revision of the plan are coordinated by Donna Rasmussen, Fillmore County Water Plan Coordinator.

Other cooperating agencies are the Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH), Minnesota Geological Survey (MGS), and the University of Minnesota.

Fillmore County is a member of the Southeast Minnesota Water Resources Board (formerly the Zumbro/Root River Joint Powers Board) with nine other counties. Two county commissioners serve on the Board, which meets every other month. The mission of the Board is to “help sustain the quality of life in the ten counties of southeastern Minnesota by improving and protecting the water resources through the coordination of local water planning efforts.” Priorities for regional projects are based on water quality issues that are common to the karst region and to the watersheds in the region and are identified as priorities in each county’s water management plan. The SE MN Water Resources Board website is <http://csweb.winona.edu/semnwrp>.

Fillmore County is an active participant in the Basin Alliance for the Lower Mississippi in Minnesota (BALMM). BALMM is a locally led coalition of land and water resource agencies formed to coordinate efforts to protect and improve water quality in the basin. Projects initiated in the last five years through BALMM are aimed at reducing fecal coliform bacteria in surface water (which also benefits ground water) and increasing permanent vegetative cover on the landscape to reduce soil erosion and runoff. For more information about BALMM, go to www.pca.state.mn.us/water/basins/lowermis/balmm.pdf.

Purpose of the Local Water Management Plan

The purpose of the local water management plan is the protection of water resources in the county from point and nonpoint sources of pollution. Coordination of these protection efforts between the various local, state, and local agencies and organizations reduces duplication and eliminates gaps in implementation strategies aimed at a common goal of water protection. The Water Plan Committee will continue to meet regularly to guide implementation programs and projects with the Citizens' Advisory Committee acting as liaison to the community at large to assure a broader perspective of water issues.

The water plan meets the requirements set forth in M.S. 103B.311subd.4 as follows:

1. The plan covers the entire county.
2. The plan addresses problems in the context of watershed units and ground water systems.
3. The plan is based upon principles of sound hydrologic management of water, effective environmental protection, and efficient management.
4. The plan is consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or ground water system.
5. The plan duration is for ten years with review and amendment to the plan as necessary in five years.

Description of Priority Concerns, Summary of Goals and Actions, and Projected Costs

The goals of the Fillmore County Local Water Management Plan are water quality goals that align with those in other local, regional, state, and federal plans to meet water quality standards for both surface water and ground water, including TMDLs (Total Daily Maximum Loads). (More information about TMDLs can be found at www.pca.state.mn.us/water/tmdl/index.html.) Actions within each priority concern are aimed at achieving the water quality goals taking into account the availability of funding and other resources that can be reasonably expected over the next ten years.

Water quality goals:

- ◆ Reduce fecal coliform bacteria levels in streams by 65% and in ground water to meet the drinking water standard.
- ◆ Reduce turbidity in surface waters to meet the water quality standard equivalent to 25 cm of transparency.
- ◆ Reduce nitrate concentrations to less than 10 mg/liter in ground water and in streams.
- ◆ Reduce concentrations of pesticides in streams and ground water to meet water quality standards.

1. Soil erosion and runoff were ranked as the highest priority based on all ranking processes used in developing the priority concerns. The visible effects of erosion and runoff, i.e. rills and gullies in fields and construction sites, turbid streams and rivers, silt-covered stream beds, and even muddy well water, have raised awareness of this problem among all segments of the county's population. Concerns are not limited to erosion on agricultural lands, although 80% of the land in Fillmore County is in farmland, and 77% of the farmland is cropland, according to the USDA National Agricultural Statistics Service. Increased development in both rural and urban areas emphasizes the need for erosion control whenever the natural land cover is disturbed. Runoff into sinkholes and contaminants transported in losing and disappearing streams compound these concerns because of the potential impacts to ground water and springs. Efforts to increase the number of acres in permanent vegetation are encouraged by programs such as the Conservation Reserve Enhancement Program (CREP) and the Conservation Security Program (CSP) which bring in federal funds that help achieve water plan goals. Other incentives for innovative practices that increase water infiltration and reduce runoff will be pursued as opportunities arise. Watershed-based efforts with other agencies and organizations are most effective in addressing water quality concerns identified through the TMDL process or other monitoring of individual streams.

Projected Cost over 10 years: \$181,000 in-kind + \$940,000 = \$1,121,000

2. Drinking water quality is a priority due to the susceptibility of ground water in the county to pollution. Well water test results from the county over the past 25 years show elevated nitrate levels and/or coliform bacteria present in a significant percentage of the samples. Both have serious health implications plus indicate the potential for the presence of other harmful contaminants. A key first step in addressing these issues is to test the water for contamination so those consuming it are aware of any problems. Once a problem is identified, steps can be taken to remediate the pollution sources or to find an alternative water supply. Pollution prevention measures will be encouraged. Financial assistance for

well sealing and replacement is also needed to assure safer drinking water for county residents.

About 53% of the county's population is served by community public water supplies. These public water suppliers are developing Wellhead Protection Plans that identify the land area in the contribution area of the well and the best management practices (BMPs) needed to reduce the risk of pollution entering ground water in those areas.

Projected Cost over 10 years: \$64,000 in-kind + \$520,000 = \$584,000

3. Inadequately treated human sewage is a source of fecal coliform bacteria and excess nutrients in streams and ground water. All but two of the 14 cities in the county have municipal wastewater treatment facilities that are regulated by the MN Pollution Control Agency. The county is delegated enforcement of Chapter 7080 rules for individual sewage treatment systems (ISTS). Only about one-third of the ISTS in the county have been issued an ISTS permit since 1995. The remaining two-thirds pose a potential water pollution risk over the next ten years. Fillmore County's ISTS Pilot Program to inventory and upgrade all ISTS that are defined as imminent threats to public health by 2008 is expected to correct 300 to 500 systems. Financial assistance through this type of program and low-interest loans will help to increase the number of systems that are brought into compliance.

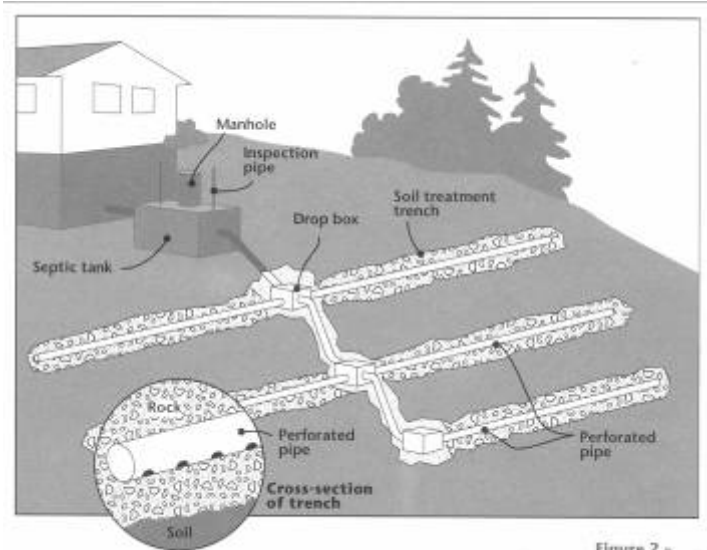


Figure 2 - Gravity flow to trench system

Projected Cost over 10 years: \$85,000 in-kind + \$721,000 = \$806,000

4. Sinkholes and other karst features create complex interconnections between surface water and ground water. Thin soils overlying fractured carbonate bedrock and sinkholes that bypass the soil filtration process allow contaminants to enter ground water with relative ease. Once in the subsurface, contaminants can move quickly with ground water through the enlarged conduits in a karst system potentially affecting drinking water wells which draw water from surficial karst aquifers. Education of the public about karst and the susceptibility of ground water to contamination is an important first step. Assistance will be provided to landowners for implementing BMPs that reduce runoff and increase water infiltration through existing and new programs. Increasing our understanding of karst and the interactions between surface water and ground water is also necessary for making good land use decisions.

Projected Cost over 10 years: \$62,000 in-kind + \$111,000 = \$173,000

5. Pesticide and fertilizer overapplication and mismanagement increase the risk of these compounds contaminating streams and ground water. Nitrate contamination of drinking water is common in wells that draw water from surficial bedrock aquifers. Atrazine and other pesticides are found at low levels in both ground water and streams all year round. Spikes in concentrations of atrazine, metolachlor (Dual), and acetochlor (Harness) are seen in early summer runoff oftentimes exceeding stream water quality standards. Alachlor (Lasso), which has not been used in the last decade, is found frequently at low concentrations in springs. Monitoring efforts will continue in cooperation with other agencies to monitor trends. BMPs must be adopted to keep these compounds out of streams and ground water. Nutrient management plans are needed to make the most efficient use of nutrients applied to cropland reducing the risk of environmental damage and reducing costs for farmers. Urban homeowners must also be aware of the impacts of overapplication of lawn and garden chemicals.

Projected Cost over 10 years: \$91,500 in-kind + \$145,000 = \$236,500

6. Livestock production is an important part of the local economy, and it also encourages the maintenance of permanent vegetation on the land. However, fecal coliform bacteria and nutrients in livestock manure can contaminate water resources if the manure is mismanaged on a feedlot or a manure application area. Adequate buffer areas around feedlots, practices that keep water from running through or off a feedlot, and well placed fencing can alleviate runoff problems from feedlots. Manure that is land applied at agronomic rates plus BMPs that control runoff ensure that the nutrients in manure are used effectively by crops without being transported to waterways from land application areas.



Projected Cost over 10 years: \$52,000 in-kind + \$1,000,500 = \$1,052,500

Consistency with Other Pertinent Local, State, and Federal Plans

Several plans were referred to in setting water quality goals and determining actions to take to achieve these goals. These plans include:

Minnesota Watermarks: Gauging the Flow of Progress 2000-2010

– MN Environmental Quality Board

http://server.admin.state.mn.us/pdf/2000/eqb/wtr_mrk.pdf

Lower Mississippi River 2001 Basin Plan Scoping Document

– Basin Alliance for the Lower Mississippi in Minnesota (BALMM)

<http://www.pca.state.mn.us/water/basins/lowermiss/lm-basinscoping2001.pdf>

Strategic Plan for Coldwater Resources Management in Southeast Minnesota 2004-2015

– MN Department of Natural Resources Division of Fisheries

http://files.dnr.state.mn.us/fisheries/management/coldwaterstrategicplan_semn.pdf

Regional Total Maximum Daily Load Study of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin of Southeast Minnesota Implementation Plan 2003

- MN Pollution Control Agency and BALMM

<http://www.pca.state.mn.us/publications/reports/tmdl-semn-fecalcoliform.pdf>

Plans from neighboring counties were also referred to in order to assure consistency with their water resource goals and objectives.

Priority Concerns Assessments

Soil Erosion and Runoff

Because of Fillmore County's rolling and often steep topography, any land use that disturbs the land cover has the potential for causing serious erosion problems. Fillmore County residents recognize the potential problems associated with erosion and runoff and the need for buffers and other soil conservation practices, more diversified agriculture that includes forages and small grains, and incentive programs that encourage landowners to maintain vegetative cover on the land. These practices not only reduce soil erosion, but also lower peak flows in streams, reduce stream bank erosion, and have the added benefits of protecting and recharging ground water.

Ground water recharge is especially important to maintaining the quality of the cold water trout streams in the county. The cool temperatures are a result of precipitation infiltrating into ground water where it is cooled so it can emerge in springs that feed the cold water streams. Poor land use practices that bypass this infiltration process and that increase surface runoff increase the transport of sediment, nutrients, and other contaminants directly into the streams and short-circuit the cooling process. Trout stream maps for southeast Minnesota can be seen on the DNR website at http://www.dnr.state.mn.us/fishing/trout_streams/pdf.html.

Trends in land use over the past two decades have shown a conversion from permanent vegetation, such as hay and pasture, to row crop production, especially soybeans. According to a report issued by University of Minnesota soil scientist Gyles Randall in 2003, residue left after soybean harvest is not adequate to protect against erosion in the late fall and in the spring before the next crop is planted even if conservation tillage is used. Soybeans also affect soil tilth and structure to make the soil more susceptible to erosion. His report concludes that the predominance of the present-day corn-soybean rotation is not sustainable economically, environmentally, ecologically, or socially in southeastern Minnesota.

Crop/ Animals	# of acres (year)	# in 1981 (% of total / rank in state)	# in 2001 (% of total/rank)	# (+) or (-) earliest stat to 2001	# (+) or (-) 1981 to 2001
Corn	73,000 (1930)	216,200 (59.8%)	165,500 (47.7% / #19)	+92,500	-50,700
Soybeans	10,400 (1950)	36,000 (10.0%)	107,300 (30.9% / #38)	+96,900	+71,300
Hay	102,800 (1940)	71,800 (19.9% / ranked #4 in 1974)	60,100 (17.3% / #4)	-42,700	-11,700
Oats	92,800 (1950)	36,300 (10.0% / #8)	12,300 (3.5% / #4)	-80,500	-24,000
Barley	43,500 (1930)	1,300 (0.04%)	500 (0.1%)	-43,000	-800
Sweet Corn			1,000 (0.2%)	+1,000	

Source: MN Extension Service and MDA Minnesota Agricultural Statistics, 2002

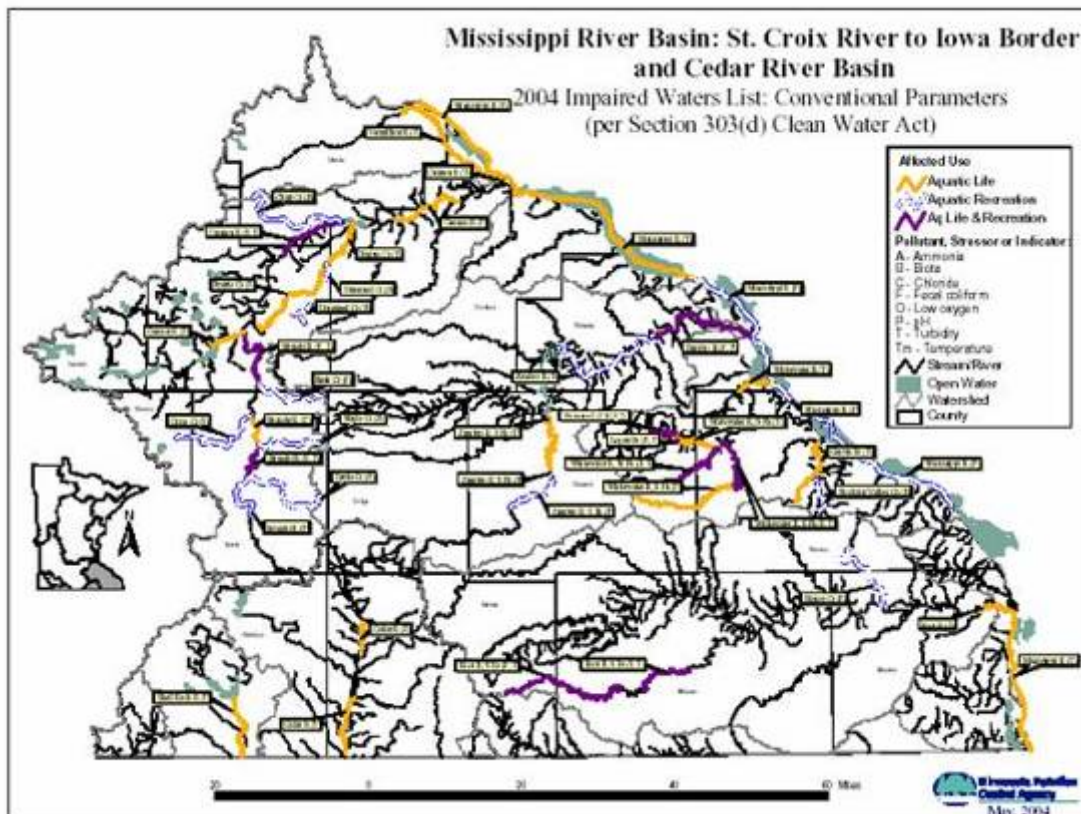
Land use is not the only factor affecting runoff. Since 2000, Paul Wotzka, MDA hydrologist, has observed that precipitation records have shown a shift toward a higher percentage (almost 50%) of

the annual rainfall coming in April, May, and June, a time when the soils are most vulnerable to erosion.

Crop residue transect surveys have been completed in the county for several years. According to the Conservation Technology Information Center at Purdue University (www.ctic.purdue.edu) which compiles the data nationwide, 2004 Fillmore County statistics showed that 29% of corn acres were in conservation tillage (>30% residue) and 39.9% were in reduced tillage (15% to 30% residue). Of the soybean acres, 71.9% were in conservation tillage and 19.8% were in reduced tillage. Overall, 45.1% of cropland acres in 2004 were in conservation tillage compared to 39.1% in 1995, which included spring seeded small grain. There were no spring seeded small grain acres surveyed in 2004.

An additional 97 sites representing 15,445 acres (equivalent to 37% of 42,000 acres of cropland) were surveyed in the South Branch Root River watershed project area. No-till accounted for 17% of the cropland plus 16% in reduced or ridge tillage. Half the acres were mulch-tilled. Pie charts that summarize the data from 2005 are found in the Appendix, page 50.

A segment of the South Branch Root River from its headwaters to the confluence with Willow Creek southwest of Preston has been placed on the 2004 303(d) Impaired Waters list submitted by MPCA to the U.S. EPA (<http://www.pca.state.mn.us/water/tmdl/index.html>) due to excess turbidity. This is based on data collected from 1999 to 2002 as part of a Clean Water Partnership Diagnostic Study of that portion of the watershed. Turbidity levels averaged 85 NTUs (nephelometric turbidity units), which is over 3 times the water quality standard of 25 NTUs for warm water streams and over 8 times the standard of 10 NTUs for cold water streams.



The Conservation Reserve Program (CRP) was enacted with the 1985 Farm Bill. From 1985 to 1995, about 50,000 acres were enrolled in the program in Fillmore County. The NRCS calculated that CRP reduced soil erosion in Fillmore County by 17.42 tons per acre per year for the acres enrolled. In 2004, there were 19,097 acres in CRP. The Conservation Reserve Enhancement Program (CREP) is expected to enroll 51,000 acres of marginal cropland in the Lower Mississippi basin in 45-year or permanent easements by the end of 2007. The Conservation Security Program (CSP) is a new federal program that rewards farmers for conservation already on the land which should encourage more adoption of soil conservation and water quality practices.

Annually, the Fillmore SWCD has approximately \$31,000 available in state cost-share funds to landowners to implement erosion and runoff control practices. Fiscal year 2005 was the first year in several years that the Fillmore Soil and Water Conservation District spent its entire allocation of state cost-share funds before the end of the fiscal year plus an additional \$10,000 in local SWCD funds. Almost 80% of those funds were used for installation of 35,000 feet of grassed waterways. Additional waterways are also installed through the Continuous CRP. Good woodland management also maintains healthy permanent vegetation. Grants available through the SWCD and DNR allow a landowner to develop a Woodland Stewardship Plan at no cost.

Storm water runoff from impervious surfaces in towns and other developed areas is becoming more of a concern as more development occurs in the county. Storm water systems typically

bypass treatment plants and discharge the storm water directly into streams and sometimes sinkholes. Contaminants can include grass clippings and leaves, automotive fluids, lawn chemicals, pet wastes, and litter, all of which can adversely affect water quality. Detention basins, pervious paving, rain gardens, and native plantings are just a few practices that can address storm water concerns created by development.



Stormwater detention basin in Lanesboro city park traps sediments before they enter the fishing ponds.

Road salt for de-icing roads has the potential to impact water quality during storage, use and disposal. County and state highway storage areas are now covered. However, in many towns snow is being stockpiled, along with the road salt collected with it. Salt use is being reduced in some parts of the state with the use of an ethanol by-product as a deicer.

Fillmore County has a soil erosion control ordinance (see section 722 in the zoning ordinance at <http://www.co.fillmore.mn.us/zoning.htm>) It was first adopted in 1982 and last revised in 1996. Although its main focus is on the control of erosion on agricultural lands, it does address erosion due to woodland activities and construction and subdivision activities. Road and other types of construction projects are potential sources of non-agricultural erosion, although they are not specifically covered in the ordinance. Enforcement action is complaint-driven and involves the SWCD and the township in determining if a problem exists and the methods to use to reduce the

erosion. A formal mediation process is initiated if the County and land occupier cannot reach agreement on an erosion control plan. The SWCD will contact a landowner with a letter prior to filing a formal complaint alerting the owner to an erosion problem and offering assistance to correct the problem. Enforcement proceedings are pursued only if the owner fails to make an attempt to correct the problem.

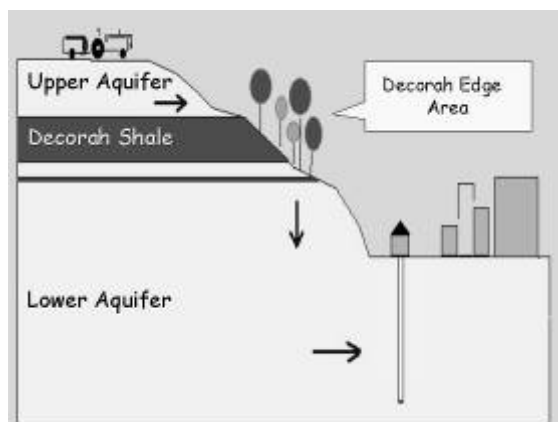
The county also enforces the DNR Shoreland regulations found in section 612 of the zoning ordinance at <http://www.co.fillmore.mn.us/zoning.htm> which apply to lands 300 feet landward of the ordinary high water level of all protected watercourses. Alterations of vegetation and topography are regulated “to prevent erosion into public waters, fix nutrients, preserve shoreland aesthetics, preserve historic values, prevent bank slumping, and protect fish and wildlife habitat.” General cultivation is permitted if the shore impact zone (within 50 feet of the ordinary high water level) is maintained in permanent vegetation or is operated under an approved conservation plan. Section 613 of the zoning ordinance regulates land use in the bluffland areas. The purpose, in part, is to control erosion on the steep slopes of the bluffs. Setbacks and other measures are related to those set out in the Shoreland rules.

Drinking Water and Source Water Protection

Fillmore County residents rely on ground water for their drinking water. The aquifer which supplies most domestic wells in the county is the St. Peter-Prairie du Chien-Jordan aquifer. Other aquifers of importance are the Upper Carbonate and the Franconia-Ironton-Galesville aquifers.

Ground water is part of the karst hydrologic system in which water table aquifers are especially susceptible to contamination. Thin soils overlying the carbonate bedrock provide minimal filtration of surface water as it migrates through the soil to the ground water. Only a small percentage of the county has more than 50 feet of soil cover over the bedrock. (See depth to bedrock map in the Appendix, page 51). If surface water enters a sinkhole, it directly enters the underlying bedrock where it can quickly travel both vertically and horizontally through the cracks and crevices in the bedrock. Sinkholes, springs, and other karst features create many interconnections between surface and ground water so that contamination affecting one often affects the other.

Aquifers that lie below a protective clay or shale rock layer, such as the Decorah shale, are less likely to become contaminated. The St. Peter-Prairie du Chien-Jordan aquifer is protected from



contamination where the Decorah shale is present (see Pollution Sensitivity map in the Appendix, page 52). This protective layer can be compromised, however, if it is penetrated by a poorly constructed well that is not cased or grouted. This allows contaminants from a surficial aquifer to be transported into deeper aquifers. Where the Decorah shale outcrops, water flows over the edge from the Upper Carbonate aquifer and recharges the St. Peter-Prairie du Chien-Jordan aquifer. (See diagram at left.) USGS studies in Olmsted County have documented the filtering properties of the Decorah

edge for removing nitrate from water in the upper aquifer as it moves through the vegetation and anaerobic soils at the Decorah edge. Based on this research, Fillmore County amended the zoning ordinance in 2003 to include a Decorah shale overlay district, which serves to protect the filtering properties of the Decorah edge.

County water test results from the Olmsted County Health Department date back to 1980. Over the past 20 years, about 23 percent of the water samples have nitrate-nitrogen levels above 10 parts per million (ppm), the state’s Recommended Allowable Limit (RAL) for private wells. Coliform bacteria were present in 38 percent of the samples that have been tested.

YEAR	TOTAL # OF SAMPLES	# WITH BACTERIA	% WITH BACTERIA	#>10 ppm NITRATE	% >10 ppm NITRATE
1984-1996	2488	889	36%	596	24%
1997	163	83	51%	30	18%
1998	181	98	54%	40	22%
1999	168	76	45%	46	27%
2000	221	94	43%	46	21%
2001	198	66	33%	29	15%
2002	159	67	42%	37	23%
2003	161	50	31%	30	18%
Totals	3739	1423	38%	854	23%

Since 1996, free nitrate clinics, co-sponsored with MDA and Fillmore County Public Health, have been offered each year in the county. Of 1282 samples that have been analyzed utilizing the MDA testing equipment, 320 have had nitrate levels greater than 10 mg/liter, which is 25% of the samples. This is consistent with the Olmsted County lab results. Although these results cannot be used to make generalizations about water quality in a particular aquifer, they do indicate the importance of proper well construction and proper management of contaminant sources in proximity to a well. Of the 4200 domestic well records in the County Well Index (CWI), about 75 percent have no well construction information indicating that they were constructed prior to the implementation of the state well code and are probably not cased and grouted properly. A majority of rural residents are still using these wells as a primary source of water for domestic uses. From 2000 to 2004, about 330 new wells were constructed and 190 wells were abandoned and sealed, so some of the older wells are gradually being replaced with new cased and grouted wells. The SWCD does offer cost-share for the sealing of abandoned wells through its state cost-share program.

All the cities in Fillmore County except Whalan have public water supply wells. A new well was installed in Whalan in 2005 which serves nine homes. This allowed several sandpoint wells to be sealed, which in turn allowed new septic systems to be installed and meet the setback requirements that had previously prevented their installation. Preston constructed a new well in 1998 and completed a Wellhead Protection Plan, which was approved in 2004. Chatfield is in the process of completing part two of its Wellhead Protection Plan, which is expected to be completed in 2005. Chatfield's water supply is considered to be vulnerable to contamination. The water supplies for Harmony and Canton are also considered vulnerable and will begin wellhead protection planning in the near future. Rushford constructed a new well and is expected to have a wellhead protection plan done by 2007. Problems with radium in the water from the new well prompted them to blend the water with that from another well to dilute the radium. Public water supply wellhead protection plans have the potential to protect the drinking water for over 50% of the county's population. (For more information about wellhead and source water protection, see the MDH website at <http://www.health.state.mn.us/divs/eh/water/swp/swa/index.htm>.)

Radon is an odorless, colorless, and tasteless gas that comes from decaying uranium and radium deposits in the soil. Radon may be found in home air or water. According to the EPA, it is recommended that radon in home air be below a level of 4 pCi/L. Radon in water may also contribute to household radon levels. For every 10,000 pCi/L of radon in water the air radon level in a home is increased by 1 pCi/L. Home air radon levels in Fillmore County are a significant problem because roughly 50% of all homes tested have levels greater than 4 pCi/L. Because radon in the air is a significant issue, Fillmore County Public Health was interested in determining if water levels were significantly contributing to these air radon levels. From February 2002 to November 2003, Fillmore County Public Health distributed 120 kits to test for radon in water. The radon in water tests ranged from 0 to 4,379 pCi/L with an average of 301 pCi/L. Although this was a small sampling, it does appear from this data that radon in water is not making a significant contribution to home air radon levels.

MDH completed a Nitrate Exposure and Infant Risk study that concluded that better education is needed for caregivers and health care providers in regions where drinking water is at high risk for nitrate contamination. A significant percentage of the participants in the study reported never having their well water tested or not having a test done in the last five years. Most reported that they had not discussed the problem with their health care provider. For more information about the study, go to <http://www.health.state.mn.us/divs/eh/hazardous/topics/nexirsummary2003.pdf>.

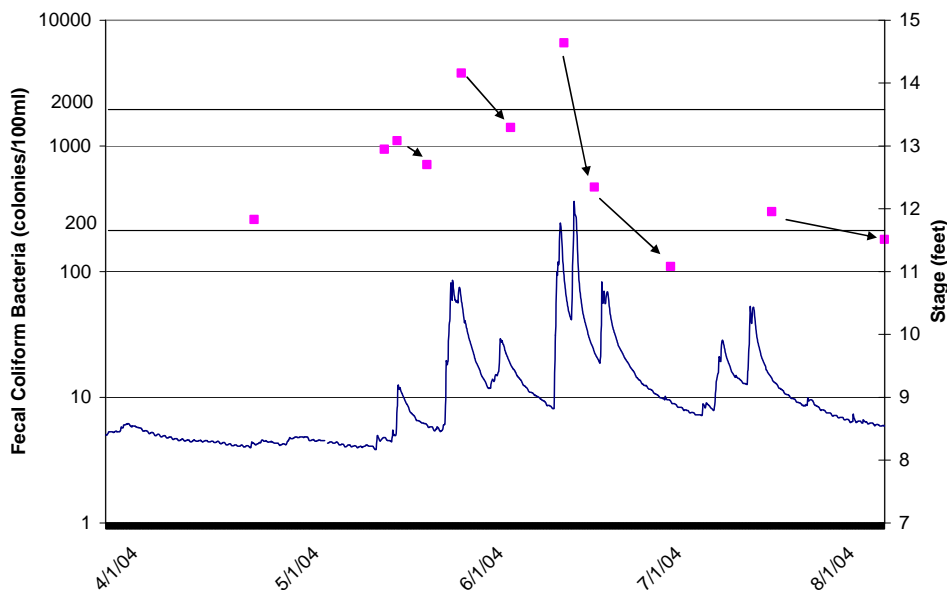
The SE MN Water Resources received grant funds from the U.S. EPA to pilot a process for inventorying motor vehicle shop Class V Injection Wells, also known as shallow disposal systems. According to a new rule issued by EPA (<http://www.epa.gov/safewater/uic/c5imp.html>), any motor vehicle shop with a floor drain discharging below ground and situated in a sensitive area will need to modify that drain by January 2006. Alternatives to a floor drain include plugging the drain and operating a dry shop, installing a holding tank, or connecting to a municipal sanitary sewer system. Almost all of Fillmore County is considered a sensitive area. Only two shops were identified that were not connected to a municipal sanitary sewer system. EPA will be working with them to correct the problem. In addition to the motor vehicle shop systems, there were nine industrial Class V systems identified in sensitive areas ranging from car washes to beauty shops that are discharging wastewater underground. Minnesota Rules Chapter 7080 which regulate individual sewage treatment systems do not regulate wastewater that includes industrial or animal waste or that contains hazardous materials.

Public water suppliers in communities of over 1000 in population will have to update their DNR Emergency and Conservation Plans. More information about these plans is on the DNR website at www.dnr.state.mn.us

Human Sewage Treatment

According to the 2000 census, there are 3830 households in the rural areas of Fillmore County, an increase of 550 (17%) over the 1990 census figures. Most of these residences are not connected to municipal sewer systems and rely on individual sewage treatment systems (ISTS) for wastewater treatment. From 2000 through 2004, the Fillmore County Zoning office has issued 621 ISTS permits. Combined with about 500 permits issued from 1995 to 1999, about 30% of the rural households have systems that are compliant with current Minnesota Rules Chapter 7080. The remaining two-thirds that are not permitted have the potential to contaminate water with bacteria and other pathogens as well as excess nutrients. Bacteria levels in streams are highest during runoff events. The following graph from monitoring of the South Branch Root River in 2004 illustrates this relationship. (Note that the scale for bacteria numbers is logarithmic.)

South Branch Root River - Forestville



Fillmore County has adopted and enforces Chapter 7080. Due to staff additions and a contract with the SWCD, almost 100% of newly installed septic systems are now inspected. Review of system designs has reduced problems by catching problems before construction begins. There are 22 contractors licensed by MPCA that design, install, inspect, or pump ISTS in the county.

There are nine unincorporated villages -- Bratsberg, Cherry Grove, Fillmore, Granger, Greenleafon, Highland, Lenora, Newburg, and Prosper -- which have clusters of houses on small lots with inadequate sewage treatment systems. With assistance from the SE MN Wastewater Initiative, several residences in Granger have received financial assistance to install compliant ISTS after disconnecting from a sewer line that discharges to the Upper Iowa River. The Granger

Cooperative Creamery also received assistance after being cited by the Iowa DNR for discharging milk can wash water to the Upper Iowa. A significant portion of the wash water contained cooling water which is now permitted to discharge to the river, while the smaller amount of wash water is treated in an in-ground drainfield. Community sewage treatment options will be explored with Cherry Grove and Greenleaf and any other interested communities as resources allow.

All the cities except Whalan have municipal wastewater treatment facilities. Ostrander, Mabel, and Canton have upgraded their facilities in the last five years. Whalan has received assistance from the SE MN Wastewater Initiative with investigating options for sewage treatment. Nine homeowners have cooperatively drilled a new well which allows them to seal old sandpoint wells which reduced the amount of space available for new ISTS. All nine should be able to install compliant ISTS.

In 2003, the SE MN Wastewater Initiative developed a septic system survey which was mailed to 3300 homes (300 in each of 11 counties). An astounding 44% responded (1461 surveys returned). Fillmore County had a 41% response rate. Nearly all respondents said that they would repair or replace their systems if not working and that homeowners with contaminating systems should be required to do the same. Concern about drinking water quality was the biggest motivator for repairing a system. However, the survey highlighted a gap between the respondents' understanding of the definition of a system that is not working and how that is defined by the regulating agencies. Over half of the respondents said that more needs to be done to address the issue of water contamination from malfunctioning septic systems. Most did not cite financing as a reason for not upgrading or pumping a system suggesting that the availability of low-interest loan programs would provide the necessary assistance to upgrade the systems. A self-audit booklet for homeowners to evaluate their own system was piloted in the South Branch Root River watershed project area where almost 400 were mailed. The response rate was low using this method of distribution, although some people may have done the self-audit without mailing back the response postcard.

In 2004, Fillmore County was awarded one of three grants statewide from the MPCA Three-County ISTS Pilot Program. The funds are being used to inventory all the imminent threat to public health (ITPH) systems by 2007 and have all ITPH systems upgraded by 2008. (An ITPH is defined as a system which discharges untreated sewage to the surface or backs up into a residence.) After about six months of site visits, approximately 5-10% of the sites have had systems identified as ITPH. About 70% of the grant funds are being used for a \$300 incentive grant given to homeowners with an ITPH system who upgrade their septic systems and attend a homeowner operation and maintenance workshop. As of April, 2005, 40 homeowners had signed up for the \$300 grant and 59 had attended a homeowner workshop. There are enough funds for about 550 incentive grants.

Sinkholes and Karst Hydrology

Fillmore County has been called the "Karst Capital of Minnesota." With over 6000 sinkholes and 850 springs that have been mapped (see the sinkhole probability map in the Appendix, page 53), the county is believed to have more karst features than the rest of southeast Minnesota combined. Fillmore County is also home to two commercial caves: Mystery Cave, which is managed by the

MN DNR, and Niagara Cave, which is privately operated. Both have formations that are among the most unique found in the Midwest and the country. Four blind valleys are known in the county: Fairview, Lefevere, York, and Cherry Grove. Numerous streams are known to be disappearing streams, including the South Branch of the Root River, which often has a dry streambed for about five miles of its length between Mystery Cave and Seven Springs during late summer and fall.

Karst is defined by Klimchouk and Ford (2000) as “an integrated mass-transfer system in soluble rocks conduits dissolved from the rock and organized to facilitate with a permeability structure dominated by the circulation of fluid.” Karst is not just the number of sinkholes on the landscape, but the whole system, including the subsurface, all of which is shaped by the flow of water through the system.

Reference: Klimchouk, A., and Ford, D., 2000, Types of karst and evolution of hydrogeologic settings, in *Speleogenesis: evolution of karst aquifers*, Klimchouk, A., Ford, D., Palmer, A., and Dreybodt, W., eds.: Huntsville, AL, National Speleological Society, p 45-53.

Since 2000, most of the dye trace studies that have been completed have been in the South Branch Root River watershed project area as part of a Clean Water Partnership Diagnostic Study. One new, previously unknown springshed was mapped just west of Forestville State Park. The discharge point is a spring on the South Branch Root River that was previously assumed to feed into springs along Forestville Creek because the surface drainage flow is to Forestville Creek. This is a prime example of springshed boundaries not always matching surface watershed boundaries. A portion of the east side of the basin mapped as draining to Canfield Big Spring was found to actually be part of Rainy Spring, a tributary to Canfield Spring. Dye travel times were generally in the one to three miles per day range. In 2004, dye traces were conducted in Lost Creek watershed in Jordan Township to fill a gap in the springshed map. The traces helped delineate the boundary for the springshed for spring A17. The dye was also detected in the landowner’s private well. Dye trace studies will continue as part of the South Branch Root River Fecal Coliform Bacteria Reduction 319 Implementation Project from 2005 to 2007 and in the South Fork of the Root River watershed as part of a project to improve nutrient management planning. A map of the dye traces that have been completed is in the Appendix, page 54.

Sinkholes have been convenient dumping grounds for garbage, dead animals, tile discharge, highway runoff, and sewage lines. The county does have a sinkhole ordinance which prohibits dumping of anything but fill dirt and unprocessed wood and construction materials into a sinkhole. Some recent concerns have arisen about the definition of construction materials and what should or should not be allowed in a sinkhole. A review of the ordinance language is suggested as well as strengthening enforcement.

As mentioned in the drinking water section, a Decorah shale overlay district was added to the Zoning Ordinance in 2003. This unique geologic setting extends north to the Twin Cities and south to Dubuque, Iowa. It serves an important function in filtering nitrate from water in the Upper Carbonate aquifer as it moves over the edge of the Decorah shale outcrops and recharges the St. Peter-Prairie du Chien-Jordan aquifer. A USGS study in Olmsted County estimated that 18,000 gallons/linear foot/year flow over the Decorah edge. Structures built in this setting must be located properly to avoid extensive water damage. Because of the steep, wet conditions often associated with this setting, much of it has not been developed and has maintained its native

vegetation. The MN Biological Survey maps have documented that many well-preserved native plant communities still exist in this setting. The Decorah Shale Overlay District has three purposes: 1) to maintain the filtering properties of the Decorah edge, 2) to protect structures from water damage, and 3) to protect the unique and diverse plant communities found in this setting. A map showing the extent of the Decorah edge is in the Appendix, page 55.

Awareness appears to be growing about karst and the special care needed in making land use decisions that account for the sensitivity of ground water in a karst system even where karst features are not readily apparent on the land's surface. In this three-dimensional karst system, practices that hold water, nutrients, soil, and chemicals where they belong not only benefit surface water but also ground water.

Pesticide and Fertilizer Use

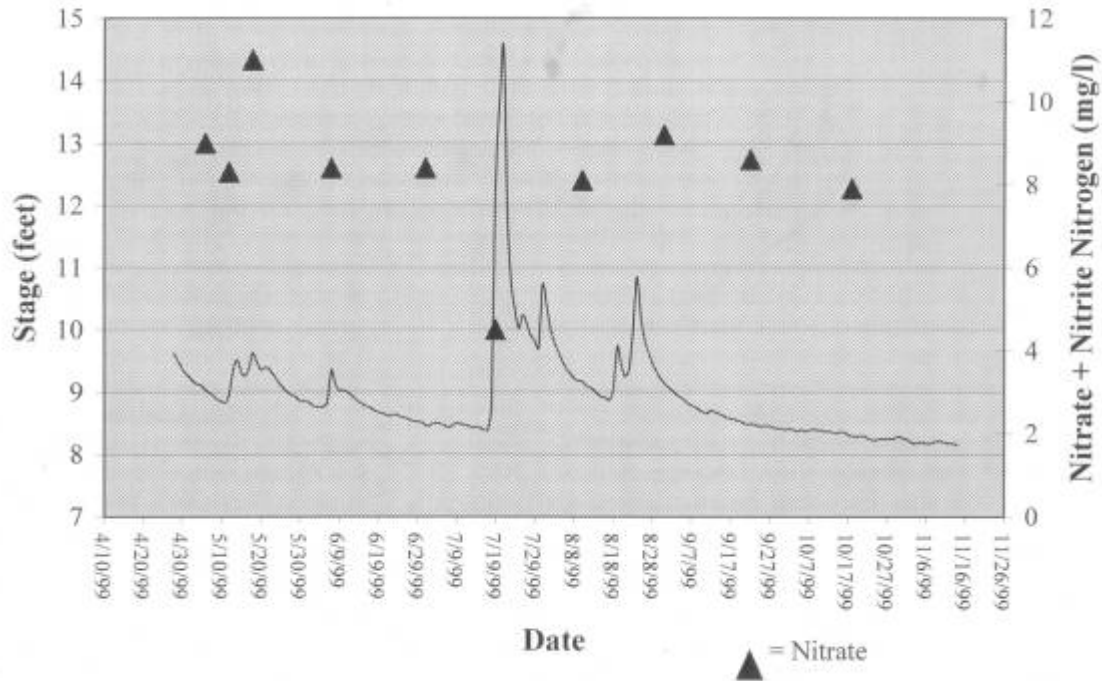
Modern agriculture has become increasingly dependent on purchased chemical inputs to meet higher yield goal expectations. Although concerns about non-ag uses of pesticides and fertilizers are valid, the fact that most of the land in the county is in row-crop production forces us to focus heavily on the agricultural uses of these chemicals. The high number of wells with elevated nitrate levels, increasing nitrate levels in our rivers and streams, phosphorus loss associated with soil erosion, and the detection of some commonly used pesticides in ground water, springs, and streams, all illustrate the need to implement land use practices that will reduce their concentrations in our waters.

According to a 1991 report entitled "Nitrogen in Minnesota Ground Water" prepared by MPCA and MDA, the biggest contributor of nitrogen in Minnesota ground water is commercial fertilizer. Other sources include overapplication of manure and malfunctioning septic systems. Crop rotations can also affect nitrogen losses according to Gyles Randall, University of Minnesota soil scientist. He has calculated that nitrogen loss from fields with continuous corn is 30 lb./acre compared to alfalfa at 1.6 lb./ acre. Tile drainage is also documented as exacerbating nitrogen losses. Excess nitrogen in streams in the Upper Midwest that flow to the Mississippi River has been linked to hypoxic conditions in the Gulf of Mexico resulting in a dead zone where marine life cannot survive.

From the final report for the South Branch Root River watershed diagnostic study completed in 2002, nitrate flow-weighted mean concentrations ranged from 7.5 mg/L in 2000 at the Forestville site to 13.7 mg/L at the upper site in Mower County in 1999. Compare these to the average concentration for the entire Root River near its mouth for the decade of the 90s, which was 3.9 mg/L according to MPCA data compiled in 1999. The South Branch transported 1.6 and 1.9 million pounds of nitrogen in 1999 and 2000, respectively, just from this 74,000-acre watershed project area. In the uppermost portion of the watershed, which is heavily drained, the nitrate yields were 50 lbs./acre in 1999 and 67 lbs./acre in 2000. Upper Iowa River monitoring shows similar concentrations with the highest coming from watersheds where drainage is prevalent. This is a significant economic loss for farmers as well as a threat to water quality. Although streams are not used as drinking water sources, in losing streams, ground water impacts are probable. Nitrate concentrations tend to be lowest during high flow events due to dilution and highest during base flow conditions. The following graph shows results from 1999 monitoring from the South

Branch Root River watershed diagnostic study that shows this relationship. During lower stage readings, nitrate concentrations were the highest, but dropped during the biggest runoff event.

Lower South Branch Water Level and Nitrate Concentrations



Phosphorus losses calculated as part of the South Branch Root River diagnostic study were equally as troubling. Losses were highest in the middle portion of the watershed where land use practices were similar to the western part of the watershed, but the landscape becomes steeper. Total phosphorus flow-weighted mean concentrations ranged from 0.108 mg/L at the upper site in 2000 to 0.394 mg/L at the middle site in 2000. The river transported 57,000 and 100,000 pounds of phosphorus in 1999 and 2000, respectively. Phosphorus yields ranged from 0.4 to 1.7 lbs./acre. Phosphorus losses tend to be highest during high flow events when soil erosion is worst since it is attached to soil particles.

Pesticide monitoring began in 2002 at three Root River sites, one each on the South Branch, North Branch, and South Fork of the Root. Monitoring also began at six fish hatchery springs, four of which are in Fillmore County at the Lanesboro and Peterson hatcheries. Samples are collected during early summer runoff events and during mid-winter base flow. In 2004, the North Branch site was taken over by Eagle Bluff Environmental Learning Center, which also added a permanent monitoring station. Of the 29 compounds that are monitored, only a handful are of concern because 95% of what is detected, both in terms of magnitude of concentration and frequency, fall into just two categories: triazines and chloroacetamides. Concentrations are lowest in base flow and highest in the early summer runoff, sometimes as high as 100 times the base flow concentrations. The compounds most often detected are atrazine, metolachlor (Dual), and

acetochlor (Harness). In the springs, alachlor (Lasso), a compound that has not been used in significant amounts for the last decade, is frequently detected. Graphs in the Appendix (pages 56-58) summarize the 2004 monitoring results.

Atrazine is detected almost 100% of the time in both the river and the springs. A common misconception among producers is that atrazine is no longer used. However, atrazine is part of many of the tank mixes on the market, and about 80 million pounds are still used in the U.S. It is true that atrazine use has dropped from several pounds per acre in the past to an average of 0.75 lbs/acre according to an MDA study in the South Branch Root River watershed. Since pesticide monitoring began on the Middle Branch of the Whitewater in 1993, atrazine has increased significantly starting in 2000. One possible explanation is the conversion of CRP acres to cropland beginning in 1996 which would increase the use of atrazine. Also, after a few years, the organic matter in these converted CRP soils breaks down allowing more runoff and losses of atrazine. Atrazine concentrations exceeded the stream water quality standard of 3.4 microgram/Liter (ug/L) at least once at each of the three Root River monitoring sites each year. Concentrations in the springs were always less than 1 ug/L.

Emerging research indicates a link between atrazine and frog deformities. Atrazine suppresses the immune system which leaves frogs more susceptible to parasites that produce the deformities. Atrazine exposure also creates feminizing effects in male frogs, such as male frogs with both ovaries and testes, eggs in the testes, and inhibition of larynx growth decreasing the size of the voice box and their ability to call during mating. All these consequences may help to explain the decline in amphibian populations. Amphibian hormones are almost identical to mammalian hormones raising concerns for health consequences in humans also. More information about this research can be found at www.nationalgeographic.com/emerging/tyroneHayes.html which also has other associated links.

Glyphosate (Round Up) is now one of the most widely used pesticides with the advent of genetically modified varieties of Round Up-ready corn and soybeans. Glyphosate breaks down relatively quickly and is not readily soluble in water, so it does not appear to be a water quality concern at this time. Soybean rust may increase the amount of fungicides used raising some concerns about the effects on beneficial soil fungi known as mycorrhizae. These emerging issues and new research highlight the need for continued monitoring to track these compounds in the environment.

MDA completed one of the largest surveys ever conducted on pesticide use in Minnesota in 2004. A report from that study, which looks at pesticide use in the 2003 cropping year, can be found at <http://www.mda.state.mn.us/appd/pesticides/pesticideuse2003.pdf>. In Fillmore County, the top four compounds applied were the herbicides glyphosate (4,505 pounds active ingredient), acetochlor (3,831 pounds A.I.), atrazine (2,274 pounds A.I.), and metolachlor (1,872 pounds A.I.).

In Fillmore County, the USDA 2002 Census of Agriculture states that 886 farms used commercial fertilizer, down from 1,015 in 1987. However, the number of acres on which commercial fertilizer was used increased from 185,903 acres in 1997 to 207,411 acres in 2002. Herbicides were used on 159,971 acres in 2002 as compared to 149,971 acres in 1997. (USDA National Agricultural Statistics Service, http://151.121.3.33:8080/Census/Pull_Data_Census.)

The local office of the University of Minnesota Extension Service conducts annual Private Pesticide Applicator Training (PPAT) meetings. There are 624 certified private pesticide applicators in Fillmore County, about 50 less than five years ago. An increasing number of farmers hire commercial applicators for applying herbicides, reducing the risks they would have with storage and handling of the chemicals on their farms. The use of fungicides, such as those for control of soybean rust, will require certification.

The Institute of Environmental Assessment in Brooklyn Park, Minnesota, conducted a pesticide survey which included the counties of Fillmore, Houston and Winona. Ninety-nine surveys were returned from these counties, of which 63 were on a municipal water system. In answer to the question, "Do you personally apply pesticides?" 39% replied yes to applying lawn pesticides while only 12% answered yes to applying to farm crops. This indicates a need to educate homeowners about BMPs for lawn chemical application. Homeowners need to be aware of a new MN law that went into effect January 1, 2005, which prohibits the use of fertilizers with any phosphorus except where soil tests indicate a need or when establishing a new lawn.

Feedlots and Manure Management

Livestock production has economic and environmental benefits for Fillmore County. The hilly terrain in much of the county is not suitable for row crop production but is conducive to animal production. This land can be productive and have economic benefits if used for pasture, forages or small grains for livestock feed. With proper management, these land uses can reduce soil erosion and sedimentation of our streams as well as reduce fertilizer and pesticide use associated with row crop production. According to the 2002 Minnesota Agricultural Statistics published by the MDA, cash receipts from livestock were over \$90 million in 2000 in the county compared to \$52 million from crops and \$28 million from government payments.

Demographics and economics are changing livestock production. The number of farms with cattle and calves dropped by about 100 to 779 in the five years from 1997 to 2002. Hog farms saw a similar decrease in that five-year period. Fillmore County remains the top county in the state in beef cow production with 18,100 beef cows in 2002. County feedlot staff have noted an increase in smaller (<100 animal units) cow-calf operations which have some confinement in the winter but are on pasture the rest of the year. The number of dairy facilities has been dropping, but dairy cow numbers remain about steady.

In 2000, Fillmore County hired a full-time County Feedlot Officer (CFO). The first task accomplished by the CFO was registration of all the feedlots in the county by January 1, 2001. In 2002, the Soil and Water Conservation District hired a full-time engineering technician to work mainly on feedlot runoff control projects. Funding assistance from a 319 grant awarded to the SE MN Water Resources Board helped pay for this position. In addition, a "retired farmer" was hired to begin contacting feedlot operators about signing Open Lot Agreements (OLA), which provided the operator with protection from enforcement action and allows them time to achieve 50% control of feedlot runoff by October of 2005 and 100% by 2010. Results are shown below. Priority areas are those within 300 feet of a stream or a sinkhole or other karst feature.

1) Open Lot Agreement Results (cumulative)

	Total # in county	Total # in priority areas
Feedlots under 300 A.U. that have been registered	1092	610
Producers who should be enrolled in the OLA because the feedlot poses a problem (that is, the runoff could reach surface water)	600	300
OLA's which have been signed	291	190
OLA plans developed for partial fixes (50% runoff reduction)	95	95
OLA plans implemented for partial fixes (50% runoff reduction)	3	3
OLA plans developed for complete fixes (100% runoff reduction)	95	95
OLA plans implemented for complete fixes (100% runoff reduction)	60	60

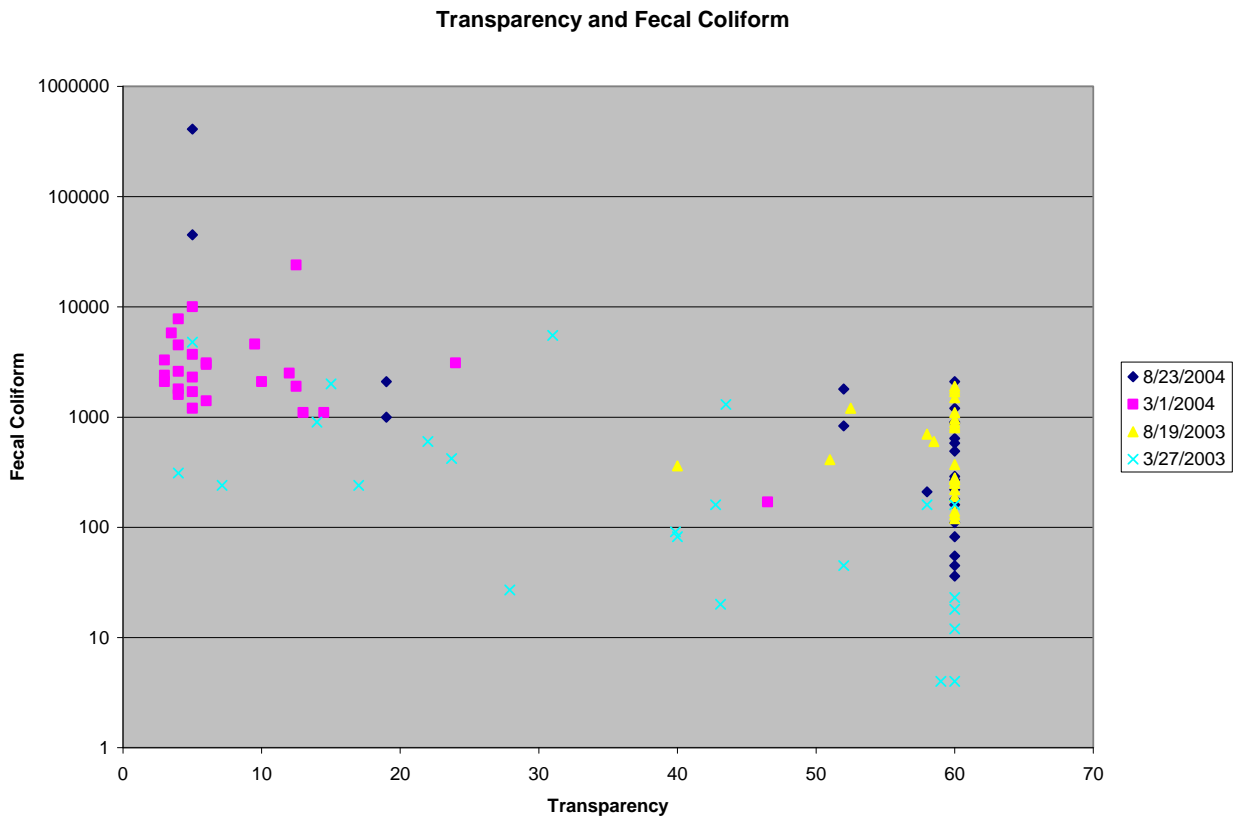
2) Manure Management Planning Results (cumulative)

ACTIVITIES	Total # in county	Total # in priority areas
Number of contacts made with producers about manure management	1500	360
Number of requests for manure management plans	35	30
Number of approved manure management plans	11	11
Number of animal units covered by manure mgt. plans	2100	2100

Fillmore County has administered Minnesota Rules Chapter 7020 since 1994 when it became a delegated county. The county's ordinance was adopted in 1989 and was last revised in 2003. (See <http://www.co.fillmore.mn.us/Web%20Documents/Zoning%20Documents/2004%20Feedlot%20Ordinance1.pdf>.) The ordinance was revised to include use of the OFFSET model to determine odor impacts from new or expanding facilities. Biofilters are allowed as a method for reducing odors. Fillmore County processes feedlot permit applications for facilities up to 1000 animal units in size. A permit application is completed if: 1) a new feedlot is constructed, 2) a feedlot is expanded or modified, 3) a change in ownership takes place, or 4) if a potential pollution hazard exists either on the feedlot site or a manure application site. Site visits are conducted whenever a

permit application is filed. A karst investigation is done and setbacks are determined to meet all zoning requirements.

Controlling runoff from open lot feedlots and proper manure management when the manure is land applied are key to protecting water quality. Potential water contaminants from manure include the nutrients nitrogen and phosphorus, ammonia, fecal coliform bacteria and disease-causing organisms, antibiotics and antibiotic-resistant bacteria, and organic materials which add to Biological Oxygen Demand (BOD). The Total Maximum Daily Load set by EPA for fecal coliform bacteria has been exceeded in the South Branch of the Root River for the watershed west of Forestville/Mystery Cave State Park. Annual monitoring of 25 subwatersheds in the county for fecal coliform bacteria and ammonia is being used to identify areas where feedlot or manure runoff may be impacting streams. North Jordan Creek is one with consistently high bacteria numbers that may be feedlot related. The graph below shows the relationship between fecal coliform bacteria and transparency (note the logarithmic scale for fecal coliform) for these 25 sites. As transparency increases (clearer water, less runoff), bacteria levels tend to decrease.



When properly managed and land-applied, the nutrients from manure can be a valuable resource for crop production, the organic matter can improve soil quality, and the other contaminants can be broken down and treated by soil-dwelling organisms and sunshine. Balancing the benefits of livestock production with the risks associated with manure will hinge on implementation of BMPs which the county and natural resource agencies can encourage.

Priority Concerns Objectives and Actions

Soil Erosion and Runoff

Objective 1: Conduct annual education and information programs for county residents and local officials about land use practices that reduce runoff and erosion.

Action 1.A. Promote the use and establishment of annual and perennial cover crops and living mulches in conjunction with traditional row crops through education and seeking cost-share funding for practice establishment and maintenance.

Action 1.B. Communicate with state and federal legislators regarding ways to improve state and federal conservation programs through better coordination and simplification of program policies.

Action 1.C. Pursue funding for a pilot project to develop binding but simplified farm plans that model “managed set aside” which utilizes sensitive areas as working lands that are profitable and environmentally-friendly.

Action 1.D. Provide education about the safe use and storage of road salt and effective alternatives to salt use, such as ethanol by-products and living snow fences.

Action 1.E. Promote soil and water conservation in the schools by providing information, assistance, and educational tools that enhance coursework about natural resources.

Action 1.F. Provide information about practices that reduce runoff and increase water infiltration in urban areas, from construction sites, logging areas, and other land uses that disturb land cover or replace vegetation with impervious surfaces.

Objective 2: Increase watershed-based activities in cooperation with other local units of government for more effective management of water bodies targeted for improvement.

Action 2.A. Provide representation from Fillmore County on the Upper Iowa River Alliance (UIRA) and other watershed groups working to improve water quality in the Upper Iowa and Root River watersheds.

Action 2.B. Work with DNR Fisheries to identify and implement management strategies for trout stream watersheds and springsheds that will maintain or improve stream conditions for sustaining a healthy fishery.

Action 2.C. Facilitate coordination with other local and state agencies to complete 319 grant projects and programs for the South Branch Root River watershed project as defined in project workplans.

Action 2.D. Work with transportation agencies and the DNR to investigate strategies for bridge and culvert replacements starting in the upper portions of watersheds where temporary water storage can be incorporated to reduce peak flows and allow size reduction of downstream bridges and culverts in those watersheds.

Objective 3: Gather information and data to more effectively identify areas in the county contributing pollutants to streams determined to be impaired for their intended uses and listed on the Clean Water Act Section 303(d) impaired waters list.

Action 3.A. Support and expand volunteer monitoring through the MPCA Citizen Stream Monitoring Program, IOWATER, and other programs that add to the understanding of the condition of water resources in the county.

Action 3.B. Establish and maintain data management systems that allow for easy access and analysis of water related information utilizing GIS capabilities.

Action 3.C. Cooperate with local, state, and federal agencies in assessing water quality and quantity in county streams and rivers.

Objective 4: Utilize local ordinances and permitting procedures to ensure that erosion and runoff control measures are implemented.

Action 4.A. Review, clarify and improve enforcement of the county's soil loss ordinance requirement for erosion control plans for activities that disturb more than one acre of land.

Action 4.B. Review, clarify and improve enforcement of the shoreland ordinance and bluffland protection ordinance and other zoning measures that establish and maintain buffers in sensitive areas and implement other BMPs that protect water resources.

Drinking Water Quality and Source Water Protection

Objective 1: Conduct annual education programs that increase awareness of the importance of protecting drinking water supplies and ground water resources.

Action 1.A. Promote well water testing through the local media and other educational methods and by providing free and/or reduced cost water testing for county residents in cooperation with Fillmore County Public Health utilizing MDA nitrate testing equipment and funding resources as available, such as the South Branch Root River watershed project 319 grant, that reduce the cost to the homeowner.

Action 1.B. Promote BMPs through education and financial incentives, when available, that protect drinking water wells from potential contamination, such as abandoned wells, septic systems, methamphetamine lab wastes, and other pollution sources found on a home site.

Action 1.C. Assist public water suppliers with completing wellhead protection plans and DNR Emergency and Conservation Plans.

Action 1.D. Promote water conservation through education and incentives, as funding allows.

Action 1.E. Develop a county revolving fund for well sealing and replacement.

Action 1.F. Provide information to health care providers and caregivers about drinking water contaminants that pose a risk to children and other susceptible populations and how to test for them.

Action 1.G. Assist farm fuel tank owners with upgrading their tanks through information and incentives to implement preventive practices, such as secondary containment and automatic shutoff nozzles.

Action 1.H. Promote shared wells in subdivisions whenever feasible.

Objective 2: Maintain local data and information related to public and private water supplies and their protection.

Action 2.A Maintain and update well location, construction, and sealing information in the County Well Index utilizing GIS in cooperation with MDH and MGS.

Action 2.B. Support and encourage ground water monitoring efforts, such as the volunteer nitrate monitoring network, with the SE MN Water Resources Board, the MPCA, MDH, MDA, and others to increase understanding of ground water quality and quantity in the county.

Human Sewage Treatment

Objective 1: Bring 50% of noncompliant septic systems into compliance.

Action 1.A. Implement financial assistance programs that encourage homeowners to upgrade noncompliant systems by expanding to the entire county the Clean Water Partnership loan program currently in place in the South Branch Root River watershed, which is administered by the county and allows repayment through property taxes, and by continuing the Ag BMP Loan Program.

Action 1.B. Inspect 100% of newly installed septic systems by county and SWCD staff to ensure compliance with Minnesota Rules Chapter 7080.

Action 1.C. Complete the MPCA Three-County ISTS Pilot Program by inventorying all septic systems that are an imminent threat to public health (ITPH) by 2007 and upgrading all ITPH systems by 2008. Utilize the results from the pilot program to develop future programs that encourage compliant ISTS.

Action 1.D. Work cooperatively with residents in the unsewered communities of Cherry Grove and Greenleafton or other interested communities to determine sewage treatment options for those communities in cooperation with the SE MN Wastewater Initiative and pursue funding to assist residents with improving their sewage treatment systems.

Action 1.E. Adopt a zoning ordinance amendment that requires an ISTS inspection at the time of property transfer.

Objective 2: Conduct annual education programs about the benefits of proper sewage treatment and proper operation and maintenance of septic systems.

Action 2.A. Utilize a variety of tools and methods, i.e. workshops, models, demonstrations, displays, articles, etc., to educate various audiences about proper sewage treatment and upkeep of ISTS.

Action 2.B. Assist with promoting and staffing the county's annual Household Hazardous Waste collections as a practice that can protect ISTS from improper disposal of hazardous wastes.

Action 2.C. Promote water conservation to homeowners as a way to extend the life expectancy of their ISTS.

Action 2.D. Provide education to lenders and realtors regarding the benefits of requiring an ISTS inspection at the time of property transfer.

Sinkholes and Karst

Objective 1: Conduct annual education programs for county residents and local officials about karst and the unique hydrology that increases the risks for ground water pollution.

Action 1.A. Promote efforts that reduce dumping in sinkholes, such as the annual Household Hazardous Waste collections, the cooperative program with Winona County to collect waste pesticide containers, and other efforts that discourage pollutants entering sinkholes.

Action 1.B. Utilize educational materials about karst with a variety of audiences, such as rotating the karst display and karst trunks in the schools, and develop new materials as needs arise.

Objective 2: Review existing ordinances and rules to assure that karst conditions are considered in approving land uses that have the potential to impact water resources.

Action 2.A. Review the effectiveness of the karst review for all feedlot permit applications to assure that all requirements relating to karst for compliance with Minnesota Rules Chapter 7020 and the local feedlot ordinance are adequate for protection of water resources.

Action 2.B. Review the language in the current county sinkhole ordinance relative to the dumping or burying of demolition and construction materials to assure protection of water quality. Ensure enforcement of the ordinance in cooperation with townships and the DNR.

Action 2.C. Review provisions in the Decorah Shale Overlay District for their effectiveness in protecting the water filtering function of this geologic setting.

Objective 3: Implement practices which reduce the potential for pollution of ground water and surface water in a karst system.

Action 3.A. Provide incentives through programs such as the Conservation Reserve Program (CRP), Conservation Reservation Enhancement Program (CREP), Conservation Security Program (CSP), Environmental Quality Incentive Program (EQIP), and other appropriate programs, for the implementation of BMPs that reduce the potential for water pollution due to the presence of karst, such as maintaining setbacks for manure and atrazine applications near springs and sinkholes and establishing and maintaining conservation buffers.

Action 3.B. Provide assistance as resources allow for the cleanup of a dumpsite in a sinkhole or waterway or ravine with a goal of completing one clean up per year.

Objective 4: Gather information and data that enhances the understanding of karst systems in the county.

Action 4.A. Each year, as funding allows, conduct karst studies, such as dye traces, spring monitoring, Decorah shale and geophysical investigations, to delineate springshed boundaries and better understand subsurface conditions and the interconnections between surface and ground water.

Action 4.B. Compile information related to the location and condition of the BP Amoco pipelines in the county and any contingency plans to enact in the event of a leak from the pipeline.

Fertilizer and Pesticide Use

Objective 1: Conduct annual education programs that inform both ag and non-ag fertilizer and pesticide users about BMPs that ensure that negative impacts from fertilizers and pesticides to water resources are reduced.

Action 1.A. As funding and opportunities become available, develop educational activities for the appropriate audiences to promote reduced use of fertilizers and pesticides for settings such as agricultural lands, lawns, public property, gardens, roadsides, golf courses, etc.

Action 1.B. Conduct an annual education campaign emphasizing the recommendation that there be no fall application of anhydrous ammonia.

Action 1.C. Provide assistance to the schools, as requested and as funding allows, to enhance their natural resources curriculum related to proper use of chemicals in the environment.

Action 1.D. Encourage nutrient management research and economic analyses to document the maximum benefits of utilizing manure, soil testing, and manure testing, and publicize these findings in comparison to University of Minnesota recommended rates.

Action 1.E. Provide information to producers and other audiences about the implications of the determination of the common detection of atrazine and metolachlor in ground water by the Common Detection Advisory Committee in 2002.

Objective 2: Monitor surface water and ground water for the presence of nutrients and pesticides.

Action 2.A. Conduct annual pesticide and nutrient monitoring of surface and ground waters in cooperation with the MDA, MPCA, the Upper Iowa River Alliance, the South Branch Root River watershed project, citizen stream monitoring volunteers, and others as opportunities arise.

Action 2.B. Support the establishment of a long-term volunteer nitrate well monitoring network in cooperation with the SE MN Water Resources Board and maintain the network beyond the end of the grant period.

Objective 3: Provide opportunities or referrals for the proper disposal of waste pesticides and fertilizers.

Action 3.A. Negotiate contracts with Winona County to accept waste pesticides and fertilizers from Fillmore County households, farms, and commercial businesses for a minimal cost. Publicize these services to county residents.

Action 3.B. Assist with promoting and staffing the county's annual Household Hazardous Waste collections as an opportunity for county residents to properly dispose of household pesticides.

Objective 4: Assure that applications of pesticides and fertilizers are done at recommended rates.

Action 4.A. Require fertilizer and pesticide use plans for golf courses and other land uses, when appropriate, that require a Conditional Use Permit.

Action 4.B. Provide technical assistance or referrals to ag and non-ag residents to assure proper applications of fertilizers and pesticides.

Feedlots and Manure Management

Objective 1: Implement a county feedlot program which meets the farmers' needs and minimizes or eliminates water pollution hazards from feedlots to protect ground and surface waters.

Action 1.A. Complete a Level III feedlot inventory for the entire county by 2015.

Action 1.B. Annually convene the Feedlot Advisory Group to review the county feedlot program and the feedlot ordinance.

Objective 2: Provide information and educational opportunities annually to raise public awareness about feedlot issues and the related water quality consequences in the associated watersheds.

Action 2.A. Hold annual informational meetings on feedlot-related issues related to the program and its rules, financial and technical programs, current research, or demonstrations of BMPs, such as land application of manure, rotational grazing, hoopouses, composting, dead animal disposal, etc.

Action 2.B. Annually update the educational packet for new and expanding facilities outlining feedlot requirements in the state rules and local ordinance.

Action 2.C. Provide producers with information about overwintering practices at secondary feeding sites to improve soil and water quality.

Objective 3: Provide financial and technical assistance to feedlot operators to assure compliance with all pollution control requirements from feedlots and manure application in priority areas by 2010 and the rest of the county by 2015.

Action 3.A. Make financial and technical assistance available to producers for development of their own nutrient management plans utilizing public and private assistance as needed.

Action 3.B. By 2015, achieve 100% control of all polluted runoff from feedlots and land application of manure by providing technical and financial assistance to producers.

Action 3.C. Leverage state and federal funding to increase the amount of technical and financial assistance available to producers in meeting state and local feedlot rules and regulations.

Implementation Schedule

Priority Concerns/ Objectives	Actions/ Brief Description	Lead Agency(ies)	Est. Cost* In-kind/Cash		Timeline
Soil Erosion and Runoff					
1. Annual education programs	A. Promote cover crops	SWCD, Extension, NRCS, FSA	\$5,000		2006-2015
	B. Communication with state and federal legislators	SWCD, BWSR, BALMM	\$5,000		2006-2015
	C. Pilot project to develop simplified farm plans with "managed set-aside"	SWCD		\$300,000/ 3 years	2010
	D. Safe use and storage of road salt, alternatives	SWCD, Hwy Dept., Twps	\$5,000		2010
	E. School assistance, educational tools	SWCD, Extension	\$10,000	\$10,000	2006-2015
	F. Urban, construction, logging runoff control practices	SWCD, Extension, MPCA, DNR	\$10,000		2006-2015
2. Watershed-based management					
	A. Upper Iowa River Alliance	SWCD, NRCS, DNR	\$20,000		2006-2015
	B. Management strategies for trout stream watersheds	DNR, SWCD, NRCS	\$20,000		2006-2015
	C. Complete S. Branch Root River project	Fillmore Co. Zoning, SWCD, Mower Co., MPCA	\$50,000	\$600,000/ 3 years	2006-2008
	D. Investigate where bridge and culvert replacements can be used for temporary water storage	Hwy Dept., DNR, SWCD, MN DOT	\$5,000		2010
3. Data collection					
	A. Support and expand volunteer monitoring	SWCD, MPCA, UIRA	\$5,000		2006-2015
	B. Data management with GIS	SWCD	\$10,000		2006-2015
	C. Cooperate with state and federal agencies	SWCD, MPCA, DNR, MDA,	\$30,000	\$30,000	2006-2015
4. Local ordinances and permitting					
	A. Review, clarify, and improve enforcement of soil erosion ordinance requirements for erosion control plans	Zoning, SWCD	\$3,000		2006
	B. Review, clarify, and improve enforcement of shoreland and bluffland ordinances	Zoning, SWCD	\$3,000		2008
		SUBTOTAL	\$181,000	\$940,000	
Drinking Water Protection					
1. Annual education programs	A. Promote private well water testing	SWCD, Public Health, MDA	\$15,000	\$5,000	2006-2015
	B. Promote BMPs that protect wells and ground water	SWCD, Public Health, MDH	\$10,000	\$5,000	2006-2015
	C. Assist with Wellhead Protection Plans and DNR Emergency and Conservation Plans	SWCD, MDH, DNR, Cities	\$1,000/ plan		2006-2015
	D. Promote water conservation	SWCD, Cities	\$3,000		2006-2015
	E. County revolving fund for well sealing and replacement	Fillmore Co., SWCD,		\$500,000	2010

Priority Concerns/ Objectives	Actions/ Brief Description	Lead Agency(ies)	Est. Cost* In-kind/Cash		Timeline
	F. Education for health care providers and caregivers	Public Health, SWCD, Zoning	\$5,000		2006,2020,2015
	G. Assist farm fuel tank owners with upgrading tanks	SWCD, Extension	\$5,000	\$10,000	2006-2010
	H. Promote shared wells in subdivisions	Zoning, MDH	\$5,000		2006-2015
2. Maintain local data	A. Maintain CWI information with GIS	SWCD, MGS, MDH	\$5,000		2006-2015
	B. Support ground water monitoring	SWCD, SE MN WRB, MPCA, MDH	\$15,000		2006-2015
		SUBTOTAL	\$64,000	\$520,000	
Human Sewage Treatment					
1. Bring 50% of noncompliant systems into compliance by 2015	A. Implement county-administered and Ag BMP financial assistance programs to encourage compliance	Zoning, SWCD, MPCA	\$20,000	\$500,000	2015
	B. Inspect 100% of newly installed septic systems	Zoning, SWCD	\$20,000		2006-2015
	C. Complete MPCA ISTS Pilot Program	Zoning, SWCD, SE MN Wastewater Initiative	\$10,000/ 2 years	\$120,000	2008
	D. Sewage treatment options for unsewered communities	Zoning, SWCD, SE MN Wastewater Initiative	\$20,000		2015
	E. Amend zoning ordinance to require inspection at point of sale	Zoning, Planning Commission	\$2,000		2007
2. Annual education programs	A. Education for homeowners	Zoning, SE MN Wastewater Initiative, SWCD	\$7,500		2006-2010
	B. Assist with HHW collection	Solid Waste, SWCD	\$2,500	\$100,000	2006-2015
	C. Promote water conservation for extending life of septic system	Zoning, SWCD	\$1,000	\$1,000	2006-2015
	D. Education for lenders and realtors	Zoning, SWCD, SE MN Wastewater Initiative	\$2,000		2006-2010
		SUBTOTAL	\$85,000	\$721,000	
Sinkholes and Karst					
1. Annual education programs	A. Promote efforts that reduce dumping into sinkholes	Zoning, SWCD, Solid Waste	\$5,000		2006-2015
	B. Utilize karst educational materials in schools, etc.	SWCD	\$10,000	\$1,000	2006-2015
2. Enforce existing ordinances	A. Review feedlot permit applications for karst features	Zoning, SWCD	\$20,000		2006-2015
	B. Review definition of construction materials in sinkhole ordinance. Improve enforcement of sinkhole ordinance.	Zoning, DNR, Twps, Solid Waste, SWCD	\$2,000		2006

Priority Concerns/ Objectives	Actions/ Brief Description	Lead Agency(ies)	Est. Cost* In-kind/Cash		Timeline
	C. Review requirements in Decorah Shale Overlay District	Zoning, SWCD	\$2,000		2008
3. Implement practices that reduce pollution potential in karst	A. Provide financial assistance for BMP implementation	SWCD, NRCS	\$10,000	\$50,000	2006-2015
	B. Dumpsite cleanup	Solid Waste, SWCD	\$10,000	\$10,000	2006-2015
4. Gather information and data about karst	A. Conduct karst studies, e.g. dye traces, spring monitoring	SWCD, DNR, U of M, UIRA		\$50,000	2006-2015
	B. Compile information about pipelines/contingency plans	Zoning, SWCD, MPCA	\$3,000		2007
		SUBTOTAL	\$62,000	\$111,000	
Fertilizer and Pesticide Use					
1. Annual education programs	A. Promote reduced ag and non-ag use of fertilizers and pesticides	Extension, SWCD, MDA, MPCA	\$10,000		2006-2015
	B. Promote no fall application of anhydrous ammonia	Extension, SWCD, MDA	\$5,000		2006-2015
	C. Enhance natural resource curriculum for schools	SWCD, Extension	\$5,000	\$5,000	2006-2015
	D. Nutrient management research, demos, test plots	Extension, SWCD	\$10,000	\$20,000	2006-2015
	E. Provide information about common detection implications	MDA, Extension, SWCD	\$3,000		2008
2. Monitor surface and ground water	A. Annual pesticide and nutrient monitoring	MDA, MPCA, UIRA	\$5,000	\$10,000	2006-2015
	B. Support long-term volunteer nitrate well monitoring	SWCD, SE MN WRB, MDH, MDA	\$25,000		2006-2015
3. Proper disposal of waste pesticides	A. Publicize Winona Co. service to collect waste pesticides from Fillmore Co. homes, farms, and businesses	Solid Waste	\$1,000	\$8,000	2006-2015
	B. Assist with HHW collection	Solid Waste, SWCD	\$2,500	\$92,000	2006-2015
4. Commercial applications at agronomic rates	A. Require fertilizer and pesticide plans for appropriate CUPs, such as golf courses	Zoning	\$5,000		2006-2015
	B. Assistance and referrals for nutrient and pesticide management for ag and non-ag residents	SWCD, Extension, NRCS, MDA	\$20,000	\$10,000	
		SUBTOTAL	\$91,500	\$145,000	

Priority Concerns/ Objectives	Actions/ Brief Description	Lead Agency(ies)	Est. Cost* In-kind/Cash		Timeline
Feedlots and Manure Management					
1. Implement county feedlot program	A. Complete Level III inventory by 2015	Zoning, SWCD	\$10,000		2010
	B. Convene Feedlot Advisory Group	Zoning, SWCD	\$5,000		2006-2015
2. Annual education and information	A. Educational events on livestock-related issues	Zoning, Extension, SWCD	\$5,000	\$5,000	2006-2015
	B. Annually update education packet for new and expanding facilities	Zoning	\$5,000		2006-2015
	C. Provide producers with overwintering BMP information	Zoning, SWCD	\$2,000		2006-2015
3. Financial and technical assistance	A. Financial and technical assistance for nutrient management planning	SWCD, NRCS	\$10,000	\$100,000	2006-2015
	B. Financial and technical assistance for feedlot runoff control and land application	SWCD, Zoning, NRCS	\$10,000	\$900,000	2006-2015
	C. Leverage state and federal funding	SWCD, Zoning, NRCS	\$5,000		2006-2015
		SUBTOTAL	\$52,000	\$1,000,500	
		TOTALS	\$535,500	\$3,437,500	

Implementation Schedule Ongoing Activities

Feedlots

The County's feedlot program includes enforcement of Minnesota Rules Chapter 7020 and oversees permitting for new and expanding facilities of up to 1000 AU. Current staffing levels can be maintained as long as state funding through the MPCA Feedlot Base Grant is available to the county and regional technical assistance grants are continued to address emerging needs. This should ensure that program goals laid out in the water plan and in annual feedlot program work plans will be met.

Individual Sewage Treatment Systems

Fillmore County enforces Minnesota Rules Chapter 7080 in the entire county. Any changes to 7080 are adopted by reference in the county's ordinance. All new ISTS are permitted through the Zoning Office. Ag BMP loans are available for upgrading existing systems. Clean Water Partnership loan funds for upgrading existing failing ISTS in the South Branch Root River Watershed Project will be available for three years and possibly longer if continuation funds are approved. There is growing support for a county administered low-interest loan program that would allow pay back of the loans through the property taxes.

Municipal Wastewater Treatment

The MPCA regulates and monitors activities related to municipal treatment facilities. The county has input if expansion or upgrading of a facility is proposed. None of the municipalities have informed the county of plans to upgrade or expand facilities in the next ten years.

Wetland Conservation Act

Fillmore County will continue to administer the Wetland Conservation Act for the entire county except the city of Chatfield, which lies partially in Olmsted County. Delegation for administration of the program will remain with the Fillmore SWCD. The Wetland Preservation Area program continues to be promoted and administered. Currently there are three contracts in the county totaling approximately 30 acres. One pending contract is for 20 acres.

Floodplains and Shorelands

Flooding events in recent years have highlighted the need for floodplain ordinances. The county and cities with ordinances are gradually working to eliminate those structures that are not flood worthy and introduce land uses in the floodplain that are least impacted by floods. The public is coming to accept the need for limits on development in the floodplain. The maps from the Federal Emergency Management Agency appear to be acceptable to all local units of government as a

guide to the areas susceptible to flooding. All unincorporated areas of the county fall under the county's floodplain ordinance. The cities, including Rushford Village, enforce their own floodplain ordinances. The ordinances appear to be adequate in their scope to deal with floodplain issues.

Floods in Spring Valley in 2000 were the worst since 1942. A proposal for a PL566 project in the Spring Valley Creek watershed was developed but not accepted by the federal government after a cost/benefit analysis showed that removal of structures in the floodplain within the city would be more cost-effective than investing in upland practices to reduce peak flows in the stream.

The Fillmore County shoreland ordinance was most recently updated in 1999. The county receives a small grant each year from the MN DNR for administration of the ordinance on all lands in the county within 300 feet landward from the ordinary high water level of all protected watercourses as identified on the Protected Waters and Wetlands map. An annual report is submitted to the DNR about the activities regulated in the shoreland district. Rushford Village currently enforces its own shoreland ordinance. Much of the shoreland district also falls under floodplain regulations which the municipalities also enforce. Soil erosion impacts are addressed in the ordinance, as well as use of fertilizers and pesticides, placement and design of roads and parking areas, water supplies, and sewage treatment, and stormwater management. The section of the ordinance related to Planned Unit Developments (PUDs) also addresses issues associated with campgrounds.

Solid Waste

The County's Solid Waste Management Plan will be the primary mechanism used to address solid waste issues. The plan was updated in 2001. The issues given more attention are on-site disposal (i.e. burn barrel emissions, ash disposal) and illegal dumping. Mechanisms will continue to achieve the source reduction and recycling goals, to keep hazardous waste out of the general waste stream, and to recycle as large a portion of the waste stream as possible. Fillmore County has an integrated solid waste management system that includes: a transfer station, and recycling operations and household hazardous waste collections held twice a year. The broad programs included in the solid waste system include: education, recycling, rural recycling drop-off sheds, a problem materials and Household Hazardous Waste collection program, and source reduction practices. The County discontinued Municipal Solid Waste (MSW) composting and increased the number of recycling categories accepted in the county. Fillmore County is a member of the Southeast Minnesota Recycling Exchange (SEMREX) which provides a regional approach for cooperative marketing of recyclables, materials exchange and for cooperative educational activities.

Fuels and Hazardous Materials Storage and Transportation

Non-commercial farm fuel tanks and tanks that store fuels for residential use are not regulated yet pose a water pollution risk if they leak. Education continues to encourage leak and spill protection measures in other portions of the water plan.

7/20/2005

Transportation of fuels and other hazardous materials through the county presents a threat to water resources if an accident occurs and tanker truck contents are released into the environment. Local fire departments are equipped and trained to address these situations. Regional or statewide hazardous materials teams are called in to help with containment and clean up. Past efforts to improve the response to these emergencies locally have been unsuccessful but will be reactivated if opportunities arise for cooperative efforts with other responsible agencies through wellhead protection or other avenues.

Mercury-Impaired Waters and TMDLs

Actions will not be taken locally to address pollution sources for streams designated as impaired due to mercury contamination. These sources lie outside of the county's jurisdiction and are widespread requiring a statewide or national approach to mercury pollution abatement.

7/20/2005

APPENDIX

FILLMORE COUNTY
COMPREHENSIVE LOCAL
WATER MANAGEMENT PLAN

PRIORITY CONCERNS SCOPING
DOCUMENT

NOVEMBER 2004

PRIORITY CONCERNS SCOPING DOCUMENT

The priority concerns scoping document for the Fillmore County Local Water Management Plan was developed in accordance with the changes to the Comprehensive Local Water Management Act; Statutes: 103B.304 – 103B.355. This scoping document lists the priority concerns the Fillmore County Water Management Task Force has chosen along with a detailed account of how the concerns were identified and selected.

INTRODUCTION

Fillmore County is located in southeastern Minnesota in the southernmost tier of counties along the Iowa border. Only Houston County to the east lies between Fillmore County and the Mississippi River. Mower County borders Fillmore County to the west, and Olmsted and Winona counties are on its northern border. There are 23 townships and 14 cities in Fillmore County in a land area of about 550,000 acres. The Root River drains approximately 491,000 acres, and the Upper Iowa River drains about 59,000 acres.

Fillmore County's landscape is characterized by its karst topography. Karst is a term used to describe the geology of an area underlain by soluble carbonate bedrock, such as the limestone and dolomite found here. Karst features include sinkholes, springs, caves, disappearing streams, and blind valleys. These features are found throughout the county and provide many interconnections between surface water and ground water. Shallow soil cover over much of the county and the prevalence of karst features create an area highly sensitive to ground water contamination from pollution sources at or near the land's surface

The Fillmore County Water Plan Coordinator is responsible for the Local Water Management Plan (LWMP). The original LWMP was adopted in 1990. In 1995 and 2000 the County updated the LWMP. Both updates were approved by the BWSR for five-year increments. The Fillmore SWCD adopted the LWMP as its comprehensive plan in 2001.

LIST OF PRIORITY CONCERNS

- Soil erosion and runoff (Turbidity TMDL/Impaired Waters)
- Drinking water quality
- Human sewage treatment (Fecal Coliform Bacteria TMDL/Impaired Waters)
- Sinkholes and other karst features
- Pesticide and fertilizer use
- Feedlots and livestock waste (Fecal Coliform Bacteria TMDL/Impaired Waters)

PRIORITY CONCERNS IDENTIFICATION

The Fillmore County Local Water Management planning process of addressing priority concerns has included the following steps/actions:

- **July 13, 2004:** The Fillmore County Board of Commissioners signed a resolution to update the Local Water Management Plan.
- **August 5, 2004:** Meeting with Mary Kells and Dave Peterson of BWSR and staff from other counties updating their plans to discuss the revised updating process.
- **August 13, 2004:** Written notice of the decision to update the LWMP was sent to all surrounding counties, all 23 county townships, thirteen incorporated cities, the state review agencies: MN Board of Water and Soil Resources, MN Department of Agriculture, MN Department of Health, MN Department of Natural Resources, MN Environmental Quality Board, MN Pollution Control Agency, and the following ag and conservation groups: MN Milk Producers, Fillmore County ADA, Fillmore County Pork Producers, Fillmore County Farm Bureau, Fillmore County Farmers' Union, Fillmore County Corn Growers Association,

7/20/2005

Fillmore County DHIA, Fillmore County Cattlemen, Hiawatha Chapter Trout Unlimited, Bluff Country Whitetails, MN Project, MN Trout Association, Harmony Wildlife and Habitat Group, Tri-County Pheasants Forever. The notice requested input on the top three priorities related to water management in the county. Townships and cities were asked to submit any water and related land resources plans and official controls to ensure consistency with the LWMP.

- **August – October, 2004:** Citizen Input Surveys distributed through various venues:
 - Fillmore County Libraries
 - Fillmore County Township Association Banquet
 - Root River Ducks Unlimited Banquet
 - Fillmore County Public Health WIC and Blood Pressure Clinics
 - Lanesboro Park Board
 - Mabel Lions Club
 - Fillmore County Master Gardeners
 - Preston Area Ambulance Crew
 - Fillmore SWCD Board of Supervisors
 - Fillmore SWCD website
- **October 13, 2004:** Written notice of a public information meeting was sent to all townships, cities, state review agencies, and ag and conservation groups.
- **October 26, 2004:** Public input meeting was held at 7:30 p.m. at the Fillmore County Office Building Conference Room 108 in Preston, Minnesota.

PRIORITY CONCERNS SELECTION

Following is a list of priority concerns received from state and local governments and the public.

State Agencies' Priority Concerns

MN Pollution Control Agency:

- Impaired Waters/Total Maximum Daily Loads (TMDLs)
 - South Branch Root River impaired for swimming (aquatic recreation) due to fecal coliform bacteria and for aquatic life (fish/ invertebrates) due to turbidity
 - Identify and implement activities to reduce bacteria and sediment in streams
- Erosion and Runoff Control
 - Soil loss from row crop agriculture
 - Watershed-based management; collaborative efforts with other agencies and programs
- Karst Landscape Management
 - BMPs for the protection of susceptible ground water aquifers and spring fed streams
- Trout Streams
 - Protection of riparian areas
 - Protection of springsheds
 - Temperature management (urban stormwater, infiltration, shading)
- Feedlots and Land Application of Manure
 - Prioritize signups for the Open Lot Agreements
 - Implement feedlot fixes
 - Land application tracking (recordkeeping and inspections)
- Wetland management and restoration efforts

7/20/2005

- Conservation Reserve Enhancement Program
- Pesticide and agricultural-related pollutant status and trends

MN Environmental Quality Board:

- Ground water contamination susceptibility – Land use and development in sensitive areas
- TMDL – Impaired Waters – Proximity to JOBZones
- Ground water availability – How to plan for significant water using developments

MN Board of Water Soil Resources:

- Decrease soil erosion and control runoff in targeted areas of the county
 - Ag and urban BMPs that retain water on the landscape
- Manage the surface and ground water quality interconnections in karst geology
 - Identify sensitive water resource areas where land use activities should be managed to protect surface and ground water and where BMPs can be focused
- Provide assistance to rural and urban landowners in adopting comprehensive nutrient management practices on their lands
 - Promote and market conservation programs that encourage nutrient management BMPs

No comments received from MN Department of Natural Resources, MN Department of Health, or MN Department of Agriculture.

Priority Concerns from Local Government and Other Groups

Fillmore County Farm Bureau

- Keep the focus on septic systems so they are not draining into ditches plus city and sewers dumping into streams
 - Action: Big fine
 - Priority areas: Whole county
- That CRP waterways be maintained so water diverts into waterway. If farmer tears out waterway he should not be enrolled again.
 - Priority areas: Whole county

Fillmore County Citizen Survey of Water Resource Management Issues

Township/City where you live (or own land):

Township = 48.7% **City = 43.1%** **unclaimed = 8.2%**
 n = 103 (8 unclaimed) n = 92 (8 unclaimed)

Number of responses from each township and city.

Sumner Twp = 0	Jordan Twp = 2	Chatfield Twp = 4 City = 5	Pilot Mound Twp = 5	Arendahl Twp = 2	Rushford Village = 7 City = 9 Peterson = 3
Spring Valley Twp = 8 City = 7	Fillmore Twp = 3 Wykoff = 1	Fountain Twp = 4 City = 2	Carrolton Twp = 7 Lanesboro = 17	Holt Twp = 5	Norway Twp = 6
Bloomfield Twp = 2	Forestville Twp = 1	Carimona Twp = 7	Preston Twp = 7 City = 8	Amherst Twp = 7	Preble Twp = 3
Beaver Twp = 5	York Twp = 1	Bristol Twp = 1	Harmony Twp = 6 City = 18	Canton Twp = 1 City = 3	Newburg Twp = 9 Mabel = 11

Watershed where you live (or own land):

88.7% Root River 8.7% Upper Iowa River
2.6% unknown

Source of your drinking water:

51.8% Private well 44.1% City/municipal water supply
3.6% unclaimed 0.5% rainwater collection

**1. Number from 1 to 10 these issues that impact water quality in Fillmore County.
(1=most important)**

Issues ranked by the number of responses ranking the issue as #1
n=129 (Total of 195 surveys less 66 for not following directions = 129)

Rank

1	Soil erosion and runoff (23.3%) n=30
2	Drinking water quality and well construction (23.3%) n=30
3	Sinkholes and other karst features (16.3%) n=21
4	Pesticide and fertilizer use (14.0%) n=18
5	Human sewage (7.8%) n=10 Comment: City's
6	Livestock waste (7.0%) n=9
7	Protection of areas most sensitive to pollution (5.4%) n=7
8	Other (1.6%) n=2 1. Educating people in the area of water quality 2. Tire burning plant nothing but destruction of everything
9	Solid waste (0.8%) n=1
10	Fuels and hazardous materials storage and transportation (0.8%) n=1

Other comments:

- Runoff from chemicals spread on streets and highways during winter
- Tire burning plant!
- Farmers not watched for erosion
- [#10] probably would be ranked higher; people's knowledge of how water quality is effected by things they do
- Spraying of roadsides
- Prevent polluters like tire burning proposal
- Storm sewers that go untreated to protected waters.
- Urban lawn chemical applications
- Industrial use of water supply
- Education on the effects of air pollutants on ground water.
- Tire burning plant/air pollution
- Tire burning plant/ethanol
- Runoff from hog set ups that move contaminants into our sinkholes
- Public apathy
- Keep trees out of the streams
- Excessive & unreasonable regulations that cause more problems than they solve!!
- Land application of manure – overapplication
- Dumping of hard to dispose items

2. Under each issue, check two items you feel are the greatest priorities for you and/or Fillmore County.

Issues are ranked in order of the percentage that were checked.

n = 189 (Total of 195 surveys less 6 removed for not following directions.)

ISSUE: Soil erosion and runoff

54.5% From agricultural fields

46.0% Urban runoff from impervious surfaces (contains auto fluids, lawn chemicals, road salt, etc.)

45.0% Runoff into sinkholes and stream sinks

21.7% Extremely high or low flows in rivers, streams and springs

12.2% Eroding streambanks

11.1% From construction sites

ISSUE: Drinking water quality and well construction

45.0% Need for preventing contamination of public water supplies (city and other public wells)

40.2% Coliform bacteria in wells that make the water unsafe for drinking

35.4% Nitrate-nitrogen in wells over the drinking water standard of 10 parts per million

29.1% Need for testing of private wells for contamination

25.4% Abandoned wells that funnel contaminants into the aquifer

Comment: Steel well casing/rusty water should use stainless

ISSUE: Sinkholes and other karst features

73.0% Dumping of garbage, dead animals, yard waste, and other pollutants into sinkholes

Comment: (hope this is not happening!)

56.6% Contaminants in runoff into sinkholes

43.4% Contaminants located in areas that provide water to cold water springs/streams

ISSUE: Pesticide and fertilizer use

49.2% Over application of agricultural chemicals

41.8% Atrazine and other pesticides in surface water and ground water

Comment: from 30 years ago

33.3% Over application of lawn and garden chemicals

31.7% Backflow of chemicals into wells used for ag chemical mixing operations

22.2% Fall application of anhydrous ammonia

ISSUE: Human sewage

59.3% Malfunctioning septic systems

Comment: outdated, tiled to ditch

58.2% Poor operation and maintenance of septic systems by homeowners

45.5% Exceeding pollutant limitations by city wastewater plants

ISSUE: Livestock waste

58.2% Runoff from feedlots

- 40.7% Dead animal disposal
- 40.2% Runoff from manured fields
- 34.9% Over application of manure

ISSUE: Protection of areas most sensitive to pollution

- 57.7% Contaminated runoff into sinkholes and stream sinks
- 36.0% Loss of wetlands, which store and filter water
- 26.5% Need to use natural resource information in land use decision-making
- 21.7% Development or damage in shoreland, floodplain, or riparian (streamside) areas
- 15.9% Destruction of unique and rare plant and animal communities
- 9.5% Development on or destruction of vegetation over the Decorah shale
Comment: drain tile to streams from agriculture land

ISSUE: Solid waste Comment: No big problem here.

- 67.2% Improper disposal of household hazardous waste
- 63.0% Poor recycling practices by homeowners and businesses
Comment: and towns
- 24.3% Lack of rural garbage pick-up
- 15.3% Backyard burn barrels that release dioxin into the air

ISSUE: Fuels and hazardous materials storage and transportation

- 57.1% Presence of old underground storage tanks which usually leak after 20-30 years
- 46.6% Need for knowledge of ground water pathways in the event of a spill
- 41.8% Need for secondary containment for tanks storing fuels or hazardous materials
Comment: hazardous materials
Comment: on tanks over 500 gal.
- 19.6% Lack of automatic shutoff nozzles and overfill protection on farm fuel barrels
Comment: Don't need

Additional Comments:

- Drains into sinkholes
- Canton seems an ok town
- Help keep our water clean so we can drink it without ill effects.
- Need for individual common sense to conserve for future generations. God's creation was "good" don't destroy it.
- Lanesboro is doing very well.
- Need to prevent polluters like proposed tire burner.
- How do we get more people to become more responsible for clean water and how to keep it that way.
- Tire burning facility is unnecessary chance to take
- We need more grassland pastures and hay not corn and soybeans.
- Use of common sense better than anything; no one is out to pollute water supply

October 26, 2004 Public Information Meeting

There were 15 people in attendance at the public information meeting. Twelve participated in the process of providing input for setting priority concerns. Of the ten issues outlined on the citizen survey forms, the meeting participants were asked to rank the top four issues. These rankings were used to group the participants for reviewing the rankings of concerns under each issue. Each group could agree with the ranking results from the citizen surveys or re-rank the issues by consensus with their group. They also listed implementation strategies that would be most effective in addressing the issue. This was done for each of the top four priorities that they ranked.

The issues receiving #1 rankings were as follows:

Soil erosion and runoff	(25%) 3 out of 12 #1 rankings	(4 also gave it a #2 ranking)
Drinking water quality	(25%) 3 out of 12 #1 rankings	(2 also gave it a #2 ranking)
Human sewage	(25%) 3 out of 12 #1 rankings	(0 gave it a #2 ranking)
Sinkholes/karst	(17%) 2 out of 12 #1 rankings	
Pesticide/fertilizer use	(8%) 1 out of 12 #1 rankings	
	100%	

The issues that were among the top four priorities were:

Soil erosion and runoff	(21%) 10 out of 48 votes	(3 gave it a #1 ranking)
Livestock waste	(21%) 10 out of 48 votes	(0 gave it a #1 ranking)
Pesticide/fertilizer use	(15%) 7 out of 48 votes	
Drinking water quality	(13%) 6 out of 48 votes	(3-#1rankings and 2-#2 rankings)
Human sewage	(12%) 6 out of 48 votes	(3 - #1 rankings and 0 - #2 rankings)
Sinkholes/karst	(10%) 5 out of 48 votes	
Protection of sensitive areas	(8%) 4 out of 48 votes	
	100%	

PRIORITY CONCERNS NOT ADDRESSED BY THE PLAN

Staff limitations and budget cuts make it necessary to focus on fewer issues over the next five to ten years of implementing the LWMP. Fortunately, Best Management Practices (BMPs) that address one priority concern often have cross over benefits into other areas. For example, BMPs that reduce soil erosion and runoff also reduce transport of pollutants such as bacteria and nitrates into waterways and increase water infiltration benefiting ground water recharge and base flow in streams and springs. This, in turn, helps to address Impaired Waters and TMDLs for the water contaminants of concern affecting those segments of the Root River that have been listed on the 2004 303(d) Impaired Waters list.

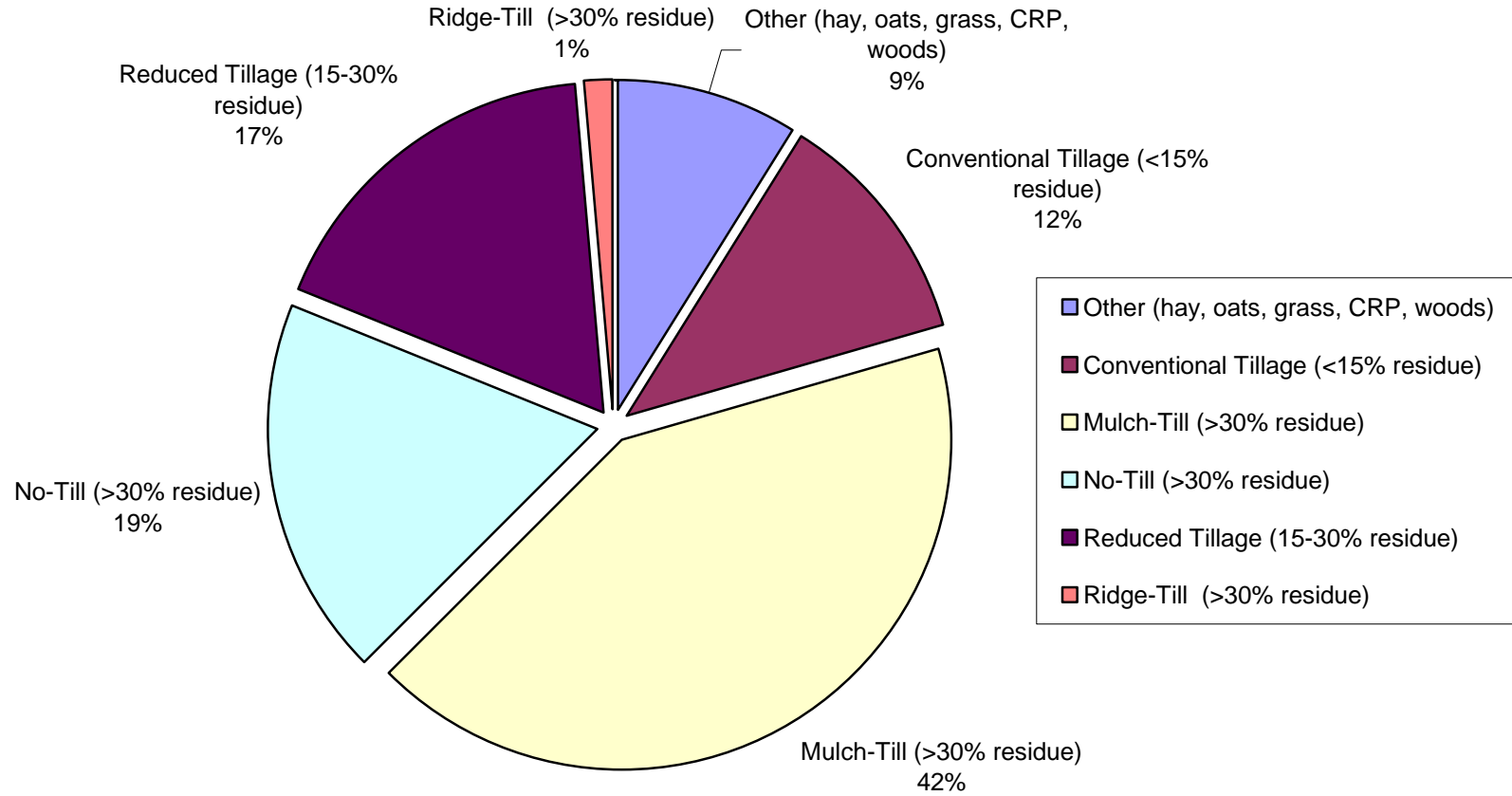
Although not among the priority concerns that will benefit from targeted funding or new initiatives over the next decade, protection of areas sensitive to pollution, solid waste, and fuels and hazardous materials will not be ignored. Many ongoing and existing county programs and/or ordinances will continue to be implemented or enforced for water resource protection. For example, ordinances protecting the Decorah shale, the shoreland zone, and floodplains are enforced on an ongoing basis. Administration of the Wetland Conservation Act and enrollment of

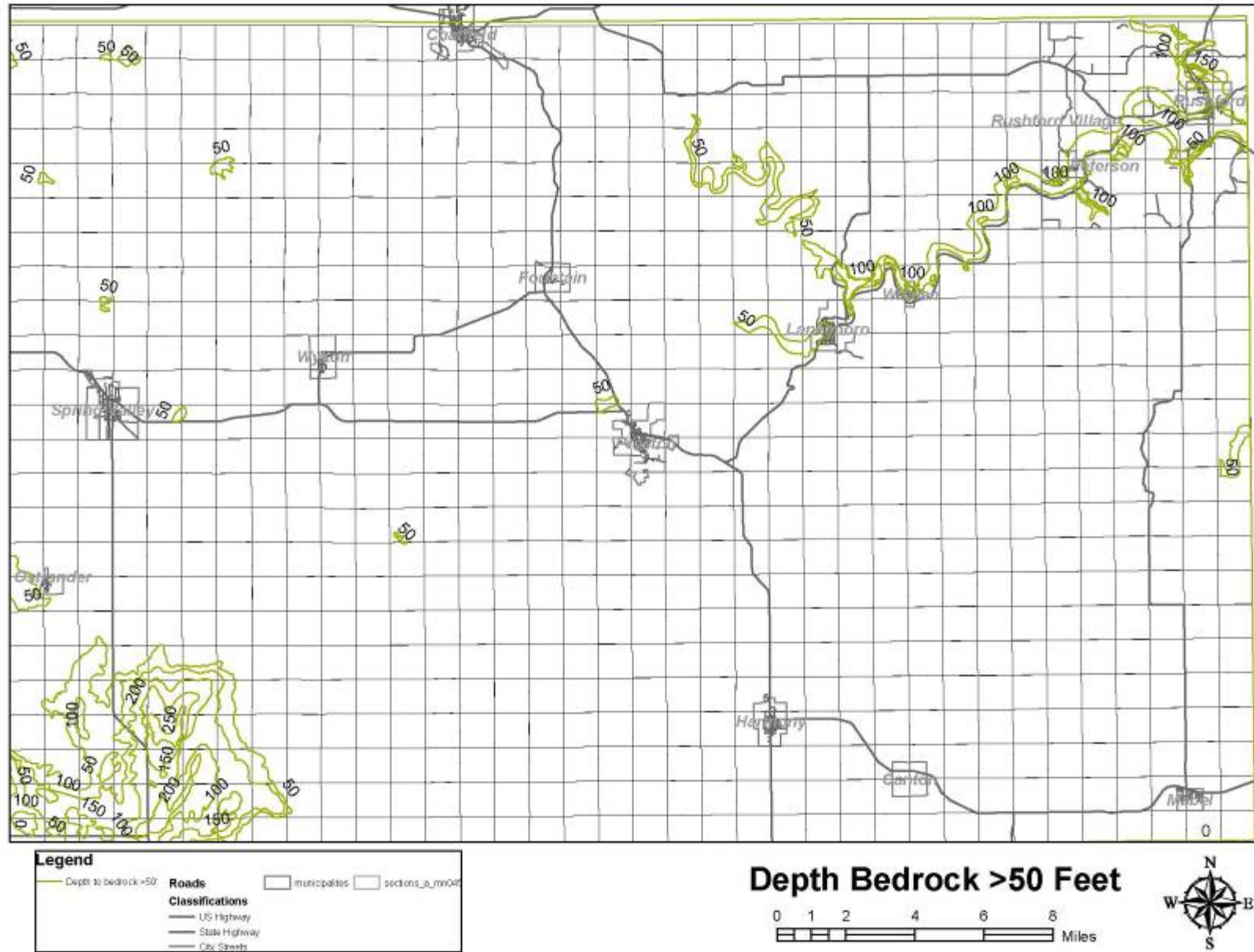
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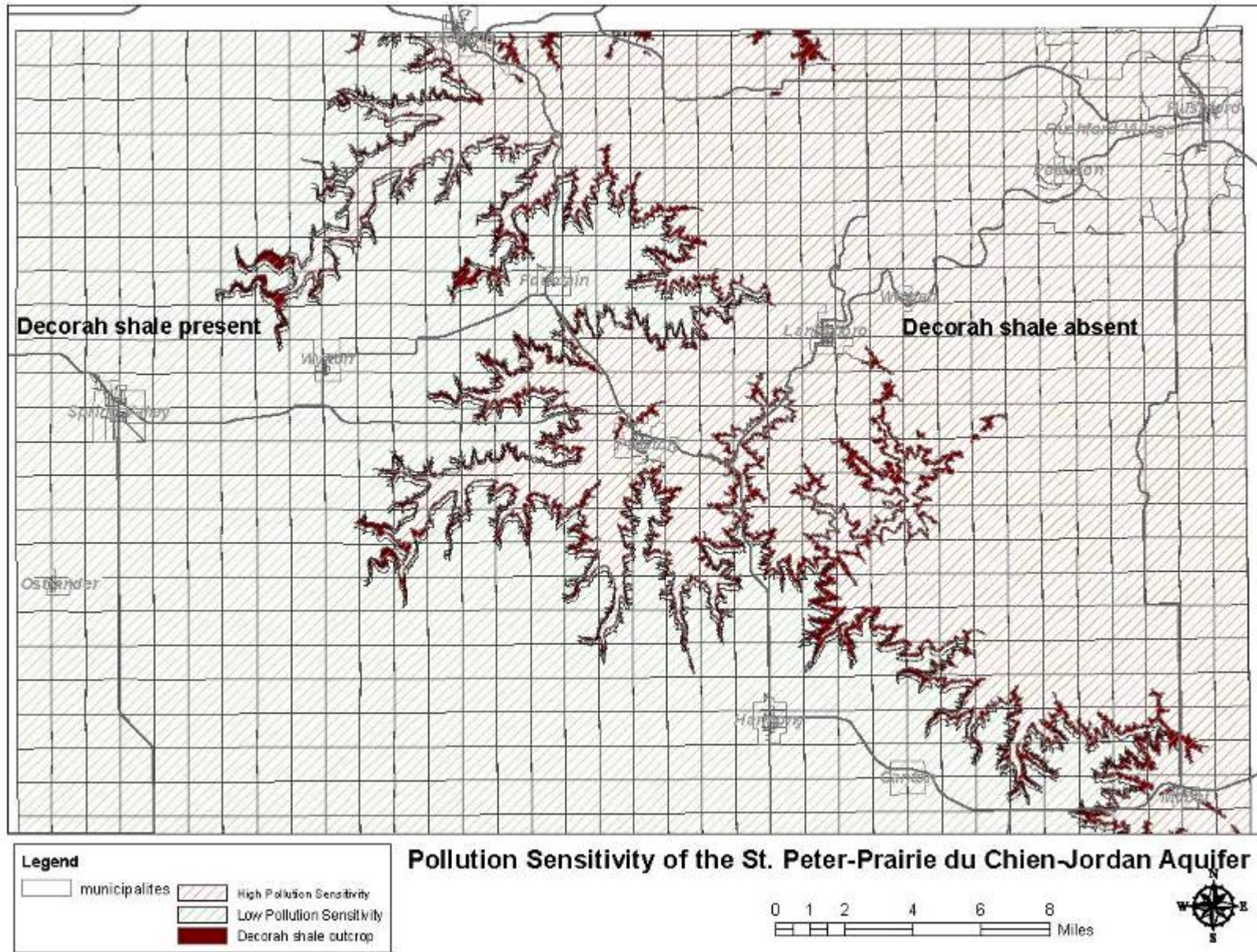
acres into the Wetland Preservation Area program will continue as before. The Fillmore County Solid Waste Management Plan guides solid waste-related activities and strategies. The county has adopted both the ISTS and feedlot rules and enforces both. Education and information will continue to periodically address less pressing water management issues.

The proposed tire burning energy facility in Preston was mentioned in many comments. As a potential source of mercury contamination in areas downwind of the facility, and with the recent listing of segments of the Middle Branch of the Root River on the 2004 303(d) Impaired Waters list due to mercury contamination, the question emerges about the county's role in dealing with sources of mercury in our waters. The sources impacting the Middle Branch of the Root lie outside the county's jurisdiction. A source within the county, such as the tire plant, has effects that can go well beyond county or state boundaries. As stated in the priority concerns letter from the MPCA, it appears that the only way to tackle this issue is through statewide, or even interstate or international, efforts which take a comprehensive view of mercury sources and impacts without the impediment of political boundaries.

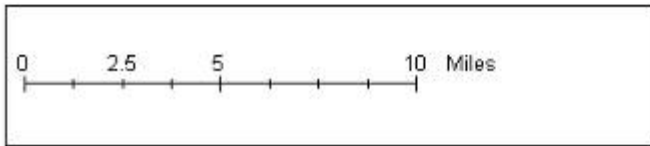
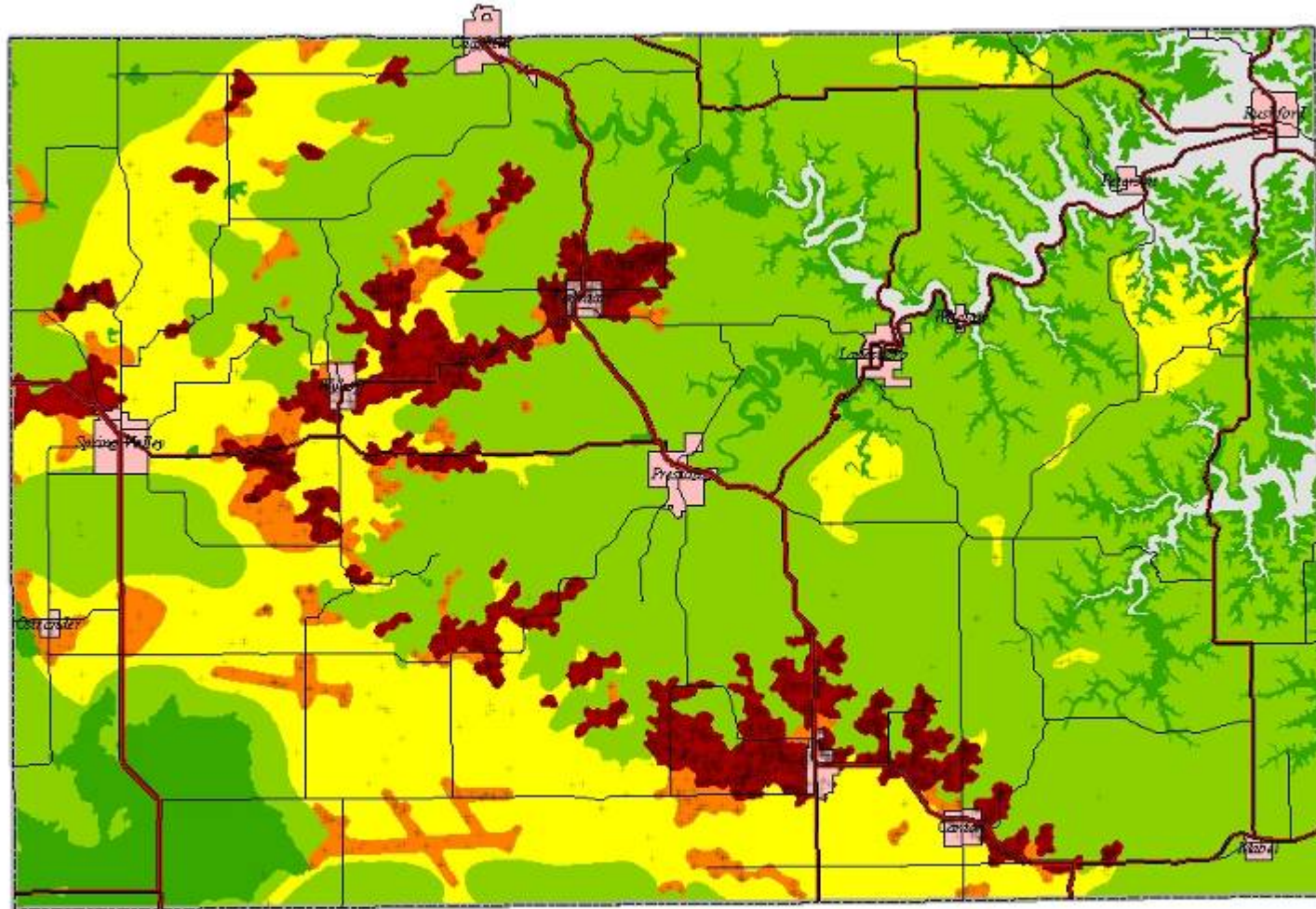
South Branch Root River Watershed Project Area 2005



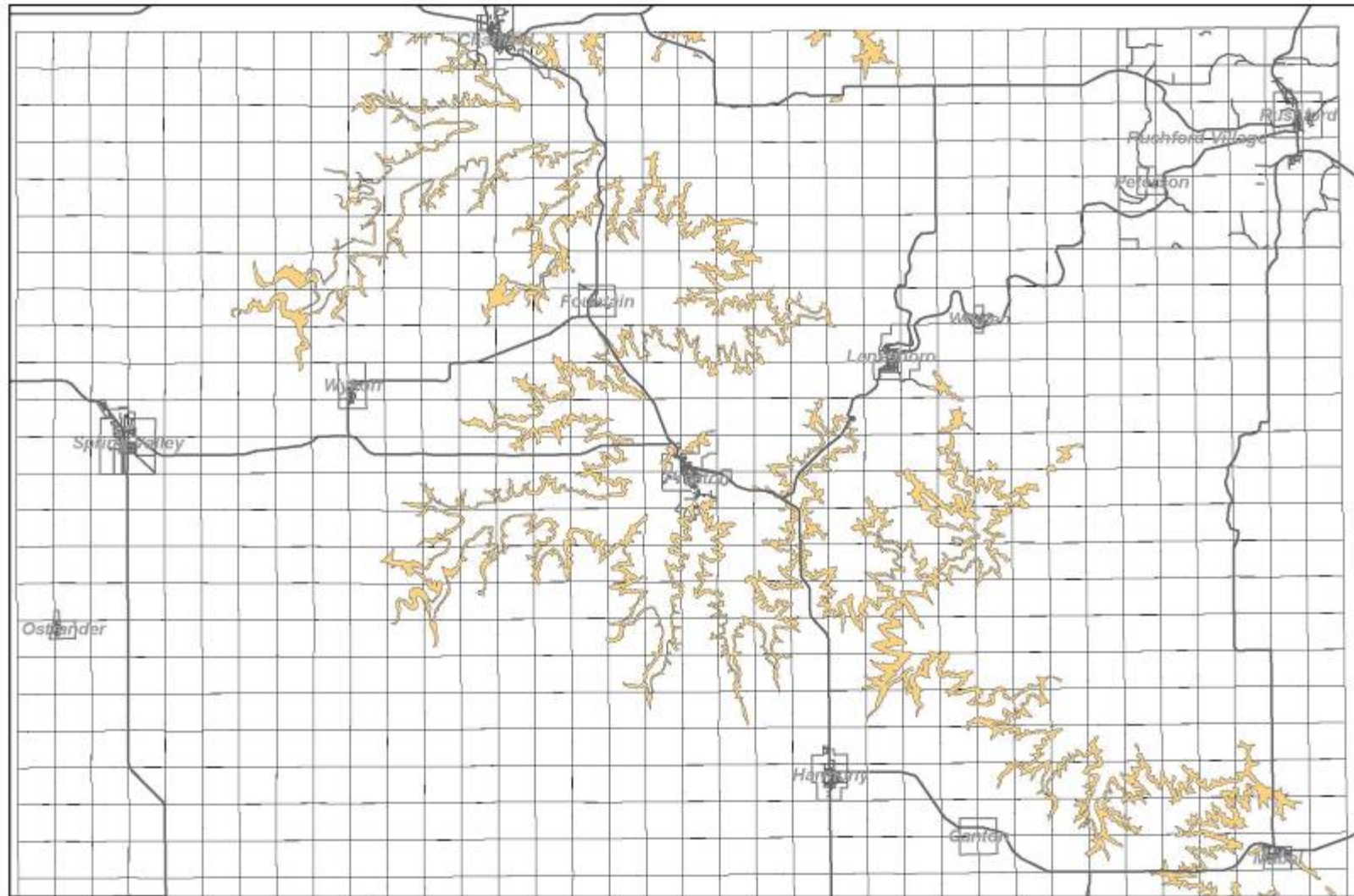






Sinkhole Probability of Fillmore County



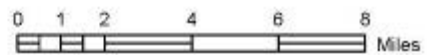
Legend	
• Sinkholes	Sinkhole Probability
County Line	None
	Very Low
	Low
	Moderate
	High
	Sinkhole Plains
	Roads
	US Highway
	State Highway
	CSAH



Legend

-  municipalites
-  Decorah Shale 1st bedrock

Decorah Shale



Atrazine Calendar Year 2004

