Houston County

Comprehensive Water Plan

2007 – 2017

RESOLUTION NO. 08-7

Adoption and Implementation
After BWSR Approval

WHEREAS, the Houston County Board of Commissioners has been notified by the Minnesota Board of Water and Soil Resources that the Houston County Comprehensive Local Water Management Plan has been approved according to Minnesota Statutes Chapter 103B.301:

NOW, THEREFORE BE IT RESOLVED, the Houston County Board Commissioners hereby adopts and will begin implementation of its approved comprehensive water plan.

BE IT FURTHER RESOLVED, after the adoption of the local comprehensive water management plan, the Houston County Board shall amend existing water and related land resources plans and official controls as necessary to conform them to the applicable and approved comprehensive water plan.

BE IT FURTHER RESOLVED, after the adoption of the local comprehensive water management plan, Houston County shall notify local units of government within the County of the adoption of the plan or amendments to the plan. The local units of government are required to submit existing water and related land resources plans and official controls within 90 days to the County Board for review.

BE IT FURTHER RESOLVED, Within 180 days, the Houston County Board shall review the submitted plans and official controls and identify any inconsistencies between the local plans and official controls, and local comprehensive water management plan. The Houston County Board shall specify applicable and necessary measures to bring the local plans and official controls into conformance with the local comprehensive water management plan.

BE IT FURTHER RESOLVED, if a local unit of government disagrees with any changes to its plan, the local unit has 60 days after receiving the county's recommendations to appeal the recommendations to the Board of Water and Soil Resources.

BE IT FURTHER RESOLVED, after receiving the recommendations of the Houston County Board, or a resolution of an appeal, a local unit of government has 180 days to initiate revisions to its plan or official controls. The new or revised plans and official controls must be submitted to the Houston County Board for review and recommendations.

*****CERTIFICATION*****

STATE OF MINNESOTA

COUNTY OF HOUSTON

I, A. Peter Johnson, do hereby certify that the above is a true and correct copy of a resolution adopted by the Houston County Board of Commissioners at a special session dated January 8, 2008.

WITNESS my hand and the seal of my office this 8th day of January, 2008.

(SEAL)

A. Peter Johnson

A. Peter Johnson, County Auditor

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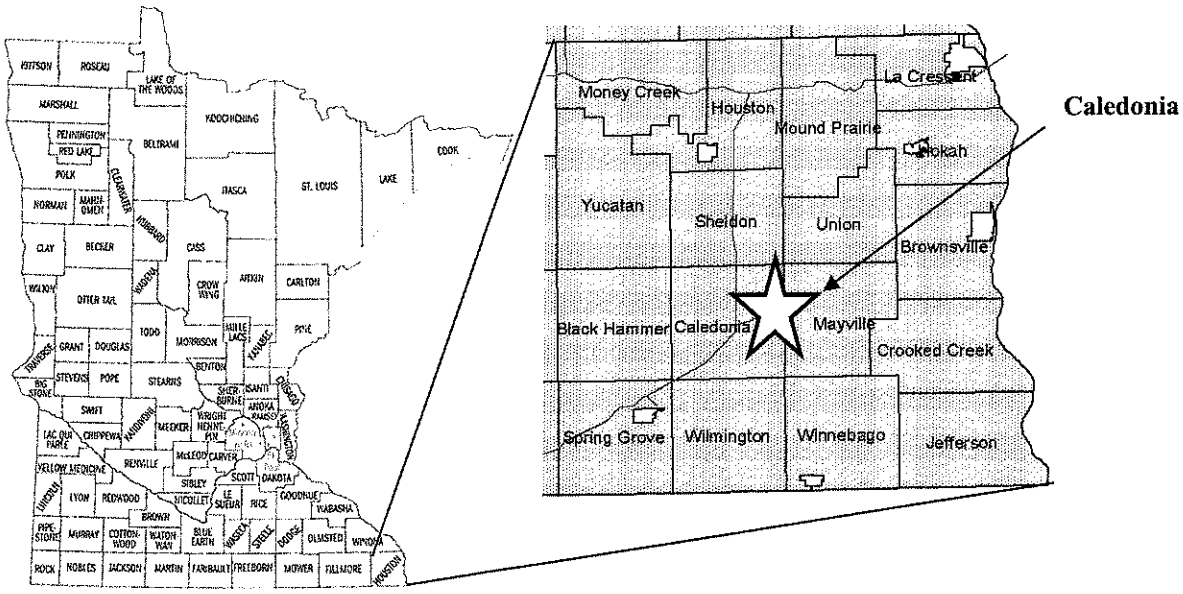
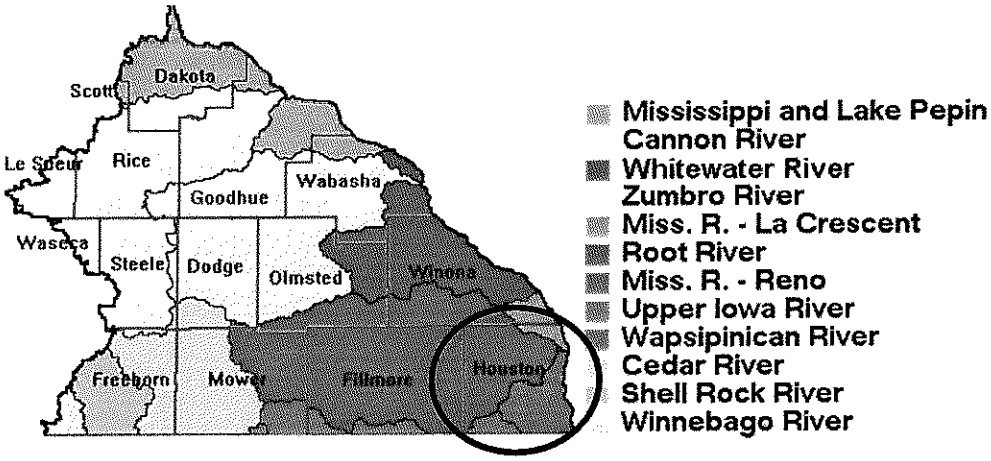
Introduction

Houston County lies in the extreme southeastern corner of Minnesota bounded by the Mississippi River on the east, Iowa on the south, Fillmore County on the west and Winona County on the north. The County consists of seventeen townships and four major watersheds.



The Root River bisects Houston County with a watershed that comprises about 60% of its land area. Two smaller watersheds along the eastern side of the county drain directly to the Mississippi River. The fourth watershed covers the southern area of the county, draining to the Upper Iowa River. The topography of the district is very irregular with elevation extremes of over 600 feet. Many of the hilltops are over 400 feet above the flood plains and are within a fraction of a mile in distance.



Houston County Commissioners

Larry Graf – 1st District
Larry Connery – 2nd District
Ann Thompson – 3rd District
Dave Corcoran – 4th District
Thomas Bjerke – 5th District

Waterplan Advisory Board

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Marcus Evans
Rick Frank
Gary Larson
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James Solum
Ann Thompson

Root River SWCD Board

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Executive Summary

The purpose of this plan is to identify the primary water resource concerns of local citizens and outline strategies to address those concerns through sound public policy, coordinating implementation with cooperating agencies and partners. These local citizen concerns are referred to as "Priority Concerns."

The Priority Concerns identified for Houston County are:

Goal 1: Protect ground water in order to maintain an adequate supply of safe drinking water for current and future generations.

Goal 2: Improve surface water quality in rivers and streams in Houston County.

Goal 3: Manage storm water runoff to minimize risk to human life, property and the environment.

Goal 4: Optimize recreational uses of water resources.

Goal 5: Review of local and regional plans and ordinances for compliance/compatibility.

An in-depth discussion of these concerns are outlined on the attached Priority Concerns Scoping Document. Houston County Water Plan was originally adopted in March 1990 and updated in 1996 and 2000. The current plan expires on December 30, 2007.

We have provided an analysis of the watershed units as well as groundwater systems. Because of the complex interconnectivity of surface and groundwater in our Karst topography along with similarities in land use and physical characteristics, Houston County has addressed resource concerns across watershed boundaries.

Five major goals identified in the priority scoping document will be addressed through focus on efforts to reduce negative impacts of changes in agriculture and land use and implement cost effective measures to prevent potential degradation of resources through new and/or innovative applications of technology. A combined approach of information and education, technical and financial assistance, together with regulations will be utilized. An estimated $357,500 cash along with in-kind services will be expended from 2007-2012.

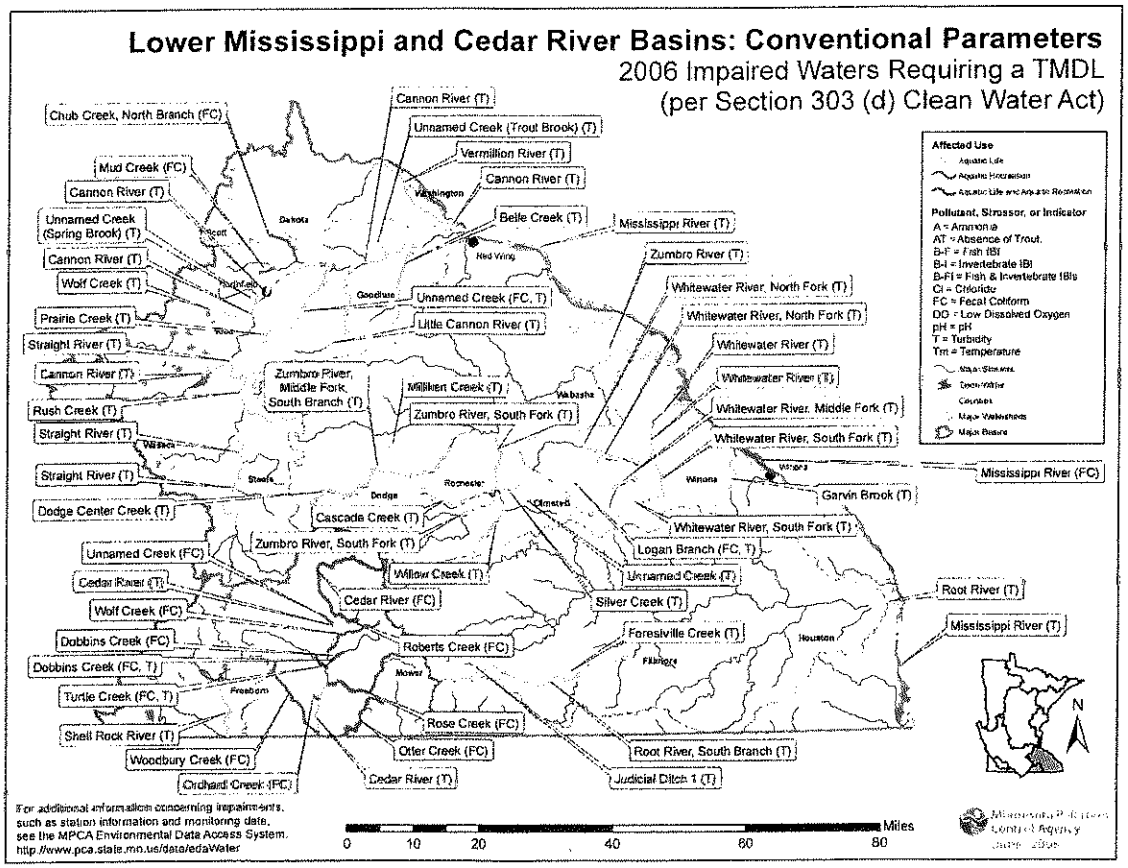
Every effort has been made to maintain consistency with other local water management plans and to coordinate efforts with local, state, and federal plans and contacts. The plan covers the policies, goals, and effectiveness which the county intends to follow over the coming ten years (2007 – 2017).

Houston County Watersheds

Root River Watershed

Houston County is on the lower end of the Root River which was dredged and realigned into Judicial Ditch #1 in the early 1900's. While the channel is now treated as a stream, much of the flood plain and channel have been impacted by this historic realignment.

Diking and flooding are the predominant water issue on this segment of the Root River. Portions of the stream are listed on the MPCA's impaired waters lists. MPCA has developed a Total Maximum Density Load (TMDL) implementation plan for fecal coliform on the Root River. A TMDL plan for turbidity is scheduled.



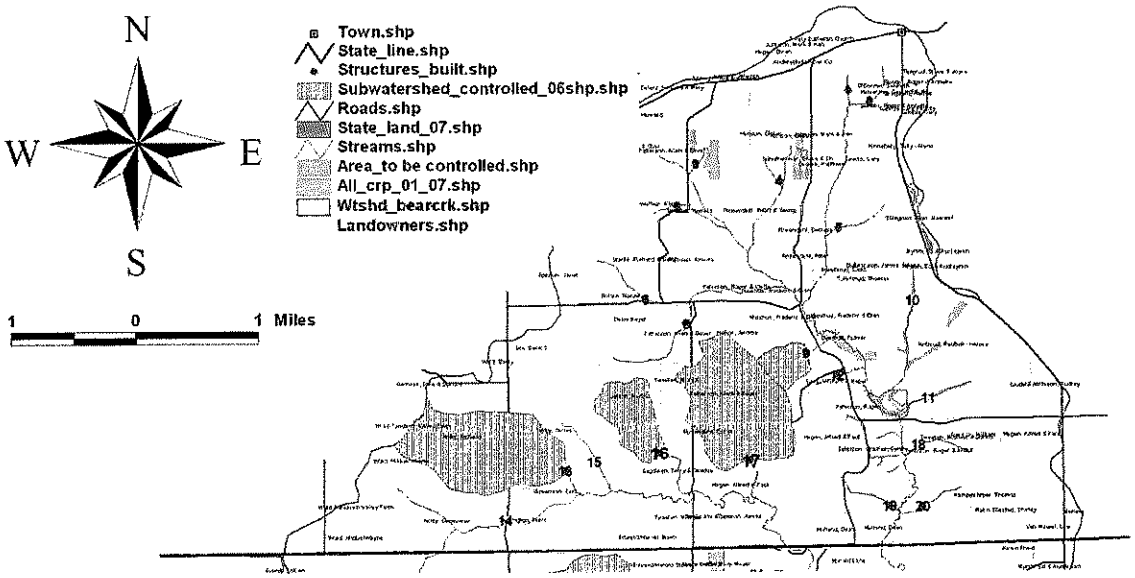
2006 Impaired Waters Southeast Minnesota

Because much of the drainage area of the Root River is outside Houston County's jurisdiction, we are heavily dependant on adjoining counties for treatment of this watershed.

Upper Iowa Watershed

Unlike the Root, Houston County controls the very upper portion of the Upper Iowa Watershed. The Bear Creek portion of the Upper Iowa Watershed is currently under a PL-566 Small Watershed Assistance plan to treat flooding and water quality. To date, $198,686 has been spent within the watershed.

Flatter topography and more intense agriculture characterize this watershed. Houston County's portion of the geologic formation, the Decorah Shale is primarily within this watershed. Springs and side hill seeps distinguish an area called the "Decorah Edge", identified throughout Southeast Minnesota as a sensitive ground water area.



Bear Creek Projects Implemented To Date

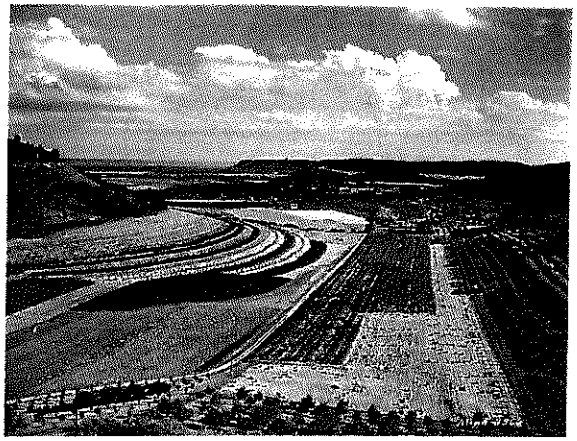
Upper Mississippi – Reno Watershed

The Upper Mississippi-Reno Watershed can be divided further into two sub-watersheds; the Crooked Creek Watershed and the Winnebago Watershed. The Crooked Creek Watershed was treated by a PL-566 Small Watershed Assistance plan in the mid 1960's. *(See Attachment #1 - Crooked Creek Watershed)*. Flooding in this sub-watershed has been effectively controlled. Repair and maintenance of these aging structures is a looming concern of the County. The Winnebago Watershed, unlike the Crooked Creek, does experience severe flash flooding. A PL-566 application was denied in 2005 because of cost-benefit ratio. Houston County continues to seek methods of addressing this issue.

Upper Mississippi – La Crescent Watershed

More than other watersheds in the county, the Upper Mississippi – La Crescent Watershed is experiencing rapid changes in agriculture and land use affecting our water resources. The township has struggled with zoning issues to control development and manage water resource protection.

Non-farm rural residential growth in the area is under separate zoning governed by the township. Land use changes away from agriculture to rural non-farm dwellings have increased; adding potential issues with individual onsite sewage treatment systems, building site erosion control, and rural water supplies.



This photo demonstrates the rapid growth in the La Crescent Area.

Priority Concerns

An assessment of the Priority Concerns impacting water in Houston County has identified major issues in erosion control and sedimentation, surface water contamination from confined livestock, sewage treatment and disposal, home site development, flood control, human drinking supply, and recreational uses. Other issues considered were State mandated requirements including wetlands and protections zones including shore lands, calcareous fens, and bluff lands. These priority concerns fall into five major issues as identified in the Priority Concerns Scoping Document. *(See Attachment #2 – Priority Concerns Scoping Document)*.

An in depth analysis of these issues reveal a complex interconnectivity compounded by our Karst geology. Surface water flows readily into ground water through shallow soils over fractured bedrock. Springs discharge ground water into streams miles away, often crossing surficial divides, rendering the traditional watershed approach ineffective, in many cases. For this reason, while differences in watersheds have been considered and are outlined below, many of the issues are addressed on a county wide basis.
(See Attachments #3 - #5).

Likewise, many of the issues identified transcend the scope of a single resource concern, affecting surface and groundwater surface water quality and quantity and so on. Because of these factors, Houston County has provided an assessment of the priority resource concerns on an issue by issue basis, rather than a resource by resource basis.

Issue 1: Changes in Agriculture and Affects on Water Resources

Issue 2: Sensitivity of the Karst Topography and Changes to Land Use and Development

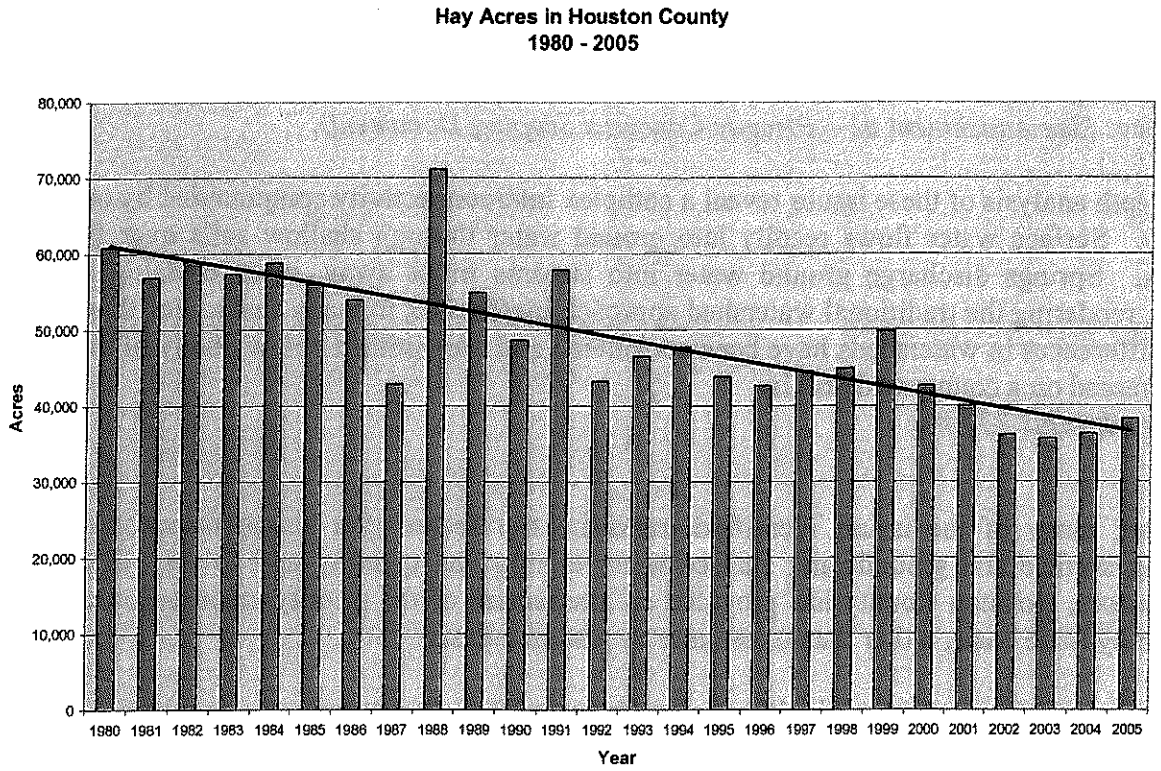
Issue 3: Recreational Uses of Water and Impact to the Environment

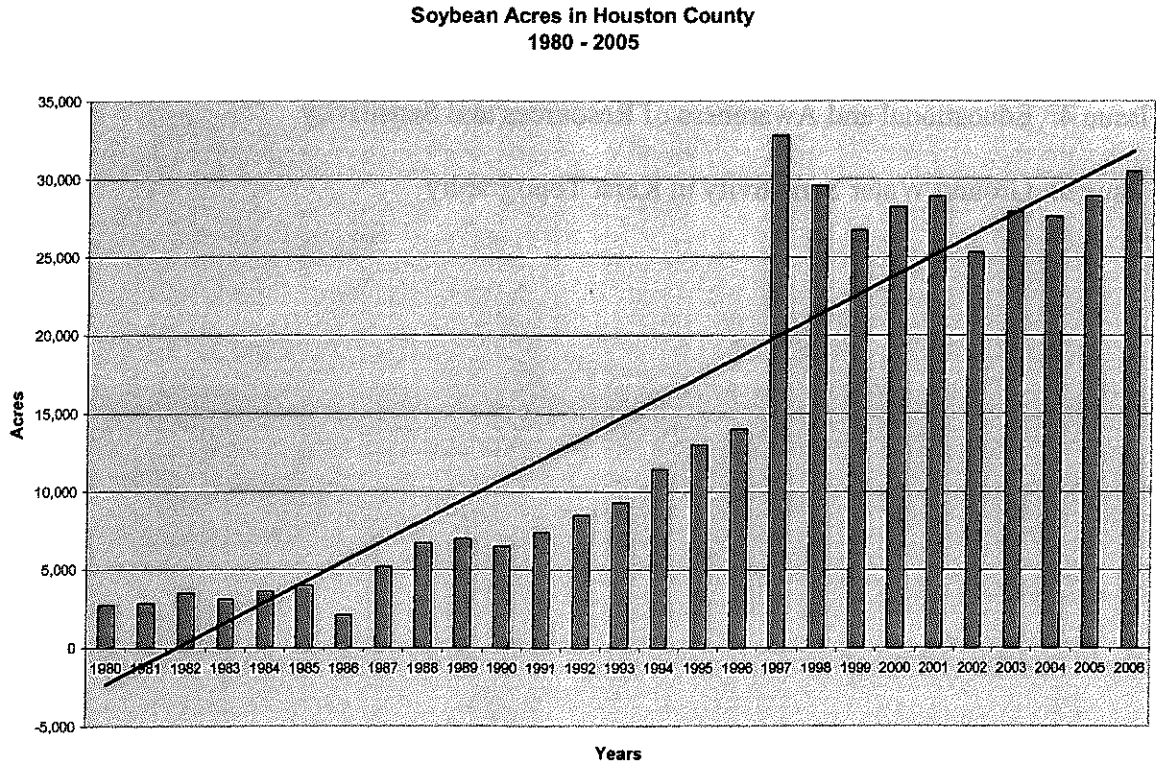
Issue 4: Educational and Awareness of Resources and Sensitivity

Issue 5: Ground Water Sensitivity in Karst Topography

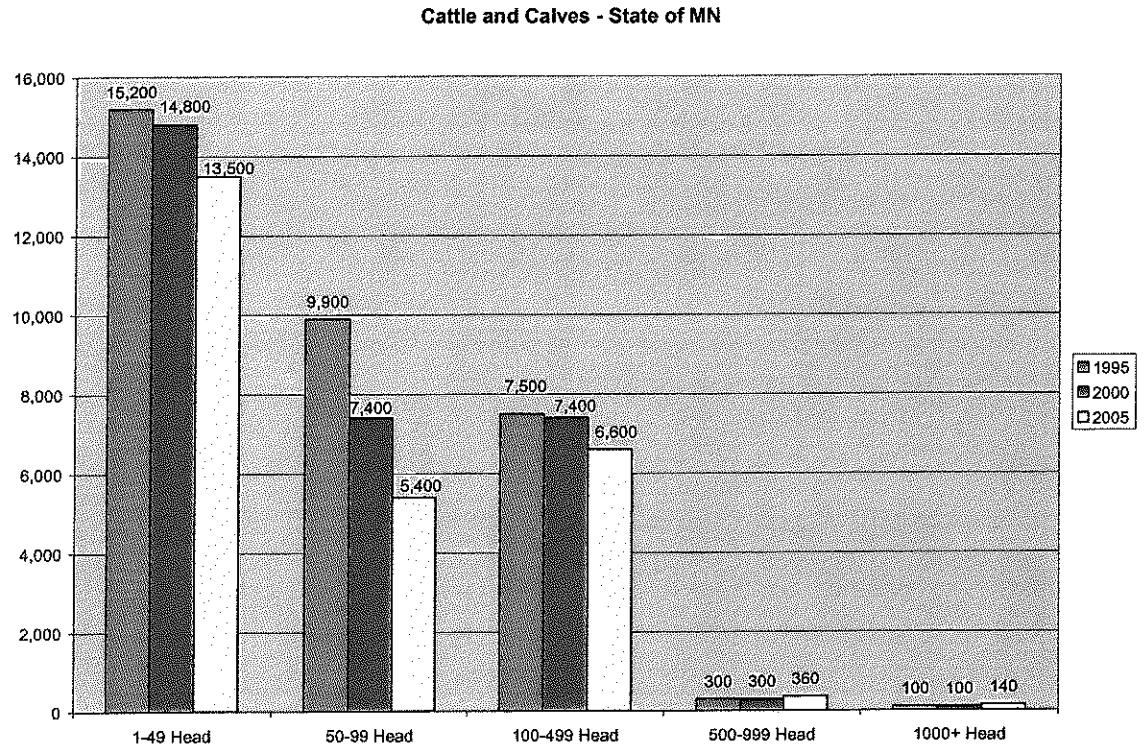
Issue 1: Changes in Agriculture and Affects on Water Resources:

Changes in agriculture and public policy have resulted in a shift away from small scale animal agriculture, toward fewer larger scale operations. Also, a dramatic shift from hay land to soybeans has accured.





Concentration of livestock in larger operations has created an increase in demand for engineering and technical assistance for storage, handling and application of livestock waste. Loss of hay land has emphasized the need for erosion control measures to replace contour strip farming, which was once a prominent feature of Houston County's landscape. Conservation practices such as no till farming, terraces and buffer strips, grade stabilization structures, water and sediment control basins, and push-up ponds while effective may not fully mitigate the affects of this change.



These changes have the potential for a profound negative impact on both surface water quality and water quantity, particularly due to the vulnerability of our soils to erosion and rapid runoff.

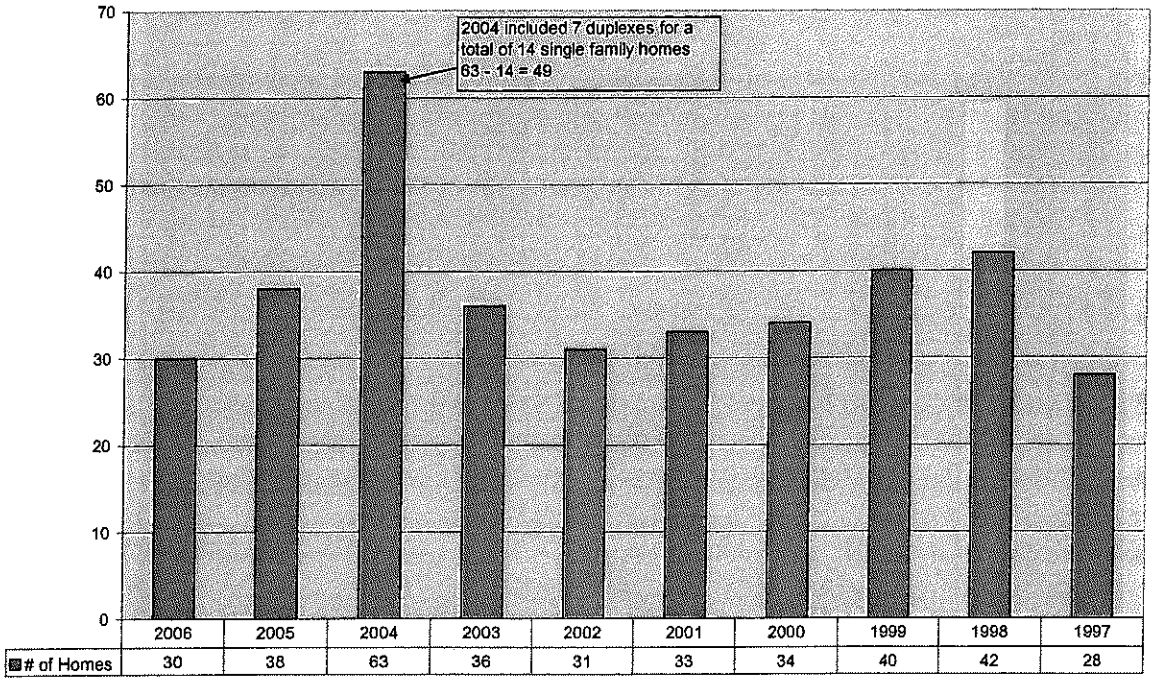
Houston County recognizes these changes in agriculture and the affects on our water resources. We also recognize the socioeconomic factors driving these changes extend far beyond the scope of county jurisdiction. Changes in U.S. Farm Bill, along with state laws creating economic disincentives to livestock producers in Minnesota may be contributing factors to the loss of animal agriculture.

Land use changes away from agriculture to rural non-farm dwellings have increased, adding potential issues with individual onsite sewage treatment systems, building site erosion control, and rural water supplies.

Issue 2: Impact of Development on the Sensitive Karst Topography

The current rate of new housing in the rural areas of Houston County has stayed fairly constant in the last 10 years (see graph). Even though population growth in the rural areas of the county has been constant, there remains a strong need for practices to reduce the potential erosion on new building sites. New building sites located on the Karst topography of Houston County provide the homeowner an opportunity for unique scenery and breathtaking views but, at the same time, require best management practices in reducing soil erosion.

Rural Residential Housing in Houston County



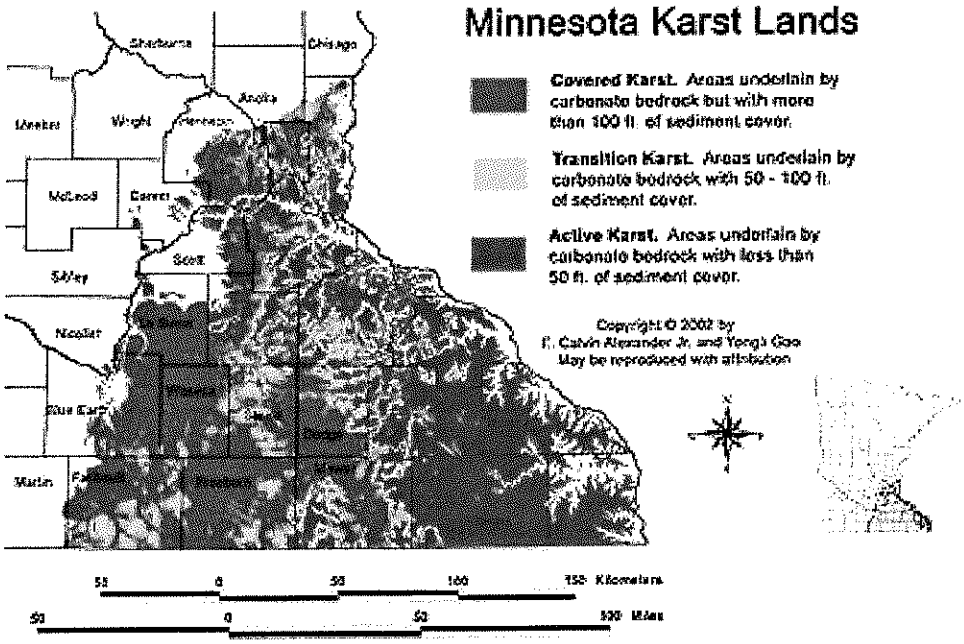
	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
# of Homes	30	38	63	36	31	33	34	40	42	28

Local zoning ordinances limit housing to areas of reasonable slope and take into consideration setback distances from shore land and bluff land areas. These ordinances were adopted to protect vulnerable areas of the county from housing development. Through the zoning review process these vulnerable areas are eliminated as potential building sites early on before they get started.

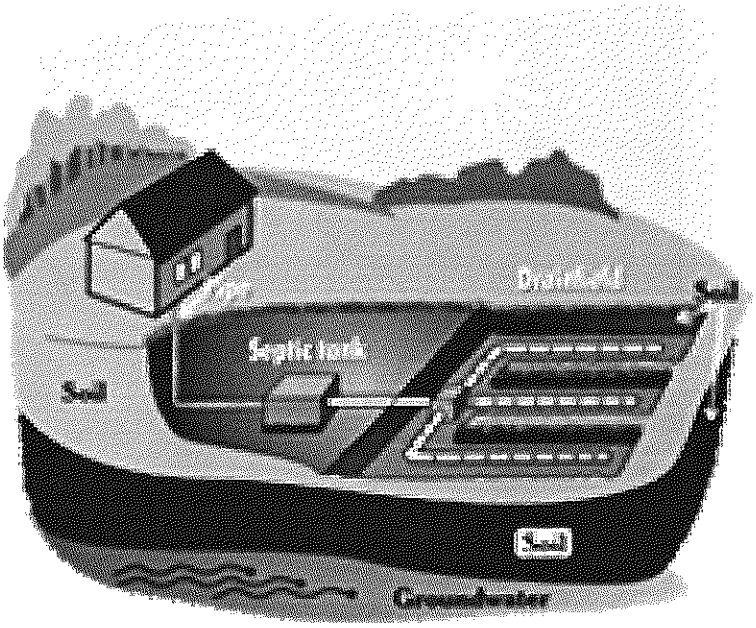
Nonetheless, the need for good erosion control planning still exists on permitted sites as a means to ensure that new home owners are addressing potential problem areas. Examples of erosion control measures include such things as immediate temporary seeding and silt fence on slopes, addressing water coming off new driveways and other non-pervious areas, and landscaping plans along with permanent seeding of lawns. These practices should be accomplished as soon as reasonably possible after construction in order to reduce soil erosion and the resulting sedimentation into surface waters of the county.

Houston County recognizes the need to address the potential sedimentation into local streams and rivers from new building sites. If good planning in terms of erosion control on new building sites and protection of vulnerable sites is not taken into consideration, a profound negative impact on surface waters is the result.

The sensitive Karst topography is also impacted by rural septic systems. The shallow soils of the Karst region sometimes pose a challenge in providing enough separation between the bottom of a typical drain field and the bedrock below. When soil depth is not suitable, mound or at-grade septic systems are the alternative as required by the state's septic rules.



Houston County estimates approximately 2,000 non-conforming sewage treatment systems are currently in existence. Some of these include straight pipes that outlet into ditches or other drainage ways; others may be deficient in adequate soil depth or are out letting onto the surface of the ground.



All of these non-conforming systems are in need of updating and are continually being addressed as time allows. A Department of Agriculture AgBMP loan is available to homeowners that have non-conforming septic systems to help them bring these systems in compliance.

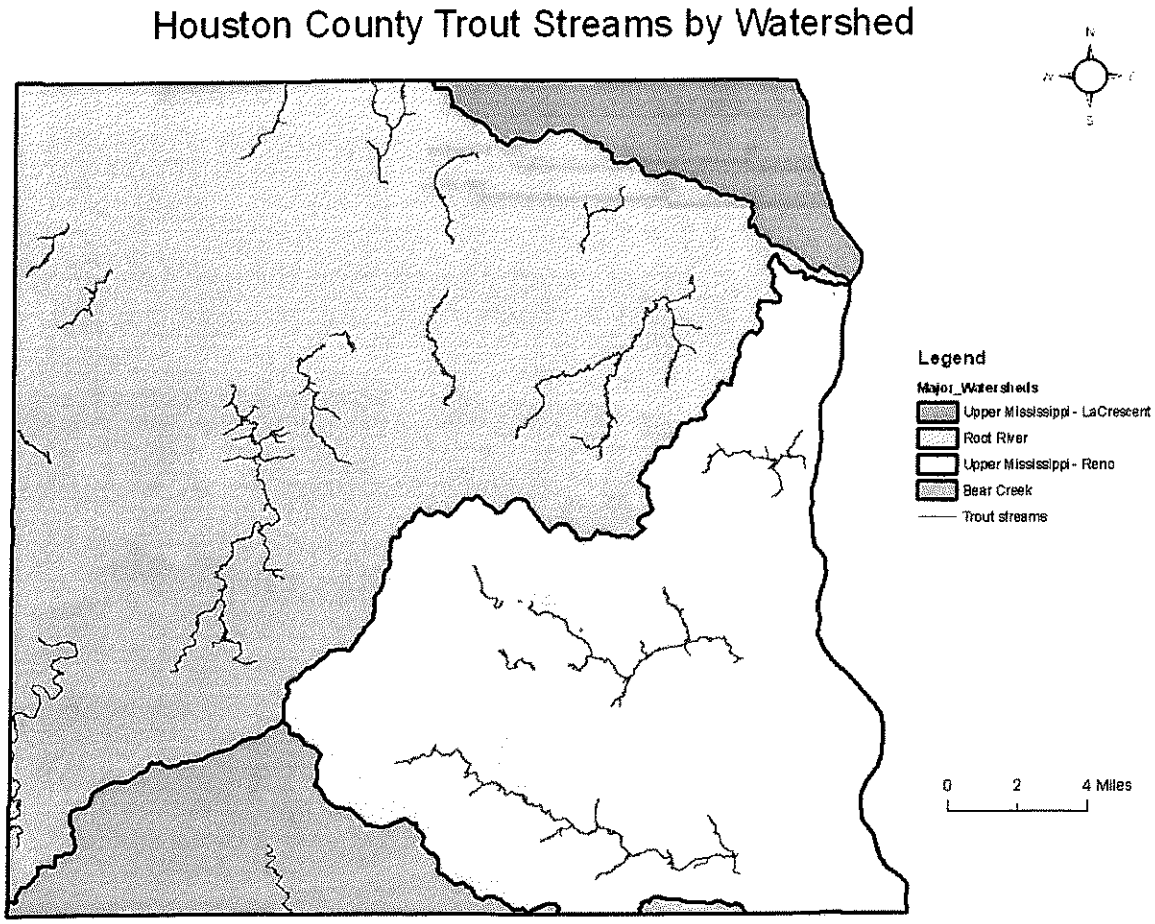
Issue 3: Recreation Uses of Water and Impact to the Environment

Houston County has long been a recreational paradise with miles of trout streams, abundant wildlife and scenic bluffs. The lock and damn system installed in the mid 1930's added additional recreation opportunities for boaters and fisherman.

Recently, habitat development on river islands through U.S. Army Corps of Engineers dredging operations continues to provide expansion of recreational opportunities.

Access to trout steams and other water resources have been an issue for sportsman and land owners. Confusion on trespass regulations increase demand for public access and fishing regulations on certain streams are a few of the issues facing future recreational usage of this resource.

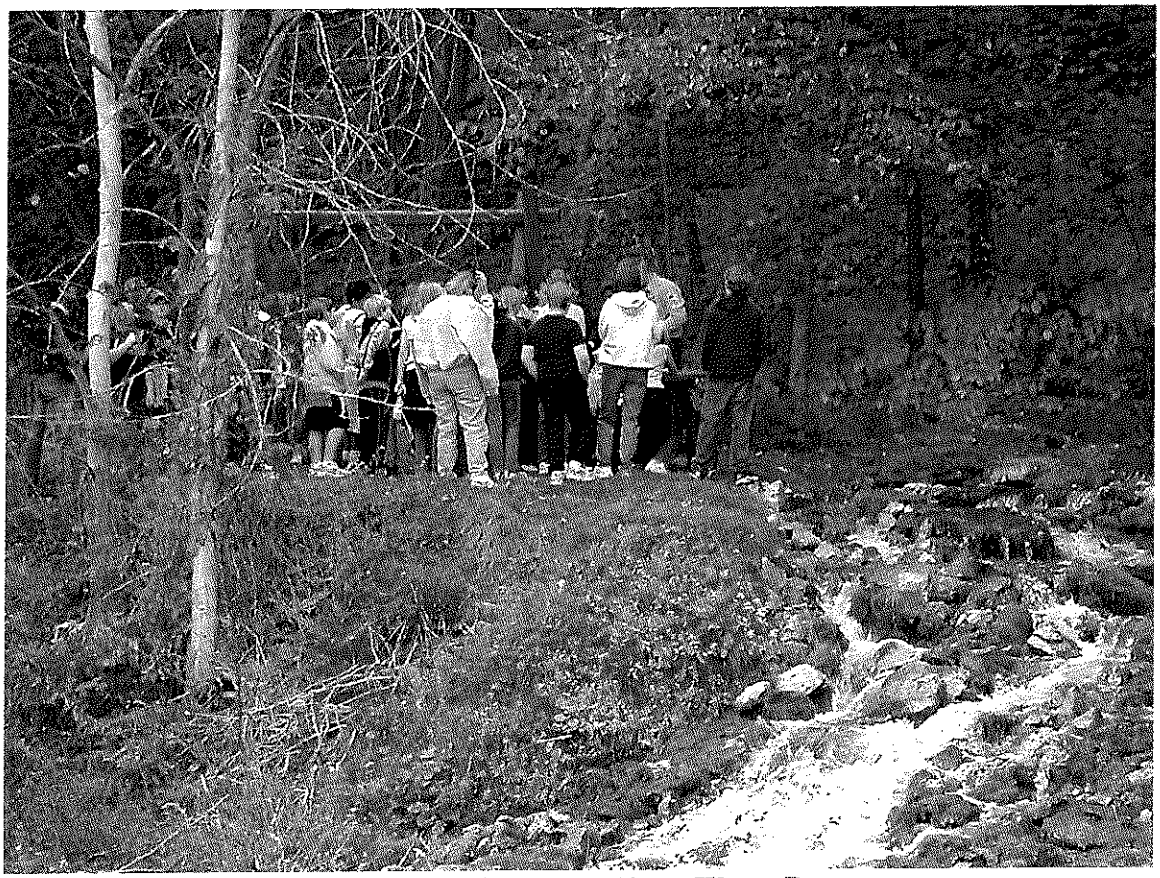
Concerns for maintaining pristine conditions for trout habitat have emphasized the need for runoff control, erosion control and sediment reduction, particularly in the Beer Creek and Winnebago Creek Watersheds.



Issue 4: Education and Awareness of Resources and Sensitivity

Education and awareness of our water resource continues to be a cornerstone of Houston County's Water Plan. Maintaining an ongoing effort to inform the public of resource needs, resource impairments and resources protection measures has been identified as the most important tool in addressing water resource concerns.

Recently, state reduction in funding has severely limed out ability to maintain adequate levels of information/education activities.



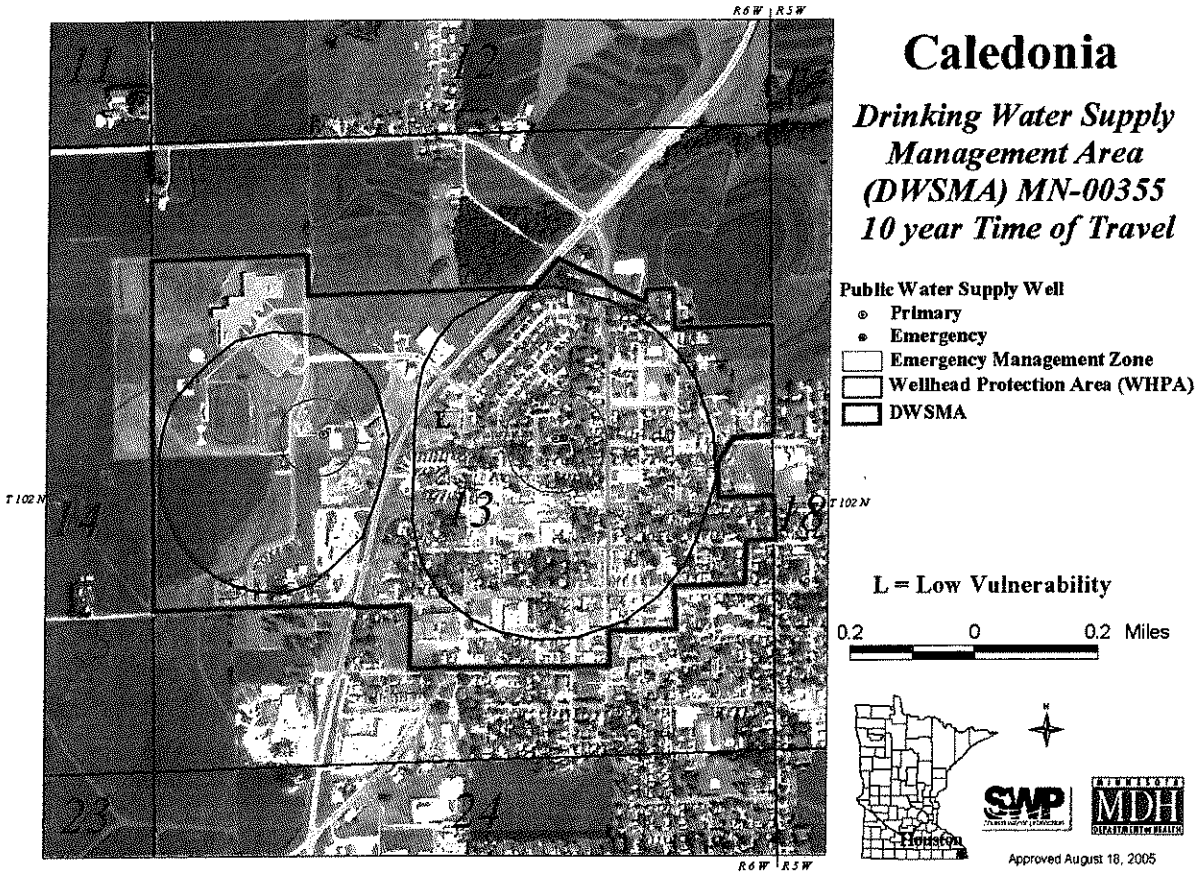
Students Learning About Water Resources

Issue 5: Ground Water Sensitivity in Karst Topography

Complex interconnections between surface water and groundwater exist throughout the "Karst" region of Southeast Minnesota. Sink holes and fractionized bedrock provide a rapid conduct from surface to ground water. Surface contaminants can move quickly to the upper aquifers. Thin soil layers provide little filtration.

Contamination of public drinking supply has been identified in Spring Grove area. The status of the contamination is monitored by Minnesota Public Health. *(See Attachment #6 - Notice of Designation of Special Well Construction Spring Grove).*

The City of Caledonia has developed a well source protection plan. The County will cooperate with Caledonia in implementing their plan.



Limited monitoring of private wells has indicated scattered incidences of high nitrates, primarily in cases of improperly cased and generated wells. Further sampling is needed for an accurate assessment of this complex issue.

Goals and Objectives

GOAL #1 – Protect ground water in order to maintain an adequate supply of safe drinking water for current and future generations.

A. Provide technical and financial assistance to land users to properly manage and utilize agricultural waste.

B. Address non-conforming Individual Sewage Treatment Systems (ISTS).

C. Well tests.

GOAL #2 – Improve surface water quality in rivers and streams in Houston County.

A. Explore methods to slow decline in hayland production throughout Houston County.

B. Provide incentives to adopt conservation practices which will offset the effects of current cropping trends on run off and erosion in Houston County.

C. Provide technical and financial assistance to establish practices that reduce sediment delivery to streams in Houston County.

D. Provide technical and financial assistance to land users to establish practices which will reduce discharge of pollutants from animal feedlots.

GOAL #3 – Manage storm water runoff to minimize risk to human life, property and the environment.

A. Provide technical and financial assistance to establish practices that reduce sediment delivery.

B. Explore opportunities to reduce peak flow form rural and urban residential development.

C. Explore opportunities for solutions to flooding concerns on the Root with upstream jurisdiction and other partners.

D. New technology.

GOAL #4 – Optimize recreational uses of water resources.

A. Recreation access to water resources.

GOAL #5 – Review of city and township ordinances for compliance.

A. Administer all provisions of Houston County Water Plan.

Implementation Schedule

GOAL #1 - Protect ground water in order to maintain an adequate supply of safe drinking water for current and future generations

Issues/Objectives	Actions/Brief Description	Lead Agency(ies)	Est. Cost In-kind	Est. Cost Cash	Timeline
A. Provide technical and financial assistance to land user to properly manage and utilize agriculture waste	*1. Provide technical assistance on ag waste management on 20 per year.*	*SWCD/SRF*		*10,000/yr*	*2007-2012*
	2. Establish demonstration plot exploring manure application rate and nitrogen rates.	*Extension*		*1,000*	*2008*
	3. Manure Application Field Day	*SWCD - Extension*		*500*	*2009*
B. Address non-conforming Individual Sewage Treatment Systems (ISTS)	*1. Update 50 non-conforming ISTS.*	*Zoning*	*10,000/yr*		*Ongoing*
	2. Inspect all new & upgraded ISTS.	*Zoning*	*10,000/yr*		*Ongoing*
	3. Administer Ag BMP loan program.	*Zoning*	*3,000/yr*		*Ongoing*
	4. Enter all new & upgraded ISTS inspected since 1985 on parcel base.	*Zoning*		*20,000*	*2009*
C. Well Tests	*1. Offer free infant well tests to 15 families/year.*	*Public Health*	*500/yr*	*500/yr*	*Ongoing*
	2. Offer well water testing at low cost to landowners.	*SWCD*	*500/yr*		*Ongoing*
	3. Participate in SE MN volunteer well monitoring network.	*SWCD*		*15,000*	*2008*

Implementation Schedule

GOAL #2 - Improve surface water quality in rivers and streams in Houston County

Issues/Objectives	Actions/Brief Description	Lead Agency(ies)	Est. Cost In-kind/Cash		Timeline
A. Explore methods to slow decline in perennial vegetation.	1. Promote existing programs which offer incentives to establish/maintain perennial vegetation.	SWCD/MES	500/yr		2008-2012
	2. Develop local/regional incentives to establish 1000/acres of perennial vegetation annually.	SWCD/MES		20,000/yr	2008
	3. Information/education campaign or importance of hay land for erosion control and runoff reduction.	MES/HC	500/yr		Ongoing
	4. Assist with quality tested hay auctions.	MES/SWCD	1,000/yr		Ongoing
	5. Assist with implementation/administration of programs that support/promote animal agriculture.	SWCD/MES	1,000/yr		Ongoing
B. Provide incentives to adopt conservation practices which will offset the effects of current cropping trends on runoff and erosion in Houston County	1. Establish incentive program to plant fall cover crops.	SWCD	1,000/yr	1000/yr	2007-2010
C. Provide technical and financial assistance on feedlots	1. Provide financial assistance on low-cost feedlot fixes on 15 lots per year.	Zoning/SWCD	10,000/yr	30,000/yr	2007-2010
	2. Provide technical assistance on 20 feedlots per year.	SWCD	10,000/yr	10,000/yr	2007-2010
	3. Promote residue management on highly errodable land.				
	4. Explore possibilities for wetland restoration.				
	5. Explore methods to reduce intensity of grazing in sensitive areas.				

Implementation Schedule

GOAL #3 - Manage storm water runoff to minimize risk to human life, property and the environment

Issues/Objectives	Actions/Brief Description	Lead Agency(ies)	Est. Cost In-kind	Est. Cost Cash	Timeline
A. Provide technical and financial assistance to establish practices that reduce sediment delivery	1. Provide financial incentives to establish 20 push-up ponds annually.	SWCD	2,000/yr	10,000/yr	2007-2012
	2. Develop program providing storm water retention through road culvert size reduction on township and county roads.	SWCD/HC DOT	2,000		2007
	3. Explore effectiveness of road retention structures and the barriers/obstacles to implementing on 2 pilot sites.	SWCD/HC DOT		10,000	2008
B. Explore opportunities to reduce peak flow from rural and urban residential development	1. Provide home site evaluations on all rural building sites.	Zoning/SWCD	5,000/yr		Ongoing
C. Explore opportunities for solutions to flooding concerns on the Root with upstream jurisdictions and other partners	1. Participate with US Fish and Wildlife and other partners on Root River committee.	SWCD	500/yr		2008
D. New Technology	1. Explore funding for innovative pilot programs to demonstrate new technology for water resource protection.	All		40,000	2008-2010

GOAL #4 - Optimize recreational uses of water resources

Issues/Objectives	Actions/Brief Description	Lead Agency(ies)	Est. Cost In-kind	Est. Cost Cash	Timeline
A. Recreation access to water resources	1. Operate Wildcat Park.	Houston County Auditor	2,000/yr		Ongoing
	2. Develop Botcher Park.	Houston County	2,000/yr	5,000	Ongoing
	3. Provide access info on Houston County Hwy maps.	Houston County DOT	1,000/yr		2007

Implementation Schedule

GOAL #5 - Review of local and regional plans and ordinances for compliance/compatibility

Issues/Objectives	Actions/Brief Description	Lead Agency(ies)	Est. Cost In-kind	Est. Cost Cash	Timeline
A. Administer all provisions of Houston County Water Plan	*1. Staff part-time Water Plan Coordinator.*	*SWCD*		*15000/yr*	*Ongoing*
	2. Continue participation on SEWRB.	*SWCD*		*5,000/yr*	*Ongoing*
	3. Review local/regional plans to insure compliance with Water Plan.	*SWCD*		*500/yr*	*As Needed*

Ongoing Practices

Houston County will continue to work with federal, state, and local partners to address issues related to our priority concerns. Specific ongoing programs include:

- Conservation provision of Federal Farm Bill
- State Cost-Share Program
- MPCA's Impaired Waters Program
- Minnesota's Wetland Conservation Act
- DNR Shorelands Program
- DNR Protected Waters Program
- U.S. Fish and Wildlife – Private Lands Program
- Root River SWCD's Technical Assistance Program
- Minnesota State Revolving Loan Fund
- EPA 319 Funds
- USDA – NRCS Technical Assistance Program
- Hiawatha Valley RC & D
- Houston County EDA
- MN Ag BMP Loan Program
- Houston County Public and Private Schools

Appendix

Attachment # 1 – Crooked Creek Watershed
Attachment # 2 – Priority Concerns Scoping Document
Attachment # 3 – Houston County Slopes over 20% by Watershed
Attachment # 4 – Houston County Feedlots by Watershed
Attachment # 5 – Houston County FEMA Floodways by Watershed
Attachment # 6 – Notice of Designation of Special Well Construction – Spring Grove

(Attachment #1)

CROOKED CREEK WATERSHED

CONSERVATION WORKING FOR YOU

"INTRODUCTION"

Crooked Creek Watershed is located in Houston County, the most southeastern county in Minnesota. The watershed drains a 70 square mile area into the Mississippi River.

The watershed is 13 miles long and four to seven miles wide.

The topography in the watershed is characterized by deeply entrenched narrow stream valleys. The valley walls are very steep, rising 300 to 400 feet above the valley floor. This makes Houston County one of the most scenic areas in the state.

There are 207 farms in the Crooked Creek Watershed averaging 220 acres in size. These farms consist of 23,000 acres of cropland, 9,000 acres of pasture and 11,000 acres of woodland. The farmers living in the watershed have applied 85% of the conservation practices needed for erosion and runoff control on their farms. These conservation practices along with good farm management practices have given the farmers of Houston County the honor of having the highest corn yield in the state, which is 105 bushels per acre.

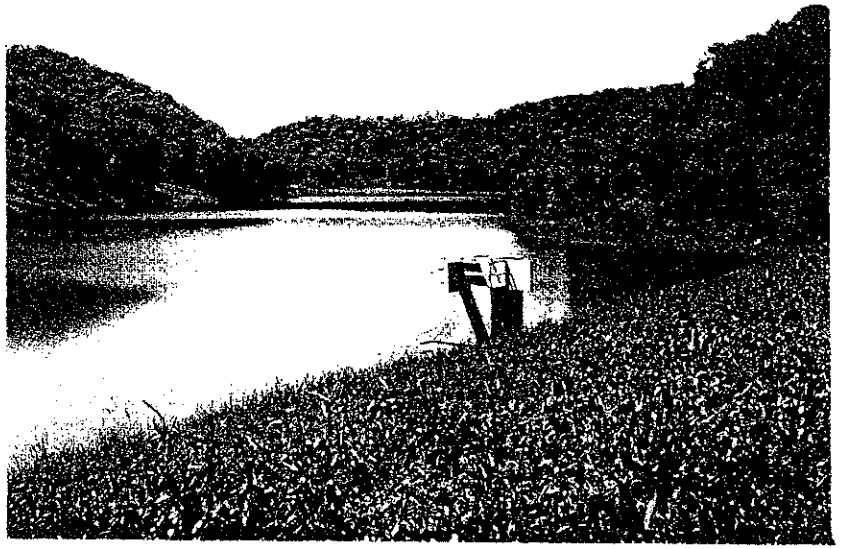
"PL 566 WATERSHED PROMOTES CONSERVATION PRACTICES"

The farmers in this watershed are to be commended for the conservation practices they have applied. The practices in this watershed are a visible sign of their effort to improve the environment.

Some of the major practices are:

Contour Strip	8,000	acres
Contour Farming	14,000	acres
Field Terraces	500,000	feet
Diversion Terraces	35,000	feet
Waterways	158	acres
Ponds	42	ponds
Grade Stabilization Structures	34	
Floodwater Retarding Structures	10	
Wildlife Upland Management	107	acres
Tree Planting	428	acres

This watershed is a good example of local people and government agencies working together.



R-2

This dam is 40 feet high. It took 79,000 cu. yds. of earth to build and it cost about $100,000. The dam has a drainage area of 2,000 acres. The permanent lake is 8 acres and during flood time increases to 20 acres.

The land around the lake has been purchased by the Minnesota Department of Natural Resources, Division of Lands and Forestry. This area is being used by the public as it is one of the most scenic areas in the state. The Division of Fish and Game has stocked the lake with trout, which provides good fishing.

R-3

This is the largest floodwater dam in the watershed. There are 8,100 acres draining into a permanent lake of 30 acres. This lake will cover 90 acres during flood periods. It took 230,000 cu. yds. of earth to build the dam which is 46 ft. high at an approximate cost of $340,000.

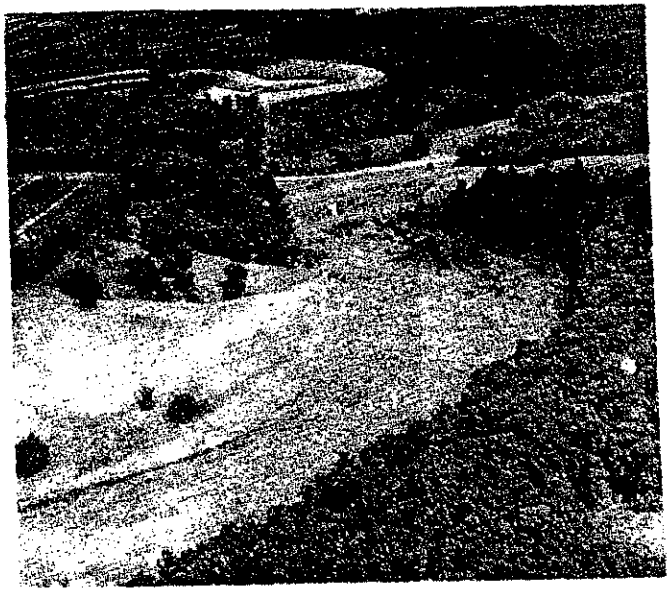
The lake has been stocked with trout by the Minnesota Department of Natural Resources, Division of Fish and Game. This dam and the others will improve seven miles of Crooked Creek trout habitat by reducing flooding and sedimentation.

R-4

FLOODWATER CONTROL DAM

This dam is 46 ft. high and contains 86,200 cu. yds. of earth. The pond for floodwater is 27 acres. The drainage area for this structure is 3.9 sq. miles or 2,700 acres. This dam also reduces flooding and sedimentation down stream.

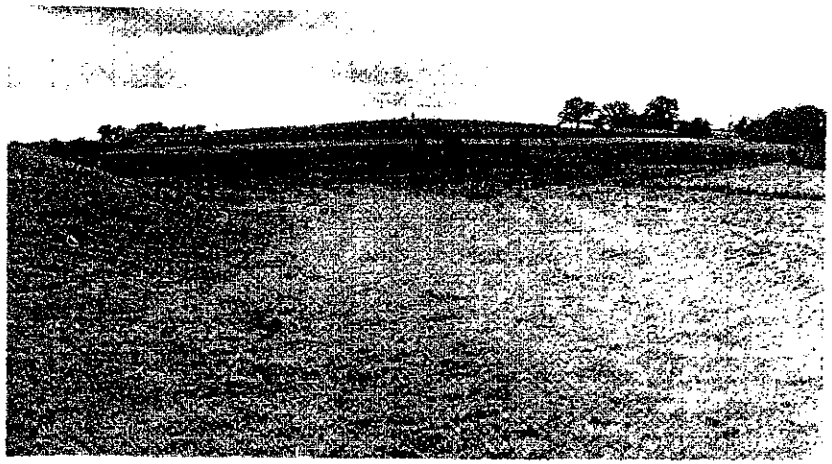
The cost was approximately $100,000.



R-1 FLOODWATER CONTROL DAM

This dam was constructed 43 feet high to hold back the excess water which the conservation practices in the watershed could not control. It took 48,900 cu. yds. of earth to construct this dam at a cost of approximately $55,000. The pool behind the dam when filled with water will cover 22 acres of land.

There are 2,100 acres of watershed above the dam. This dam now holds back the excess runoff which in the past has caused severe damage to cropland, pasture, trout streams, roads and bridges down stream.



S-2

This is the largest waterway that was installed. It has a 100 foot bottom.

OTHER WATERWAY STRUCTURES

There are three grade stabilization structures which have been installed S1A - S1B and S-3 and a waterway above S1A, also some streambank control measures. The trout stream improvement will be done by the Department of Natural Resources with assistance of Public Law 566 funds.

"SPONSORS"

Sponsors of the Crooked Creek Watershed project were the Root River Soil and Water Conservation District Supervisors and the Houston County Board of Commissioners.

The technical help and cost sharing of the project measures were provided by the U. S. Soil Conservation Service under Public Law 566. Application for help was made by the local people to the State Soil Conservation Committee in 1956. The Crooked Creek Watershed District was established in 1959 for the purpose of constructing and maintaining the project. The Crooked Creek Watershed was authorized for construction March 14, 1961. All the work has been completed except for the trout stream and streambank improvement, which is scheduled to be completed in 1973.

Other government agencies assisting with the development and planning of the Watershed project are: The Forest Service, Agricultural Extension Service, Agricultural Stabilization and Conservation Service and the Minnesota Department of Natural Resources.

(Attachment #2)

Houston County
Local Water Management Plan

Priority Concerns Scoping Document

March 2005

The priority concerns scoping document for the Houston 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 Houston County Water Management Task Force has chosen along with a detailed account of how the concerns were identified and selected.

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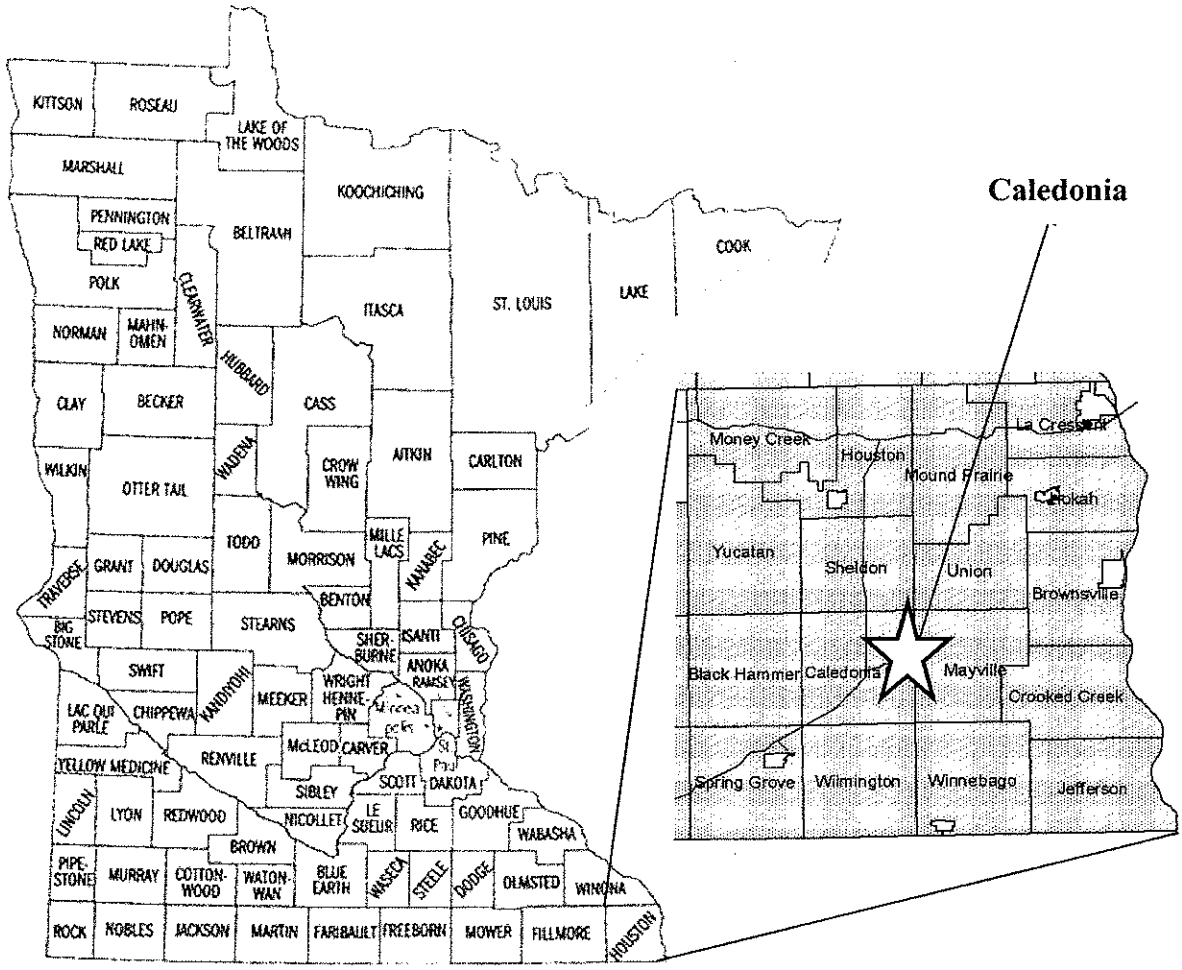
Introduction

Houston County is located in the extreme southeastern corner of Minnesota, bordered by the Mississippi River to the East, and the state of Iowa to the South. Fillmore County and Winona County are neighbors to the West and North, respectively.

The population of the county is 19,965[1]. Houston County is experiencing stable to moderate growth.



Land Use

The county is primarily a rural county with a strong agricultural base of dairy, beef, hogs, corn, beans, and alfalfa/grass hayland. A shift in recent years from small family farms to larger livestock and cash grain operations and rural residential and recreational land owners, has led to revisions in land-use ordinances.

Climate

Houston County's average annual precipitation is 34 inches. Approximately 71% or 24" of that precipitation usually falls in April – September. This relatively high precipitation, together with the steep topography, creates a high potential for soil erosion and flash flooding.

[1] Minnesota State Demographic Center, 2003 Population Estimates

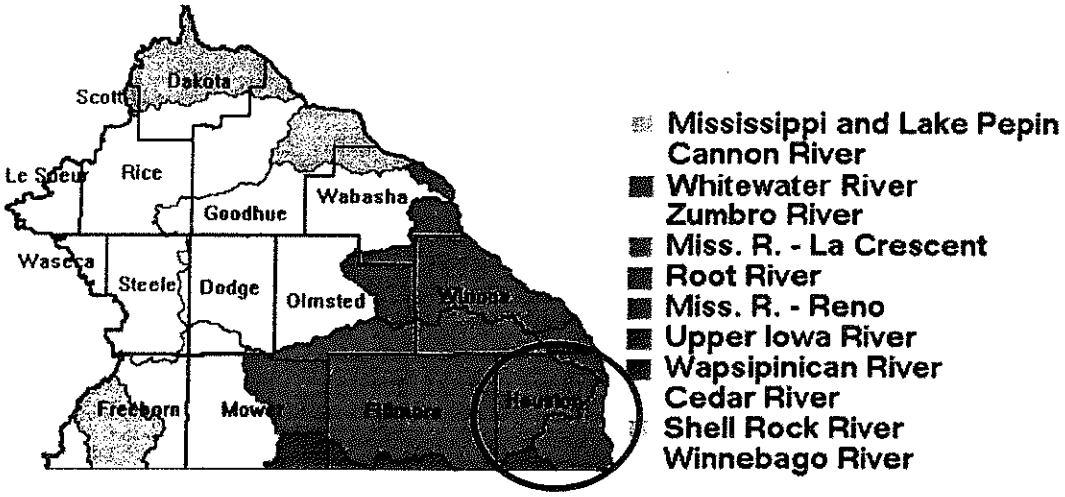
Local Government Unit

Houston County is responsible for the Local Water Management Plan, implemented through an advisory board appointed by the County Commissioners with administrative assistance provided through the Root River Soil and Water Conservation District. The original plan was adopted on April 11, 1990, and was updated in 1995 and 2000. The current plan will expire on December 13, 2005.

Physiography

On the western edge of the driftless region of the upper Mississippi Valley, Houston County has the most rugged topography of any county in Southern Minnesota. The steep terrain restricts farming to the narrow ridge tops and broad valleys, separated by slopes of 30 70%, reserved primarily for forestland and remnant prairie communities.

Watersheds



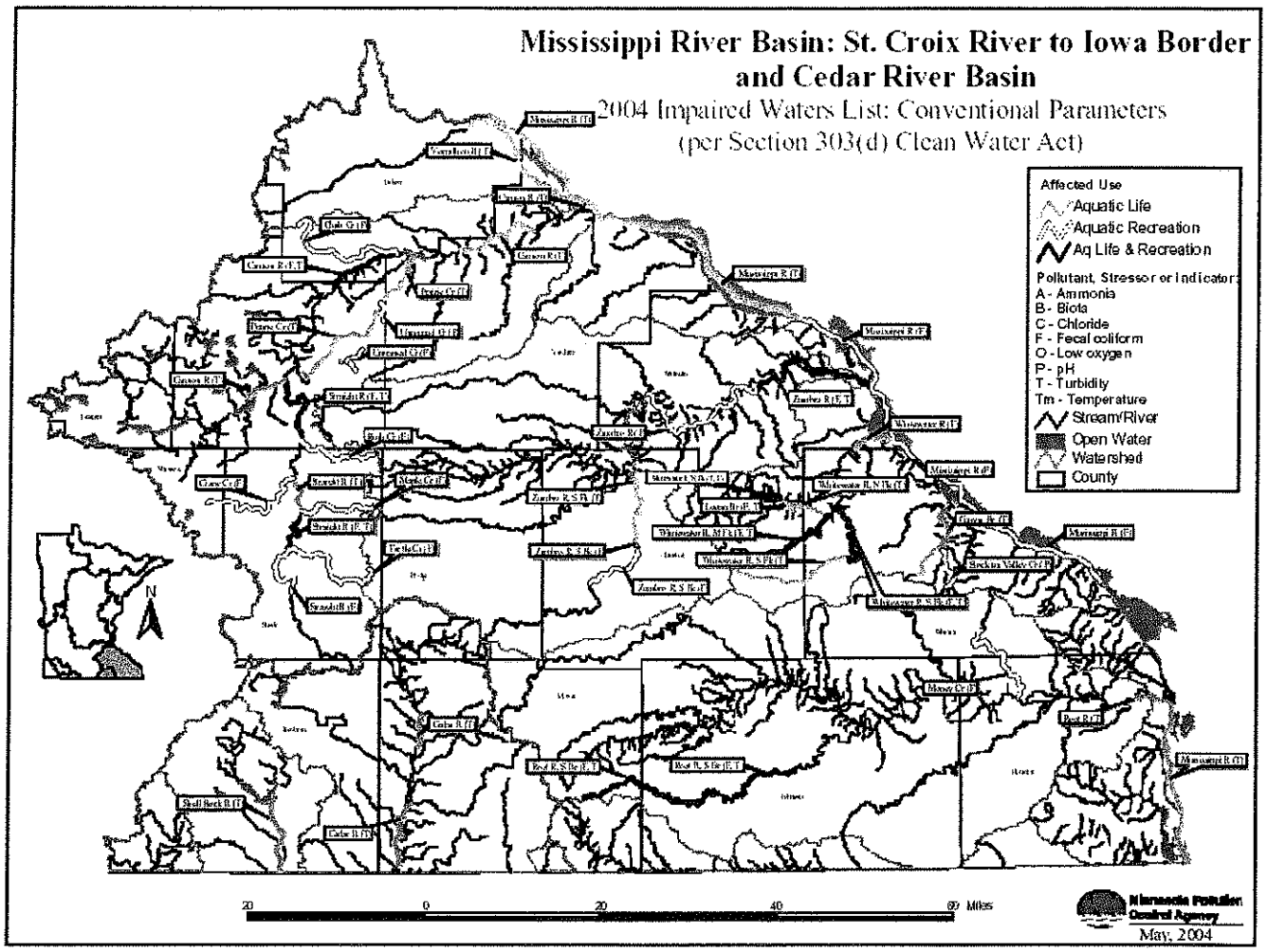
Sixty percent of the county drains to the Root River. This watershed is influenced by runoff from portions of Fillmore, Olmstead, Mower, and Winona Counties. Lower reaches of the Root are listed as impaired waters for turbidity and fecal coliform.

The historic course of the River has been altered through ditching and dikes/levies and the adjacent flood plains developed into primarily agricultural use. The area is prone to frequent flooding do to breaches in the dike, ice dams on bridges, and influx of Mississippi backwaters.

The remainder of the County is divided into 3 watersheds, the upper Iowa, upper Mississippi Reno, and the upper Mississippi La Crescent. The upper Iowa contains sub watersheds of Bear Creek, Bea Creek, and Dorchester Creek in the southwest and south central part of the county. Although located in the upper reaches of the watershed, some areas are subject to flash flooding, particularly in Dorchester, Iowa and portions of the Bear Creek. Bear Creek is currently in the construction phase of a PL-566 flood control project. This watershed has features consistent with the "Decorah Edge" and is also highly prone to sinkholes and other Karst features.

The upper Mississippi - Reno is a very rural watershed, divided into the sub watersheds of the Crooked Creek and the Winnebago Creek. Winnebago Creek experiences frequent flash flooding and high erosion rates. Local attempts to secure funding for flood control have been unsuccessful. Crooked Creek has a Watershed District and several flood control projects were installed in the 1960's. These structures are approaching their design life span. This reach of the Mississippi River is listed as impaired waters.

The upper Mississippi – La Crescent Watershed is a rapidly developing watershed near La Crescent, which is bedroom community for La Crosse, WI. Primary issues include residential development on steep slopes, development pressure on wetlands/surface water resources, and storm water run-off.



Priority Concerns

A series of public input sessions were held, as well as invitations for comment to local units of government, neighboring counties and state agencies in identifying/developing priority issues. The following is a chronology of these events.

September 7, 2004	Resolution by County to update Water Plan
September 15, 2004	Notice to local governments & state agencies
November 4, 2004	Review of comments by Water Plan Committee *(see Appendix 1)*
December 3, 2004	Reviewed issues with adjacent counties (Winona, & Fillmore)
January 12, 2005	Article in Caledonia Argus inviting comments
January 19 & 26, 2005	Public notice in the Caledonia Argus
January 26 & 31, 2005	3 Public Input Sessions *(see attachment 1)*
February 3, 2005	Review of comments by Water Plan Committee
February 9, 2005	Article in Caledonia Argus regarding plan update
March 3, 2005	Draft Scoping Document approved by Water Plan Committee

Public Input Sessions for Water Plan Update

Sixteen individuals participated in three public input sessions held regarding the update of Houston County's Comprehensive Water Management Plan. Following a review of Houston County's existing plan, updates were given on progress and past projects by U.S. Fish and Wildlife Service, Houston County Environmental Services, Houston County Feedlot Officer, Root River Soil and Water Conservation District, and Houston County Highway Department.

Participants then discussed future changes to the Water Plan, along with proposed comments from local and state agencies. Few changes were suggested to the current plan. The current plan includes the following 5 main goals: 1) Improve Surface Water Quality in Rivers & Streams in Houston County, 2) Manage Storm Water Runoff to minimize risk to human life, property, and the environment, 3) Protect ground water in order to maintain an adequate supply of safe drinking water for current and future generations, 4) Optimize Recreational Uses of Water Resources, and 5) State mandated additions to Comprehensive Water Plan.

Suggestions were made to consider moving protecting drinking water safety to the number one priority. Another suggestion was made to review the city land use plans to ensure compatibility with the county plan. Stream monitoring was also discussed.

Issues Identified by Stakeholders

Issues identified by the Water Plan Committee as priority concerns in conjunction with public input are:

1. Protect ground water in order to maintain an adequate supply of safe drinking water for current and future generations.
2. Improve surface water quality in rivers and streams in Houston County.
3. Manage storm water runoff to minimize risk to human life, property, and the environment
4. Optimize recreational uses of water resources
5. Review of city & township ordinances for compliance.

While these issues may vary in priority from one watershed to the next, each of these items is considered a high-priority in each watershed.

Attachment #1

List of Participants / Affiliated Organizations

Ralph Tuck	Root River SWCD, District Manager
Ryan Henry	Houston County News
Jan Lee Buxengard	Spring Grove Herald
Jim Nissen	U.S. Fish and Wildlife Service
Vernon Fruechte	Root River SWCD, Supervisor
Ervin Barth	Citizen
Kenneth Meyer	Citizen Advisory Council/Water Plan Committee
Francis Bruening	Citizen Advisory Council/Water Plan Committee
Allen Henke	Houston County Highway Department
Rick Frank	Houston County Environmental Services
Ann Thompson	Houston County Commissioner
Sue Sheehan	Root River SWCD, Secretary
Dave Heiler	Caledonia Argus
Jim Solum	Citizen Advisory Council/Water Plan Committee
Wayne Feldmeier	Citizen Advisory Council/Water Plan Committee

Appendix #1

List of Local Government and State Agencies Comments

I. Environmental Quality Board

1. Ground Water Contamination Susceptibility
   (see Issue #1 and Issue #5)
2. TMDL – Impaired Waters
   (see Issue #2)
3. Ground Water Availability
   (see Issue 1)
4. MCD Population Extrapolations for Houston County
   (see Page 3)

II. Caledonia Township

1. Formation of Winnebago Watershed
   (see Issue #3)

III. Minnesota Department of Natural Resources

1. Holding Water on the Landscape
   (see Issue #3)
2. Groundwater Protection in Karst Areas
   (see Issue #1)
3. Mississippi River Floodplain Management
   (see Issue 3 and Issue 4)
4. Trout Stream Protection
   (see Issue 2, 4, and 4)

IV. Minnesota Department of Agriculture

1. Soil and Water Conservation Practices and Structures
   (see Issue 2 and 3)
2. Manure Management and ISTS
   (see Issue 1 and 2)
3. Pesticides
   (see Issue 1)

V. Board of Water & Soil Resources

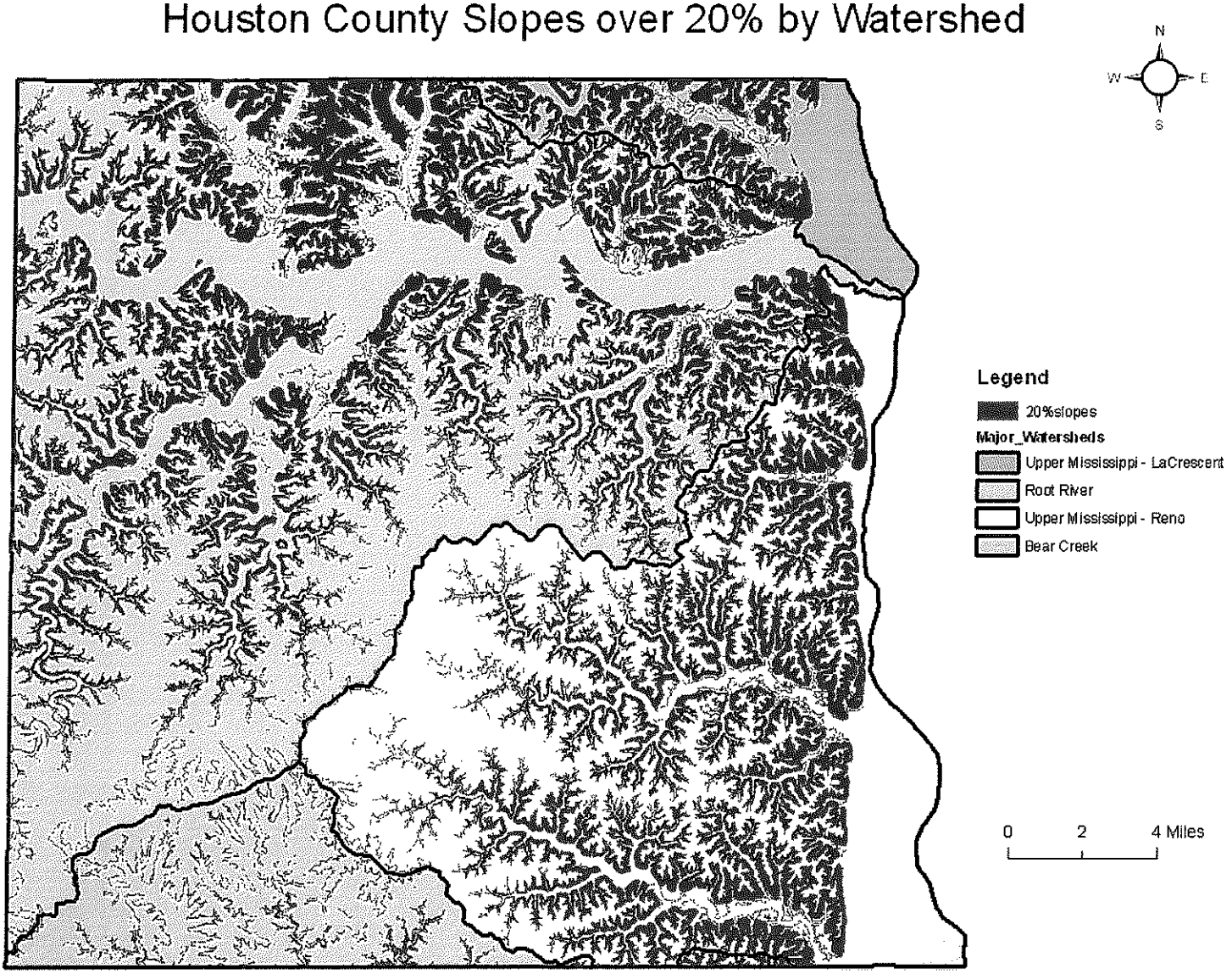
1. Manage rural and urban storm water runoff and erosion control to improve water quality and minimize flood damage.
   (see Issue 3)
2. Manage the surface and ground water quality interconnections in this karst geology to improve water quality.
   (see Issue 1 and 2)
3. Implement comprehensive nutrient management practices in selected rural and urban areas.
   (see Issue 1 and 2)

VI. Minnesota Pollution Control Agency

1. Impaired Waters/Total Maximum Daily Loads (TMDL)
   (see Issue 2)
2. Trout Streams
   (see Issue 2 and 4)
3. Karst Landscape Management
   (see Issue 1)
4. Erosion and Runoff Control
   (see Issue 2 and 3)
5. Feedlots and Land Application of Manure
   (see Issue 1)
6. Other Factors to Consider
   (see Issue 1 and 2)

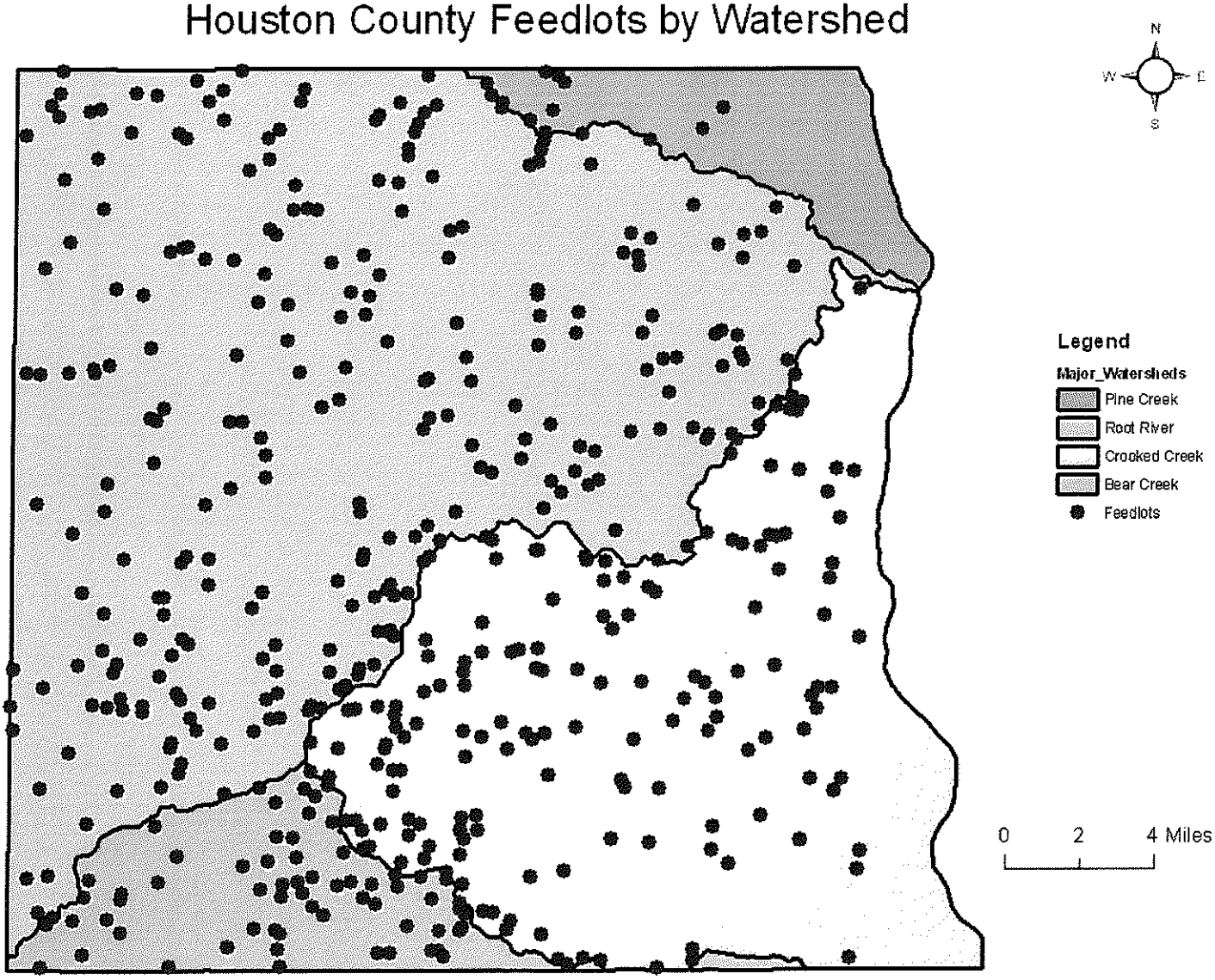
Attachment #3

Houston County Slopes over 20% by Watershed



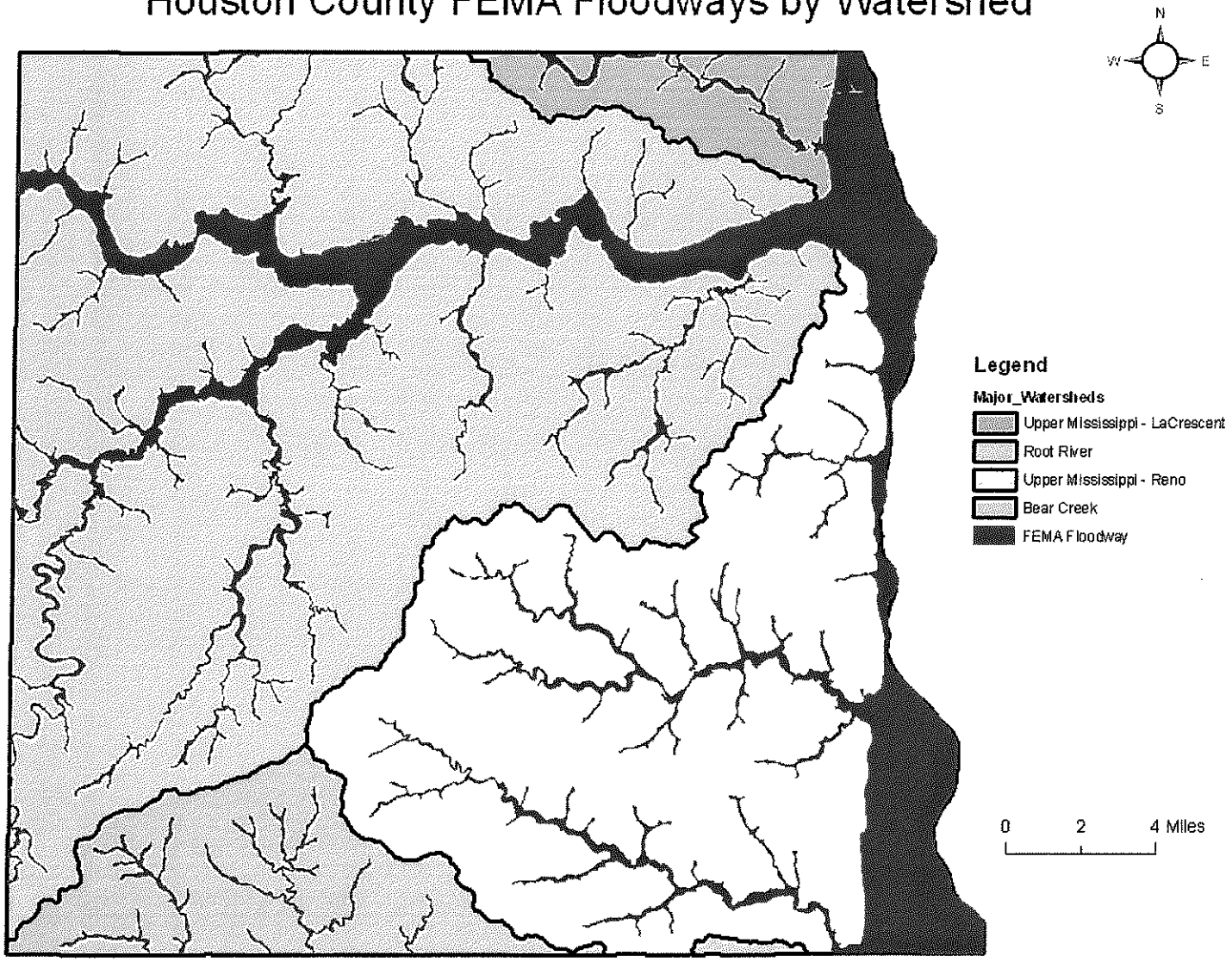
Attachment #4

Houston County Feedlots by Watershed



Attachment #5

Houston County FEMA Floodways by Watershed



MINNESOTA MDH DEPARTMENT OF HEALTH

Attachment #6

Protecting, maintaining and improving the health of all Minnesotans

DATE: December 13, 2006

TO: Licensed and Registered Well Contractors
Mr. Michael Wiste, Spring Grove Township
Mr. Paul Morken, City of Spring Grove
Mr. Richard Frank, Houston County
Advisory Council on Wells and Borings

FROM: John Linc Stine, Director
Environmental Health Division
P.O. Box 64975
St. Paul, Minnesota 55164-0975

SUBJECT: Notice of Designation of a Special Well Construction Area in Spring Grove Township and the City of Spring Grove, Houston County

The Minnesota Department of Health (MDH) is designating a SPECIAL WELL CONSTRUCTION AREA (SWCA), which includes the city of Spring Grove and an area bordering the city to the north, east, and south of the city, in Houston County (Figure 1). The SWCA designation, which becomes effective January 1, 2007, applies to the construction, repair, modification, and sealing of wells and borings, and remains in effect until further notice.

SITE HISTORY

The city of Spring Grove is the third largest city in Houston County and is located along State Highway 44, approximately 15 miles southwest of Caledonia. In 1984, routine monitoring of the Spring Grove municipal wells identified contamination by 1,1,2-trichloroethylene (TCE) in Municipal Well Number 3 located in easternmost Spring Grove. Subsequent sampling of private wells and monitoring wells identified TCE contamination in all three municipal wells and a number of private wells, particularly east and southeast of the city.

The source of contamination was identified as the site of the Northern Engraving Corporation (NEC), which had previously been used by Control Data Corporation (now Ceridian) as a printed circuit board plant.

A number of remedial actions have been taken, including:

- Installation of an air stripper on Municipal Well Number 3 in 1989.

- Pumpage of Recovery Well Number 5A, starting in 1991, with conversion to a dual-phase, vapor extraction system in 2000. Discharge is treated by carbon treatment before discharge to sanitary sewer.
- Pumpage of Municipal Well Number 1, starting in 1989, with discharge to storm sewer and Seven Mile Creek (Aeration reduces TCE contamination).
- Conversion of a private well to a monitoring well/recovery well, with pumping and discharge to the sanitary sewer system, starting in 1993.
- Excavation of 30-35 cubic yards of TCE-contaminated soil at the NEC facility in 2000, and capping the remaining source area soils with asphalt.
- Installation of carbon treatment systems on six private wells used for potable water supply (currently four wells are still in use).

In July 2000, the Minnesota Pollution Control Agency (MPCA) requested that the MDH consider establishing a SWCA for Spring Grove. In 2002, the United States Environmental Protection Agency (USEPA) reevaluated the health risks associated with TCE, the primary contaminant of concern in Spring Grove. Subsequently, the MDH issued an interim recommended exposure limit of 5 micrograms/liter (5 μg/l). Ongoing monitoring conducted by Gannett Fleming, consultant to Northern Engraving Corporation (NEC) and Ceridian Corporation (CDC), indicates that the extent of groundwater contamination has stabilized and does not appear to be migrating. However, TCE at concentrations exceeding 5 μg/l persists in groundwater in and near Spring Grove.

SITE HYDROGEOLOGY

The city of Spring Grove is located on a bedrock plateau, with deeply incised valleys radiating out to the north and the south, with a drop in elevation on the order of 200-250 feet. This area is within the "driftless" area, and the unconsolidated materials consist of approximately 10-15 feet of loess on top of bedrock.

The first bedrock within the city of Spring Grove is the Galena limestone. The first bedrock in the valleys near the city is St. Peter sandstone or Shakopee dolomite (part of the Prairie du Chien group). Groundwater within the Galena limestone, Platteville limestone, and St. Peter sandstone is perched, the units are not fully saturated, and they generally have not been used for water supply.

Prior to implementation of state-wide well regulation in 1974, the construction of many wells simply involved placement of casing to rock, with open-hole completion through all of the geologic units from the Galena limestone through the Prairie du Chien group.

This construction method perforated two major regional confining layers--the Decorah shale and the Glenwood shale, which normally would provide excellent protection of the underlying hydrogeologic units from surface contamination migrating downwards. Even wells that were cased through these confining layers may not have been grouted to seal the annular spaces, making them, in effect, multiaquifer wells. It appears that multiaquifer wells on or near the NEC site may have played some role in contamination migrating at least into the Prairie du Chien group. These well construction problems also create uncertainty as to exactly where the TCE contamination occurs, since any water sample from a particular well may reflect contributions from more than one aquifer.

PUBLIC HEALTH CONCERNS

The primary contaminant of concern within the SWCA is TCE. TCE was most commonly used as a degreasing agent for cleaning metal parts and surfaces. Exposure to high levels of TCE in drinking water can damage the liver, kidneys, immune system, and nervous system. Exposure to low levels of TCE over a long period of time may be linked to an increased risk of several types of cancer. TCE may also harm a developing fetus if consumed in high concentrations by an expectant mother. The interim recommended exposure limit for TCE in drinking water is 5μg/l.

BOUNDARIES OF THE SPECIAL WELL CONSTRUCTION AREA

The location of the SWCA is shown on the attached map (Figure 1). This area includes Sections 11, 12, 13, and 14 of Township 101 North and Range 7 West. The entire limits of the city of Spring Grove are within the SWCA.

REQUIREMENTS IN THE SPECIAL WELL CONSTRUCTION AREA

1. All wells and borings regulated by the MDH are subject to the requirements of this SWCA. Wells include water-supply wells (domestic, public, irrigation, commercial/industrial, cooling/heating, remedial), monitoring wells, and dewatering wells. Borings include environmental bore holes, elevators, and vertical heat exchangers. Permit applications and notifications must be submitted to MDH.

2. Construction of a new well or boring, or modification of the depth of an existing well or boring, may not occur until plans have been reviewed and approved, in writing, by MDH. In addition to the normally required notification or permit application, the plan must include the following information: street address; well or

boring depth; casing type, diameter, and depth; construction method(s), including grout materials and grout methods; pumping rate, and; use.

3. Special well construction and/or monitoring requirements may be imposed on well or boring completion, location, and use in order to protect public health and groundwater quality, and to prevent contaminant migration. These requirements will be based on available knowledge of groundwater contamination and movement near the well site, and the proposed use and pumping rate of the well.

4. Under Minnesota Rules, part 4725.3050, subpart 7, item C.(3) a water-supply well for potable uses must not be completed in a limestone or dolomite unless these geologic units are overlain by at least 50 feet of unconsolidated material or insoluble rock that extends around the well for one mile radius. This rule requirement prohibits completing potable water-supply wells in the Galena limestone, Platteville limestone, and Prairie du Chien group within the designated SWCA.

5. No potable water-supply wells, except as provided in item 6, may be completed within the St. Peter sandstone or the Jordan sandstone within the limits of the city of Spring Grove. Potable water-supply wells within the city of Spring Grove must be completed within the Franconia formation or deeper. For purposes of this SWCA, potable uses include any consumptive or other uses involving human contact, including drinking, cooking, bathing, manufacturing or processing of food, drink, or pharmaceuticals, or to supply water to fixtures accessible to humans.

6. Approval of plans and specifications for construction or modification of a community public water-supply well and of the well site is required by Minnesota Rules, part 4725.5850. The MDH may consider completion of a community public water-supply well in the Jordan sandstone if the system operator/owner can demonstrate that the water delivered to the distribution system meets U.S. EPA Maximum Contaminant Limits (MCLs), either through treatment, blending with other sources, monitoring, or other mechanisms. The MDH regularly monitors public water supplies for contaminants. The MCL for TCE is 5 μg/l.

7. A well used for nonpotable purposes, or a regulated boring may be completed into the Galena limestone, Platteville limestone, St. Peter sandstone, Prairie du Chien group, Jordan sandstone, or deeper bedrock formations, in accordance with Minnesota Rules, Chapter 4725, anywhere within the SWCA, provided that the MDH and MPCA determine that use of the well or boring will not interfere with remediation efforts, cause further spread of contamination, or result in human exposure to contaminants at

concentrations exceeding MCLs levels, Minnesota Health Risk Limits (HRLs), interim recommended exposure limits, or other relevant public health standards.

8. Water-supply wells for potable purposes may be completed in the Jordan sandstone in those areas within the SWCA but outside the city of Spring Grove with the permission of the MDH. Before permission to construct the well is granted, the well owner must agree to pay the MDH for a volatile organic chemical (VOC) analysis on a water sample collected from the well prior to grouting the annulus of the casing. The well contractor must contact the MDH Rochester district office and arrange for district staff to collect a pre-grout sample and send the sample to the MDH laboratory for analysis. The well may not be grouted until analysis of the water sample indicates that contaminant levels are below HRLs or interim recommended exposure limits.

9. If VOC concentrations in the well water exceed interim recommended exposure limits, the contractor and the well owner, at the well owner's expense, have the option of inserting a packer to seal off the Jordan sandstone and having a water sample collected from below the packer for VOC analysis to obtain a representative sample of that aquifer. The contractor must contact MDH-Rochester district staff to arrange for MDH staff to take a sample and to send the sample to the MDH laboratory for analysis. The well may not be grouted until analysis of the water sample indicates that contaminant are levels below HRLs or interim recommended exposure limits.

10. If VOC concentrations exceed the HRLs or interim recommended exposure limits in the pregrout sample or, if performed, in the sample with packer, the contractor must remove the casing, continue drilling the well through the St. Lawrence formation and into the Franconia formation or deeper, install the casing into the Franconia formation or deeper, and grout the annular space around the casing from the bottom of the casing to the surface with neat cement.

11. For a water-supply well completed within the Jordan sandstone, the casing must extend a minimum of 10 feet into the formation.

12. If VOC testing indicates the presence of any VOC below HRLs or interim recommended exposure limits, the well owner must test the well again for VOC's one year following completion of the well. Samples must be analyzed by a laboratory certified by the MDH under Minnesota Rules, Chapter 4740. The well owner must report the results to the MDH Rochester district office within 30 days of receipt of the test results.

13. Well and boring construction or reconstruction will not be approved if the MDH, in consultation with the MPCA, concludes that the proposed construction or reconstruction and the well use will interfere with remediation efforts, cause further spread of contamination, or result in human exposure to contaminants at concentrations exceeding MCLs, HRLs, interim recommended exposure limits, or other relevant standards.

14. Completion of wells and borings in bedrock formations below the St. Lawrence formation is allowed without any VOC testing requirement.

15. No well or boring in bedrock may be permanently sealed until after MDH has reviewed and approved, in writing, the plans for the proposed sealing. In addition to the required notification, the plan must include the following information: street address; original well/boring depth; current well/boring depth (if different); casing type(s), diameter(s), depth(s); methods of identifying and sealing any open annular space; methods for identifying and removing any obstructions; grout materials and grouting methods.

16. All provisions of Minnesota Rules, Chapter 4725, are in effect.

PERSONS TO CONTACT

For additional information regarding this SWCA, please contact Mr. Michael Convery of the MDH at 651/201-4586.

Plans for construction, modification, or sealing of wells and borings within the SWCA must be submitted to:

Mr. Chris De Mattos
Minnesota Department of Health, Rochester district office
18 Woodlake Drive Southeast
Rochester, Minnesota 55904
Chris.demattos@health.state.mn.us

Notifications for either construction, modification, or sealing of wells must still be mailed or faxed to the MDH central office at:

Minnesota Department of Health
Well Management Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975
Fax Number: 651/201-4599

For information regarding health effects, please contact:

Ms. Rita Messing
Minnesota Department of Health
Site Assessment and Consultation Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975
Rita.messing@health.state.mn.us

For information regarding the investigation, monitoring, and remediation of the Spring Grove groundwater contamination site, please contact:

Mr. Dan Card
Minnesota Pollution Control Agency
Remediation Division
Superfund Section
520 Lafayette Road North
St. Paul, Minnesota 55155-4194
Phone: 651/297-8379
Dan.card@pca.state.mn.us

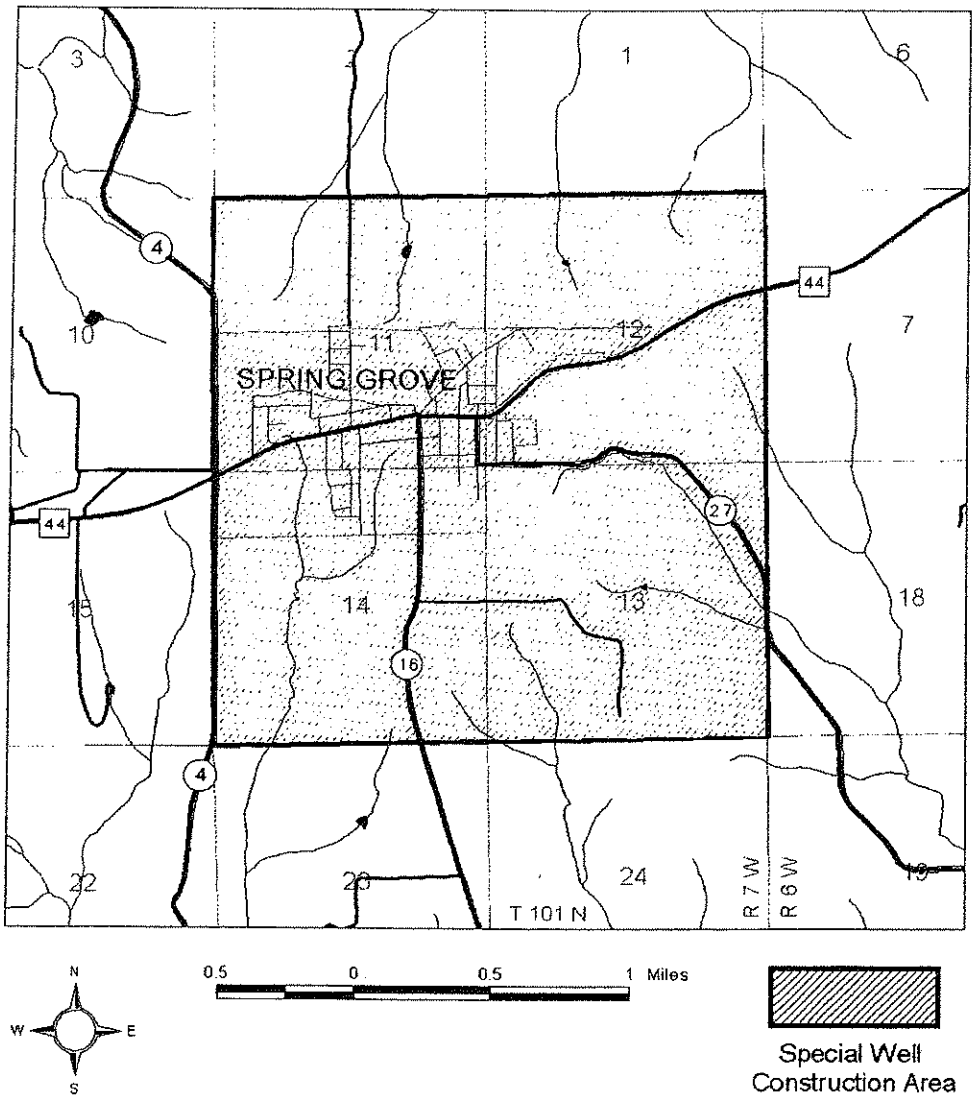
REFERENCES

Gannett Fleming, Inc., 2006, 2005, 2004 Annual Monitoring Report for Spring Grove, Minnesota, Site, 34p.

JLS:MPC:jmw
cc: Dan Card, MPCA

Figure 1

Special Well Construction Area
Spring Grove, Houston County



01 Feb 06 Minnesota Department of Health - Well Management Section