



Minnesota Board of Water and Soil Resources.
Minutes.

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6/22/94

**BOARD OF WATER AND SOIL RESOURCES
ROOM 112, STATE CAPITOL
75 CONSTITUTION AVENUE
ST. PAUL, MINNESOTA 55155
JUNE 22, 1994**

APPOINTED MEMBERS PRESENT: Jim Nielsen, Barb Uppgaard, Barb Cobb, Ted Lovdahl, Warren Rodning, Dwain Otte, Glenn Annexstad, Howard Peterson, Kathleen Roer, and Marvell Tripp .

APPOINTED MEMBERS ABSENT: Jim Rossman and Tim Hvidsten.

AGENCY MEMBERS PRESENT:

Fred Bergsrud, Minnesota Extension Service (MES)
Wayne Anderson, Pollution Control Agency (PCA)
Paul Burns, Minnesota Department of Agriculture (MDA)
Wayne Edgerton, Department of Natural Resources (DNR)
Kim Benson-Johnson, Minnesota Department of Health (MDH)

OTHERS PRESENT:

Dan Livdahl, Minnesota Association of Conservation District Employees (MACDE)
Russ Ruud
D'Wayne DeZiel, Minnesota Association of Soil and Water Conservation District (MASWCD)
Franklin Denn, Minnesota Association of Townships (MAT)

STAFF:

Ron Harnack
Doug Thomas
Greg Larson
Wayne Zellmer
Jim Birkholz
Mary Jo Anderson

Chairman Nielsen called the meeting to order at 9:05 a.m.

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94-31

Adopt Agenda - Moved by Peterson, seconded by Cobb, to adopt the agenda as presented.

Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

Chairman's Report - Chairman Nielsen stated that a meeting has been scheduled for June 27 with Elton Redalen, commissioner of Department of Agriculture, Rod Sando, commissioner of Department of Natural Resources, Chairman Nielsen and Jim Birkholz to review the Interagency Work Group's draft issue position paper for the 1995 Federal Farm Bill. Chairman Nielsen asked members to comment to the BWSR committee members (Dwain Otte, Glenn Annexstad and Jim Rossman).

Chairman Nielsen reported that legislative auditors are at the BWSR office in St. Paul conducting a audit of agency programs and activities. Their report and recommendations are expected in September.

Chairman Nielsen attended the Environmental Quality Board meeting.

Minutes of May 25, 1994 - Ron Harnack stated that a correction needs to be made on page three, regarding the state wetlands program update. It should state, "BWSR requests, within 30 days, a county resolution regarding their intent to adopt the WCA; and the county allocate the minimum \$5,000 to SWCDs." Moved by Cobb, seconded by Lovdahl, to

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94-32

minutes of May 25, 1994, as corrected. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

Committee Reports

Dispute Resolution Committee (DRC) - Kathy Roer reported that the Renville County appeal is settled; a revised permit has been issued by the Buffalo Creek Watershed District.

Soils Committee - Glenn Annexstad stated that a report will be made to the full BWSR at the July meeting.

Education Committee - Barb Cobb said that a meeting has been scheduled for July 28 in Brainerd.

Executive Director's Report - Ron Harnack said that wetlands has been a hot topic again this month; very busy due to construction season. He asked members to review the BWSR's strategic plan as we begin program assessment.

Wetlands Adoption Status - Ron Harnack said that Marshall, Beltrami, Koochiching, Pennington, and Lake counties have not adopted the Wetland Conservation Act. A letter was sent to the counties on June 3 stating that the deadline date is July 5 for counties to resolve this issue of funding. If adoption is not made by July 5, BWSR directs staff to send appropriate letter for action to be taken. Ted Lovdahl said some counties are meeting on July 11, and feels BWSR action should wait until after that date. Moved by Lovdahl,

seconded by Uppgaard, that if Lake County does not adopt the WCA, the Lake SWCD should directly receive a grant of \$5,000 for WCA implementation. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

94-34** Moved by Otte, seconded by Roer, that if no positive response is received from counties by July 5, staff directed to send letter to counties requesting they return \$5,000 to BWSR; this is the wetland portion only of the natural resource block grant. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

94-35** Moved by Lovdahl, seconded by Cobb, to direct staff to send letter to counties that have not given funds to SWCDs. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

Chairman Nielsen called for a break in the meeting at 10:00 a.m. The meeting reconvened at 10:20 a.m.

Cost-Share; General Services; Reinvest In Minnesota (RIM) Services; Special Projects; and Streambank, Lakeshore, and Roadside (SLR) Grants Allocation - Wayne Zellmer explained the allocations as recommended by staff. Chairman Nielsen asked if staff had reconsidered withholding allocations to Marshall, Beltrami, Pennington, and Koochiching pending their adoption of the WCA. Harnack said that projects would be delayed if that is done. Moved

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94-36

by Rodning, seconded by Lovdahl, to approve the staff recommendations on the proposed FY95 grant allocations. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried. Barb Cobb thanked Wayne for his time and good information that members received on the allocation process.

Cost-Share Allocation Formula Change Request of MASWCD - Wayne Zellmer; Russ Ruud, MASWCD Cost-Share Committee; and D'Wayne DeZiel, MASWCD discussed the cost-share committee's concerns in developing the allocation process. Discussion followed. Chairman Nielsen appointed a committee (Barb Cobb, Barb Uppgaard, Dwain Otte, Marv Tripp, and Howard Peterson) to meet with D'Wayne DeZiel, Russ Ruud, and Wayne Zellmer and come before the full BWSR at the July meeting with status report and make a recommendation at the August BWSR meeting.

Minnesota Association of Soil and Water Conservation Districts (MASWCD) Report: D'Wayne DeZiel stated that a "Stable Funding Conference" has been scheduled for August 9 in St. Cloud to develop a plan of action to get funding through the legislature at the next session. D'Wayne stated that the "Farmer Magazine" suggested that an award be given for "Soil and Water Conservation District of the Year"; a conservationist at each area be recognized; and a Northwest Sportsman Award be given at a statewide and area level. D'Wayne said that the Board of Directors' meeting is June 28 in Alexandria. Chairman Nielsen authorized Barb Cobb to attend the MASWCD Board of Directors meetings.

Local Water Planning Rule Revision - Doug Thomas stated that staff recommends that BWSR endorse the revision of the permanent rules for Comprehensive Local Water Planning. Staff also recommends that the BWSR authorize the executive director to sign all pertinent documents related to the promulgation of a rule revision of the permanent rules for Comprehensive Local Water Planning (M.R. 9300). Moved by Upgaard, seconded by Lovdahl, to approve staff recommendations. Affirmative: Annexstad, Cobb, Lovdahl, Otte, Peterson, Rodning, Roer, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

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94-37

Per Diem and Expense Policy - Ron Harnack stated that he discussed the BWSR's draft per diem and expense policy with the state auditor's office and they questioned reimbursement for accumulated hours of preparation time for meeting; and authority for travel time. Chair said this policy is done to legitimize official business; and staff who review the expenses of the members can challenge their expenses. Ron said this item will be on the July agenda.

Minnesota Association of Conservation District Employees (MACDE) Report - Dan Livdahl stated that MACDE members will meet in Alexandria for a training session, July 28-30.

Minnesota Association of Townships (MAT) Report - Franklin Denn briefly commented on grants to townships. City/county/townships and their working relationships need to be addressed, possibly legislatively.

Minnesota Association of Watershed Districts (MAWD) Report - Howard Peterson stated that the summer meeting and tour will be held this weekend, June 24-25, in Ortonville in

the Big Stone Lake area. MAWD is developing a policy handbook. Howard distributed a fact sheet and fishing bobbers to celebrate the 25th anniversary of the Riley Purgatory Bluff Creek Watershed District.

1994 BWSR Meeting Schedule:

July 27-28; Board meeting and tour in Brainerd

August 24; Board meeting at the Capitol

September 28-29; Board meeting and tour, metro region

October 26; Board meeting at the Capitol

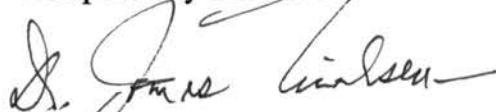
December 7; Board meeting at the Capitol

Barb Uppgaard briefed members on the tour of Cass and Crow Wing counties on July 27 and the board meeting on July 28.

1995 Farm Program Issues - Jim Birkholz distributed the interagency work group's draft of Guiding Principles for Agriculture and Conservation Provisions of the 1995 Federal Farm Bill for review and comment.

Chairman Nielsen adjourned meeting at 12:40 p.m.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "D. James Nielsen", written over a horizontal line.

D. James Nielsen

Chairman

COMPREHENSIVE LOCAL WATER PLANNING PROPOSED RULE REVISION

ISSUE:

In the last four years the legislature has passed a number of bills which require the BWSR to revise the permanent rules for Comprehensive Local Water Planning. Also since all greater Minnesota counties have completed water plans, revision of the current rules to provide more guidance on plan updates is warranted.

BACKGROUND:

In 1985 the Minnesota Legislature authorized counties in greater Minnesota to prepare and adopt comprehensive local water plans. The intent behind this legislation was to legitimize the role of counties in the planning and implementation of local water resource protection and management efforts. Rules were adopted in 1987 as directed by statute to provide guidance to counties on what was to be included in a plan.

It was not until 1987 that counties actively began to participate in developing county water plans. These early efforts were tied to a LCMR funded pilot local water planning project which provided grants to 56 counties. In 1989 the legislature, as part of the groundwater protection act, provided long term funding to the BWSR to provide grants to counties for both plan development and plan implementation. It was at this time that the remaining counties in greater Minnesota began the water planning process.

To date all but one greater Minnesota county has a state approved and locally adopted plan. Koochiching County, the one remaining county, is developing a plan and expects to have it adopted by the end of 1994. All but two water plans will be revised/updated during 1995.

The required revision of local water plans in 1995 along with the legislative actions listed below necessitate that BWSR consider a revision of the local water planning rules at this time.

1989 - Groundwater Protection Act. This act included a requirement that water plans developed after 1990 must include objectives for sensitive groundwater areas and well head protection.

1991 - Water Retention. This legislation requires that local water plans developed or amended after 1991 must specify controls that utilize the best available technology to minimize off-site stormwater runoff, maximize overland flow and flow distances over surfaces covered with vegetation, increase on-site infiltration, replicate predevelopment hydrologic conditions as nearly as possible, minimize off-site discharge of pollutants to ground and surface water, encourage natural filtration functions, and reduce mosquito breeding habitat.

1991 - Wetland Conservation Act. This legislation requires that counties must identify high priority wetland areas in their comprehensive local water plan.

In addition to the required statutory changes to the rule the following items are also being proposed:

- 1) Addition of a definition for "major watershed"
- 2) Reorganization of the required data and assessment section to separate the assessments from the data elements.
- 3) Addition of a requirement for the plan to include a discussion of the roles and responsibilities of each local unit of government in the county.
- 4) Adds a preliminary review period for state agencies concurrent with the 60 day required local review.
- 5) Adds a minor amendment procedure to the rule.

STAFF RECOMMENDATION:

Staff recommends that the Board endorse the revision of the permanent rules for Comprehensive Local Water Planning (M.R. 9300).

Staff also recommends that the Board move to authorize the Executive Director to sign all pertinent documents related to the promulgation of a rule revision of the permanent rules for Comprehensive Local Water Planning (M.R. 9300).

h:rulrev.sum/djt

Celebrate Clean Water

Lake Riley Water Quality Study: 1970 - 1972 • **Hyland Water Quality Lake Study:** 1972-1973 Cooperative project with the Hennepin County Park Reserve District • **T.H. 7-T.H. 101 Floodplain Study:** 1973 and 1975 • **Purgatory Creek Corridor Study:** 1973 Cooperative project with the Cities of Eden Prairie and Minnetonka

• **Stream Gauge:** 1975 Cooperative project with the Minnesota Department of Natural Resources • **Hyland Lake Water Quality Improvements-EPA Clean Waters Grant:** 1977 Cooperative project with the Hennepin County Park Reserve District, City of Bloomington and EPA • **Lake Riley Park Land Acquisition:** 1976 Cooperative project with the City of Eden Prairie •

Purgatory Creek Park Land Acquisition: 1976 Cooperative project with the City of Minnetonka • **Lund Property Land Acquisition:** 1977 Cooperative project with the City of Eden Prairie • **Kelly Property Land Acquisition:** 1977 Cooperative project with the City of Eden Prairie • **Boomer Property Land Acquisition:** 1977 Cooperative project with the City

of Eden Prairie • **Round Lake Water Quality Improvements:** 1977, 1980, 1985 Cooperative projects with the City of Eden Prairie and the Minnesota Department of Natural Resources • **T.H. 101 Storm Water Management Improvements:** 1979 Cooperative project with the City of Minnetonka

and Minnesota Department of Transportation • **Erie Avenue-Chain View Storm Water Quality Improvements:** 1981 Cooperative project with the City of Chanhassen • **Staring Lake Water Quality Study:** 1983 Cooperative project with the City of Eden Prairie • **Round Lake Pumped Outlet Analysis:** Cooperative project with the City of Eden Prairie • **Lake Riley Water Quality Improvements:** 1987 Cooperative project

with the cities of Eden Prairie, Chanhassen, Minnesota Department of Natural Resources and EPA • **Eden Prairie Chain of Lakes Outlet Project:** 1985-1987 Cooperative project with the City of Eden Prairie • **Purgatory Creek Recreation Area Staring Lake Outlet:** 1983 - Present Cooperative project with the City of Eden Prairie

25
Years of
Accomplishment



**Riley
Purgatory
Bluff Creek
Watershed District**

8300 Norman Center Drive Ste 300 Bloomington, MN 55437 (612) 832-2600

Water-Aware Lawn Care

Little things – like lawn care – can greatly affect water quality. Water-aware lawn care may be the most important thing city dwellers can do to improve the water quality of lakes, streams, wetlands and ground waters.

Who can help: You can. If you own property, you can begin water-aware lawn care today. If you live in an apartment or townhouse, check with your building manager or association to encourage use of water-aware lawn care practices.

What pollutes: In cities and suburbs the main polluters are soil erosion, organic matter and inappropriately applied fertilizers.

What you can do

Mowing: Leave clippings on the lawn. Don't let lawn clippings fall or blow onto sidewalks, streets or driveways. With the first rain they can wash them into waterways. The natural phosphorus in clippings makes a good fertilizer for the lawn, but in water fertilizer means more algae – which no one wants.

Leaves, and other plant debris should be removed as soon as possible from street gutters, sidewalks, and driveways and when mowing lawns.

Pets: Remove pet feces from sidewalks and streets to prevent them from washing into waterways where they will increase bacterial contamination and nutrient levels.

Roof Downspouts: Direct downspouts to places that can absorb water – lots of it. Avoid hard surfaces like driveways and erodible or unplanted surfaces.

Fertilizing: Be absolutely sure you need to fertilize. Nitrogen and phosphorous fertilizers pose serious problems to water quality so have your soil tested first – then *follow* the recommendations. After fertilizing, water your lawn but do not allow the water to run off into streets, driveways, or any body of water. Promptly remove *any* spilled fertilizer. Never apply fertilizer to frozen ground.

If you really must fertilize be absolutely sure *no* fertilizer gets into nearby water ways.

Loose Soil: Erosion, even on small areas should be prevented. Secure loose soil with hay bales or silt fences and replant as soon as possible

Buffer Zones: On land adjacent to lakes, streams, or wetlands – leave a buffer zone between any landscaped, mowed, or fertilized areas and the water. The buffer zone should not be exposed or erodible soil. It should include managed grasses or natural vegetation. A slight hump constructed in the ground, near and parallel to the shoreline is recommended.

GUIDING PRINCIPLES FOR AGRICULTURE AND CONSERVATION PROVISIONS OF THE 1995 FEDERAL FARM BILL

State of Minnesota Interagency Work Group

Agriculture has been, is and will continue to be a primary contributor to America's economic and social health. Today's paramount challenge to agriculture and federal farm policy is to provide a safe and abundant supply of food and fiber, healthy farm economies, vigorous overall economies and healthy natural environments. This would manifest a truly sustainable agricultural system - an absolutely essential goal for the long-term health of our nation.

Farmers are our most significant and important land managers. Recognizing this key role, and with society's willingness to fund protection of agricultural lands for future generations, a farm program must be crafted that protects public interests within the constraints of private property rights. Therefore, we assert that national agricultural policy must be refocused to primarily aid and reward farmers who manage land in an environmentally sound manner.

In order to stabilize supplies and prices, and, in return, farm income, current federal farm programs transfer public revenues to the private agricultural sector through the vehicle of commodity control. The 1985 Food Security Act made a dramatic shift by linking environmental protection requirements to eligibility for program payments, a concept which is referred to as "conservation compliance". The 1990 Food, Agriculture, Conservation and Trade Act strengthened the conservation compliance feature. Continuing this trend, we should make a transition toward a stewardship-based rather than a commodity-based payment system. A stewardship-based system should reward farmers who employ management practices that provide societal benefits such as protecting our land and water from long term degradation. Incentives must be offered to offset the economic and weather related risk factors that often prevent farmers from making management decisions which protect land and water. A stewardship-based system would provide farmers the freedom to select which crops to plant based on profitability and soil capability rather than commodity crop program acreage mandates. This system should be based on building up and maintaining soil quality, preventing both on and off site pollution at its source and would encourage appropriate reclamation and maintenance of wild plant and animal communities to insure recreational and economic uses. New tracking systems to objectively and fairly determine farm compliance with a stewardship based system must also be developed. Compliance should be determined based on meeting standards, allowing creativity and flexibility, not on a rigidly prescribed set of practices.

The societal focus of the federal farm program should be to maintain a substantial number of farmers as, and to help beginning farmers be, owner operators. Environmental protection goals can best be met by private farmers who are equipped to make good management decisions for their farms in the context of a farm bill which provides incentives for good stewardship. The most motivated stewards are those who have a stake in the outcome of their decision-making. Having farmers who both own and operate their farming operations is vital to good nationwide stewardship.

The federal farm bill should be consistent with other federal environmental protection laws. The farm bill should contain the "means" to accomplish the environmental goals spelled out in parallel legislation such as the Clean Water Act, Safe Drinking Water Act, Endangered Species Act and others. This process will continue to build upon the working relationships farmers have built with government through the various programs contained in "farm bills" over the years. Farmers should be involved in policy discussions, setting of standards and goals and other aspects of implementing future federal farm policy.

Program Features

Features of a program necessary to begin the task of accomplishing these objectives are:

1. **The implementation of whole farm natural resource management plans should be required for producers to receive program payments (stewardship payments).** This system should be phased in over an agreed-to number of years in order to phase out the use of commodity crop bases to determine payments. Early in the transition, payments would be commodity based, phasing to a combination of commodity and stewardship payments, then becoming totally based on stewardship. Plans should incorporate profitability and farm family quality of life, while attaining environmental

protection. Whole farm management plans should be designed around the concept of watershed based management. The plans should focus on: conserving and enhancing soil quality as a fundamental first step to environmental improvement; increasing nutrient, pesticide and irrigation use efficiencies; making erodible lands more resistant to erosion and runoff; and, making greater use of field and landscape buffer zones where appropriate along streams, rivers, drainage systems, lakes and wetlands. Plans should result in environmental protection and enhanced fish and wildlife habitat. USDA should take the lead to develop methods to monitor the results of whole farm management plan implementation.

2. Shift set aside programs from annual to multi-year options and blend them with land retirement programs such as the Conservation Reserve Program and Wetland Reserve Program to more comprehensively accomplish whole farm natural resource management objectives as well as meet commodity supply control targets of the federal government. Cropland most sensitive to environmental damage should be the target of long-term or permanent retirement. A full range of options should be developed for this initiative which includes short and long term contracts and easements (terms could vary from limiting certain uses to complete protection).

3. Broader opportunities for input should be built into the decision-making process at all levels of delivery of federal farm programs. Local, state and federal government, environmental organizations, sporting groups and others should be consulted on a regular basis by the decisionmaking bureaucracy of federal farm programs.

4. The federal government should provide block grants to states to implement many of the environmental goals of the farm bill. In the past two decades state and local governments have vastly increased their staff and budgets directed toward farmland conservation issues. A system of block grants would foster a true partnership between federal, state and local governments and result in more coordination of program delivery to farmers. Such an initiative should include incentives for states to establish programs and capabilities where they do not exist. Such a process has been shown to be effective for other federal programs such as US Forest Service grants to state forestry agencies, and EPA grants to states under both the Clean Drinking Water Act and the Clean Water Act (Sec. 319 grants for nonpoint source pollution control).

In addition, block grants could help develop and refine regulations which would be implemented by state and local governments to deal with severe erosion or water quality problems. Farmers who demonstrate good stewardship should not be penalized for problems caused by those farmers who choose not to. Federal agencies should support local and state enforcement efforts which provide for statewide framework approaches but allows adjustments to local geographic conditions.

5. Agricultural research and information and education efforts should be directed toward sustainable agriculture practices. Sustainable agriculture in this context consists of farming systems which provide sustained economic return to the producer while also emphasizing long term stewardship which results in environmental protection. Development and adoption of sustainable agriculture systems should be encouraged by grants, cost sharing and other appropriate incentives.

6. International trade agreements which involve agricultural commodities should require all participating nations to adopt similar land and water stewardship goals.

Ford Runge

Summary

To accomplish the goals of this program, it will be essential to begin the transition from program payments based on commodities to payments based on stewardship. After more than sixty years of commodity based payments, the transition will not be without complications. Nor should it happen suddenly. Rather it should be made in increments over the course of several years. This way, innovations can be tried, adjustments can be made and farmers can gradually become accustomed the shift. Economic incentives for stewardship must remain at sufficiently high levels to ensure widespread participation of landowners in the program.

The fact that the costs of managing cropland in an environmentally sensitive manner are so much less than the costs of cleaning up damage which results from poorly managed cropland, make it imperative for Congress to adequately fund the next farm bill. Failure to do so will leave a legacy of environmental damages to be corrected by future generations. By using the farm bill as the vehicle to promote stewardship based farming, we can embrace the opportunity to bring together profitable crop and livestock production with watershed and ecosystem based farm management to achieve the nation's goals of a vigorous economy and quality environment.

Board of Water and Soil Resources

Adopted Permanent Rules Relating To Comprehensive Local Water Planning

Rules as Adopted.

9300.0010 DEFINITIONS.

Subpart 1. **Applicability.** The definitions in this part and in Minnesota Statutes, section ~~110B.02~~ 103B.305 apply to parts 9300.0020 to 9300.0210.

Subp. 2. **Geographic indicator.** "Geographic indicator" means latitude and longitude; universal transverse mercator coordinates (UTM's); or township, range, section, and 40-acre parcel.

Subp. 3. **Local units of government.** "Local units of government" means municipalities, towns, counties, soil and water conservation districts, organizations created for the joint exercise of powers under Minnesota Statutes, section 471.59, and other special purpose districts or authorities exercising authority in water and related land resources management at the local level.

Subd 4. **Major Watershed.** "Major Watershed" means the 81 major watershed units delineated by the map "State of Minnesota Watershed Boundaries - 1979" as produced by the Minnesota Department of natural Resources, Office of Planning and Research, Water Policy Planning Program, with funding from the Legislative Commission on Minnesota Resources.

Subp. 45. **Minor watershed unit.** "Minor watershed unit" means each of the approximately 5,600 minor watershed units of surface water drainage delineated on the state watershed boundaries map prepared pursuant to the requirements of Laws of Minnesota 1977, Chapter 455, section 33, subdivision 7, paragraph (a) and the accompanying data base, and revisions of that data base. by the map "State of Minnesota Watershed Boundaries - 1979" as produced by the Minnesota Department of Natural Resources, Office of Planning and Research, Water Policy Planning Program, with funding from the Legislative Commission on Minnesota Resources.

Subp. 56. ~~Protected waters.~~ **Public waters.** "Protected waters" "Public waters" means

2
3 Adopted Permanent Rules Relating To Comprehensive Local Water Planning
4

5 Rules as Adopted.

6 9300.0010 DEFINITIONS.

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24 ~~watershed boundaries map prepared pursuant to the requirements of Laws of Minnesota~~
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26 ~~and revisions of that data base;~~ by the map "State of Minnesota Watershed Boundaries -
27 1979" as produced by the Minnesota Department of Natural Resources, Office of Planning
28 and Research, Water Policy Planning Program, with funding from the Legislative
29 Commission on Minnesota Resources.

30 Subp. 5~~6~~. ~~Protected waters.~~ **Public waters.** "Protected waters" "Public waters" means

1 ~~those waters of the state identified as defined in public waters or wetlands under Minnesota~~
2 ~~Statutes, section 105.37, subdivision 14 or 15, or section 105.391, subdivision 1. section~~
3 ~~103G.005, subdivision 15, and inventoried under Minnesota Statutes, section 103G.201.~~

4 Subp. 7. Public Waters Wetlands. "Public waters wetlands" means wetlands as defined
5 in Minnesota Statutes, section 103G.005, subdivision 18.

6 Subp. 68. State board. "State board" means the Minnesota ~~Water Resources board~~
7 Board of Water and Soil Resources created by Minnesota Statutes, ~~section 105.71,~~
8 ~~subdivision 1. section 103B.101.~~

9 Subp. ~~7.~~ 9. Watershed management organization. "Watershed management
10 organization" has the meaning given in Minnesota Statutes, section ~~473.876, subdivision 9.~~
11 103B.205, subdivision 13.

12 PURPOSE AND PROCEDURE OF PLANNING

13 9300.0020 PURPOSES OF PLANNING PROCESS AND SCOPE OF PLAN.

14 Subpart 1. Purposes. The purposes of a comprehensive water plan are to:

15 A. identify existing and potential problems and opportunities for the
16 protection, management, and development of water and related land resources; and

17 B. develop objectives and carry out a plan of action to promote sound
18 hydrologic management of water and related land resources, effective environmental
19 protection, and efficient management.

20 Subp. 2. Scope. In order to gain sufficient understanding of existing natural features
21 and other phenomenon that serve as the basis for a comprehensive water plan, the county
22 must assemble available information about the physical environment and the surface water,
23 ground water, and related land resources. Information is relevant for inclusion in the plan
24 if it provides the basis for understanding a county's present or future water-related
25 opportunities or problems that are or will be faced by a county.

26 After collecting the required information, the county must determine the implications
27 of the information for present and future land and water use, assess those implications, and
28 identify opportunities and problems based on this assessment. The county must then develop
29 its goals, objectives, and plan of action for
30 addressing the identified problems and opportunities.

1 Subpart 3. Principles. A comprehensive water plan must conform to the following
2 principles:

3 A. Sound hydrologic management of water:

4 (1) significant upstream and downstream effects on surface water, and
5 up-gradient and down-gradient effects on ground water, of actions impacting water and
6 related land resources should be fully considered;

7 (2) natural water storage and retention systems should be preserved and
8 used to the maximum extent practical;

9 (3) water management decisions should be based on sound data and
10 technical analysis;

11 (4) interrelationships between surface and ground water, land and water
12 use, and quality and quantity of water should be recognized; and

13 (5) potential variations in precipitation, both short-term and long-term,
14 should be fully considered.

15 B. Effective environmental protection:

16 (1) potential cumulative effects of proposed actions should be
17 considered;

18 (2) prevention of potential water and related land resources problems
19 should be emphasized;

20 (3) the overall quality of the environment should be protected or
21 enhanced; and

22 (4) public health and safety should be protected or enhanced.

23 C. Efficient management:

24 (1) the total benefits of water programs and projects should not exceed
25 the total costs;

26 (2) water management programs should be adequately funded to
27 achieve high-priority objectives;

28 (3) comprehensive water planning should be coordinated with other
29 related planning programs to fill management gaps and minimize duplication of effort;

30 (4) comprehensive approaches to identified problems and opportunities

1 should be considered; and

2 (5) water conservation practices should be used to the maximum extent
3 practical.

4 **9300.0030 PROCEDURES FOR WATER PLANNING.**

5 Subpart 1. **Applicability.** A county board that decides to develop or revise a
6 comprehensive water plan under Minnesota Statutes, ~~chapter 110B~~ section 103B.301 shall
7 use the procedures provided in this part to facilitate public participation and
8 intergovernmental coordination.

9 Subp. 2. **Resolution to develop or revise plan.** A county board deciding to develop
10 or revise a comprehensive water plan must adopt a resolution requiring the development
11 or revision of a plan.

12 Subp. 3. **Notice of decision to develop or revise plan.** Within 30 days after adoption
13 of a resolution requiring the development or revision of a comprehensive water plan, the
14 county shall send notice of its decision to develop or revise a plan to:

15 A. the county boards of contiguous counties;

16 B. the governing bodies of counties, watershed districts, and watershed
17 management organizations that have jurisdiction in each major watershed unit wholly or
18 partly within the county;

19 C. the governing bodies of all local units of government wholly or partly within
20 the county;

21 D. the regional development commission, if any; and

22 E. the state board.

23 Upon receipt of the resolution, the state board shall notify each of the agencies
24 identified in part 9300.0170, subpart 2 and any other agency the state board deems
25 appropriate.

26 Subp. 4. **Request for local plans and official controls.** Within 30 days after adoption
27 of a resolution requiring the development or revise of a comprehensive water plan, the
28 county shall request from all local units of government having jurisdiction within the county
29 the following information:

30 A. any existing water and related land resources plans and official controls;

1 and

2 B. any conflicts, problems, or opportunities that those local units of
3 government want examined and addressed in the comprehensive water plan.

4 The information must be submitted within 60 days of the county board's request.

5 Subp. 5. **Public informational meeting required.** Within 90 days of the notice required
6 in subpart 3, the county board shall hold a public informational meeting. At the meeting,
7 the county board should solicit information about issues, problems, and opportunities to be
8 considered in the plan. The county shall publish notice of the meeting in the official
9 newspaper of the county at least ten days but not more than 30 days before the meeting.
10 The county also shall notify the groups identified in subpart 3 at least 30 days before the
11 meeting.

12 Subp. 6. **Meetings with local units of government within the county.** The county board
13 adopting the resolution shall conduct meetings with local units of government exercising
14 authority in water and related land resources management within the county during ~~the plan~~
15 preparation or revision of the plan, and implementation.

16 Subp. 7. **Public participation process.** The county board developing or revising a
17 comprehensive water plan shall ensure that there is a process for public participation during
18 plan development or revision ~~and as well as~~ implementation of the plan.

19 Subp. 8. **Record of meetings.** A county must maintain a record of each meeting held
20 under subparts 5, 6, and 7. The record shall include minutes and a list of the people in
21 attendance and who they represented.

22 Subp. 9. **Delegation.** The county board is responsible for the comprehensive water
23 plan, but may delegate all or part of the preparation or revision of the comprehensive water
24 plan to a local unit of government, regional development commission, or a resource
25 conservation and development committee that is willing to carry out this assignment. If a
26 county delegates all or part of the comprehensive water plan preparation or revision, it must
27 ensure that public meetings are recorded and that there is a process for public participation
28 in the preparation or revision of the plan.

29
30 **CONTENTS OF A COMPREHENSIVE WATER PLAN**

1 **9300.0035 EXECUTIVE SUMMARY.**

2 Each comprehensive water plan must have a section entitled "Executive Summary."
3 The executive summary should outline the purpose of the comprehensive water plan; the
4 membership on any task force or advisory board; a brief history of the planning process; and
5 a summary of the goals, problems, and proposed potential solutions.

6 **9300.0040 DATA CONSISTENCY WITH ~~STATE PLANNING AGENCY~~ MINNESOTA**
7 **PLANNING, LAND MANAGEMENT INFORMATION CENTER GUIDELINES.**

8 Data collected after November 15, 1986 ~~the effective date of parts 9300.0010 to~~
9 ~~9300.0210~~ for a comprehensive water plan must follow the guidelines for consistency
10 established by the Minnesota ~~State planning Agency~~ Planning, Land Management
11 Information Center . To assure consistency, this data must include a geographic indicator.

12 Data must also be coded using recommended standard identifiers, where available.
13 Standard identifiers are: the Minnesota unique well number for wells and the ~~protected~~
14 public waters inventory identification number for surface waters.

15 Consistency of map scales is also recommended, where possible. The information
16 required to be presented in map form by parts 9300.0050 and 9300.0070 may be combined
17 on multiple maps or map overlays.

18 **9300.0050 PHYSICAL ENVIRONMENT, LAND USE, AND DEVELOPMENT.**

19 Summarizing information about the physical environment enables a county to
20 understand the present conditions affecting water and related land resources. At a minimum,
21 the following information about a county's physical environment, land use, and development
22 must be collected. Information must be included in the plan if it provides the basis for
23 understanding a county's present or future water-related opportunities or problems that are
24 or will be faced by the county. ~~included in the comprehensive water plan:~~

25 A. Precipitation:

26 (1) a map or list of the location of precipitation gaging stations in the
27 county;

28 (2) a map showing isolines of normal annual total precipitation in
29 inches; and

30 (3) a map showing isolines of normal total precipitation in inches for

1 the period May through September.

2 B. Geology and water resources:

3 (1) a map or description of important aquifers ~~systems~~, confining layers,
4 and groundwater flow characteristics to the extent known;

5 (2) a description of groundwater and surface water interconnections,
6 such as recharge and discharge areas, where they are known;

7 (3) a map or description of groundwater sensitivity to pollution;

8 ~~(34)~~ a map of boundaries and flow directions of major watershed units
9 and minor watershed units; ~~and~~

10 ~~(45)~~ a map of state ~~protected~~ public waters and ~~public drainage ditches,~~
11 ~~including the location of any existing dams and control structures;~~

12 (6) a map of public drainage systems; and

13 (7) a map of public dams and control structures.

14 C. Soils:

15 (1) a general soils maps and description of soils infiltration
16 characteristics; and

17 (2) a map of erosion prone soils.

18 D. Map of original vegetation.

19 E. Description of general topographic relief of major watershed units based
20 on United States Geological Survey topographic maps.

21 F. Land use and public utility services:

22 (1) a general map of existing land uses;

23 (2) a map showing the areas served by storm sewers, sanitary sewers,
24 and public water systems; and

25 (3) a map or list by geographic indicator showing the location of
26 community public water supply intakes and wells, and a map of the wellhead contribution
27 area if known.

28 G. Land ownership:

29 (1) a map showing the ownership of local, state, federal, and Indian
30 tribal lands; and

(2) a map showing lands with easements that relate to water resources, where that information is available.

9300.0060 EXPECTED CHANGES TO PHYSICAL ENVIRONMENT, LAND USE, AND DEVELOPMENT.

A comprehensive water plan must identify expected changes in the physical environment, land use, and development described in part 9300.0050. Information that may be used to predict changes include population projections, comprehensive plans, official controls, state and federal regulations, and plans for road, water, and sewer extensions. Expected changes that must be included in the plan are expected changes to land use and cover; expected changes in public utility services; and other expected changes potentially affecting water resources.

9300.0070 SURFACE WATER, GROUND WATER, AND RELATED LAND RESOURCES.

Subpart 1. Applicability. ~~Summarizing~~ Collecting and summarizing information about the surface water, ground water, and related land resources, enables a county to characterize its water and related land resources, and to identify problems and opportunities. The level of detail should be determined in conjunction with neighboring counties, based on the information available, the extent and use of the resource, and the degree to which problems and opportunities are identified. The information should be listed by watershed unit and ground water systems where appropriate. At a minimum, information collected about existing county resources must include the information required by subparts 2 to 5, when that information is available. Information must be included in the plan if it provides the basis for understanding a county's present or future water-related opportunities or problems that are or will be faced by the county. Information not presented in the plan must be identified and maintained in a data repository in the county.

Subpart 2. Water quantity information. ~~The following information about water quantity must be included in the plan:~~

A. Surface water:

(1) a map of known surface water gauging stations;

(12) a description of high, mean, and low flows on streams a discussion of lakes and streams with high or low water problems;

(23) a list of lakes where the state has established ordinary high water marks;

(34) a list of permitted withdrawals from lakes and streams, including the location by geographic indicator, source, use, and amounts withdrawn;

(45) a list of lakes and streams in the county for which state protected levels or flows have been established;

(56) a description of known surface water use conflicts, ~~including those caused by ground water pumping that affects surface water~~ resulting from water appropriations or natural conditions; and

~~(6) the implications of surface water quantity information for present and future water and land uses and an assessment of those implications.~~

B. Ground Water:

(1) a list of wells covered by state appropriation permits, including the location by geographic indicator, amounts of water appropriated, type of use, and aquifer source;

(2) a description of known well interference problems and water use conflicts; and

(3) a list of state observation wells located in the county including geographic indicator, unique well number, aquifers measured, years of record, and average monthly levels; ~~and.~~

~~(4) the implications of ground water quantity information for present and future water and land uses and an assessment of those implications.~~

Subpart 3. Water quality information. ~~The following information about water quality must be included in the plan:~~

A. Surface water:

(1) a map or list of the state water quality management classifications for each stream and lake;

(2) a summary of available lake and stream water quality monitoring data; examples of these kinds of data are:

(a) bacteriological contamination indicators (for example, total

coliform counts);

(b) inorganic chemicals (for example, phosphorus, nitrogen, and metals);

(c) organic chemicals (for example, petroleum constituents, pesticides, and organic solvents);

(d) sedimentation (for example, suspended solids);

(e) dissolved oxygen; and

(f) excessive growth or deficiency of aquatic plants;

(3) a summary of information from informal sources relating to surface water quality, such as fish kills; and

~~(4) the implications of surface water quality information for present and future water and land use, and an assessment of those implications.~~

B. Ground water:

(1) a summary of available water quality data, including routinely monitored sites. Examples of data are:

(a) bacteriological contamination indicators (for example, total coliform counts);

(b) inorganic chemicals (for example, nitrate/nitrite and metals concentrations); and

(c) organic chemicals (for example, organic solvents, petroleum constituents, and pesticides).

~~(2) The implications of ground water quality information for present and future water and land uses with emphasis on those with potential health-related impacts and an assessment of those implications.~~

Where possible, the information required in this item should be presented by aquifer groundwater system and geographic area.

Subpart 4. Information on special land uses and conditions that influence water quality and quantity. ~~The following information about special land uses and conditions must be included in the plan:~~

A. Eroding lands:

1 (1) a description or map by major watershed unit of areas where
2 eroding lands are causing sedimentation problems;

3 ~~—————(2) water quality and quantity implications for watercourses, water~~
4 ~~basins, ditches, and wetlands of sedimentation and an assessment of those implications; and~~

5 ~~(3) an assessment by watershed unit of the effects of land use and cover~~
6 ~~on quantity and quality of runoff.~~

7 B. Irrigation:

8 (1) a map or list by geographic indicator of irrigated acreage; and

9 ~~(2) for any county containing more than 1,000 acres of irrigated land~~
10 ~~in any one township, the implications of irrigation for present and future land and water use~~
11 ~~and an assessment of those implications.~~

12 C. Drainage:

13 (1) a map showing the location and type of drainage systems in the
14 county;

15 ~~(2) a table listing the public drainage systems in the county and the~~
16 ~~amounts expended, by year, for repair work on each system; and~~

17 ~~(2) an assessment of any significant water quality and quantity effects~~
18 ~~due to public or private ditch systems; and~~

19 ~~(3) a summary of any known water quality and quantity information~~
20 ~~from engineering reports prepared for ditch establishments, improvements, and repairs in~~
21 ~~the county and any federal, state, or local modeling efforts on ditches in the county.~~

22 D. Pollutant sources:

23 (1) a map or list by geographic indicator of known closed and open
24 sanitary landfills, closed and operating open dumps, and Minnesota Superfund hazardous
25 waste sites and a summary of available water quality information relating to these sites;

26 (2) a map or list by geographic indicator of feedlots, abandoned wells
27 not sealed in accordance with state statutes and rules, underground storage tank sites, and
28 permitted wastewater discharges under Minnesota Rules chapter 7001, and a summary of
29 available water quality information relating to these sites;

30 (3) a list by geographic indicator of facilities that have hazardous waste

1 generator identification numbers; and

2 ~~(4) the implications of pollutant sources for present and future water~~
3 ~~and land uses and an assessment of those implications.~~

4 E. Special geologic conditions:

5 (1) a map of known geologic conditions, such as karst areas, buried
6 valleys, or sand plains that may pose concerns relating to water quality or quantity; and

7 ~~(2) the implications of special conditions for present and future water~~
8 ~~and land uses and an assessment of those implications.~~

9 Subpart 5. Information on related land resources. The following information about
10 related land resources shall be included in the plan:

11 A. Wetlands:

12 (1) maps of wetlands identified under the National Wetlands Inventory,
13 where available;

14 (2) a summary of plans for wetlands with controlled outlets, such as
15 plans for draw downs;

16 (3) a description of wetland regulations affecting county waters
17 including the United States Corps of Engineers, Section 404 permit program, the
18 Swampbuster Provisions of the USDA Food Security Act, the Minnesota Wetland
19 Conservation Act, and the Minnesota DNR Protected Waters Program requirements;
20 ~~affecting county waters; and~~

21 (4) a discussion of the values of the implications of wetlands with
22 consideration for present and future water uses with special consideration for water quality,
23 flood attenuation, wildlife, and recreation; ~~and an assessment of those implications; and~~

24 (5) delineation of high priority areas for wetland preservation,
25 enhancements, restoration, and establishment.

26 B. Floodplains:

27 (1) a list of current floodplain maps and studies which have been
28 adopted for regulatory purposes including any supplemental maps and studies to Federal
29 Emergency Management Agency (FEMA) studies in the county including incorporated
30 areas;

1 (2) a description of floodplain regulations including the Minnesota
2 DNR Floodplain Management Program, the Federal Emergency Management Agency, and
3 watershed districts if applicable;

4 (13) a map showing those areas delineated as floodplain by existing
5 local ordinances or in proposed ordinances that have a due date established by the
6 Minnesota Department of Natural Resources or the Federal Emergency Management
7 Agency;

8 (24) a map of areas with known flooding problems;

9 (35) an estimate of average annual flood damages, if available; and

10 ~~(4) an assessment of the adequacy and enforcement of existing~~
11 ~~floodplain ordinances.~~

12 (6) a description of all potential Minnesota DNR Flood Damage
13 Reduction grant projects in the county including incorporated areas.

14 C. Shorelands:

15 (1) a list of local units of government with approved shoreland
16 ordinances;

17 (2) a list of ~~protected~~ public waters, and their shoreland classifications
18 under Minnesota Statutes, section 105.485; ~~and~~

19 (3) a description of the Minnesota DNR Shoreland Management Act;
20 and

21 ~~(3) an assessment of the adequacy and enforcement of the shoreland~~
22 ~~ordinances.~~

23 D. Water-based recreation lands:

24 (1) a map and description of water oriented recreational resources
25 including those listed in the State Comprehensive Outdoor Recreation Plan;

26 (2) a map of public water accesses;

27 (3) a map and description of state or federally designated wild and
28 scenic rivers and state designated canoe and boating routes; and

29 ~~(4) an assessment of the adequacy of water-based recreational lands for~~
30 ~~present and future use.~~

1 E. Fish and wildlife habitat:

2 (1) a map and description of any state designated wildlife management
3 areas and any lakes with state designated classifications for game or fish management within
4 the county;

5 (2) a map and description of any state designated trout lakes or trout
6 streams within the county;

7 (3) a list and description of the state ecological and management
8 classifications and use attainability for lakes and streams, where available;

9 (4) a list and description of the conclusions and recommendations of
10 biological surveys or reconnaissance studies, where available;

11 (5) a description of state management plans for fish lakes, streams, and
12 wildlife areas, where available; and

13 ~~(6) an assessment of the adequacy of fish and wildlife habitat for~~
14 ~~present and future use.~~

15 F. Unique features and scenic areas:

16 (1) a map or description of unique features and scenic areas with
17 relationships to water including state designated natural and scientific areas, areas
18 containing county, state, and federal rare and endangered species, and other features such
19 as waterfalls, springs, and historic mills; and

20 ~~(2) the implications of unique features and scenic areas for present and~~
21 ~~future water and land use, and an assessment of those implications.~~

22 ~~9300.0080 EXPECTED CHANGES TO SURFACE WATER, GROUND WATER, AND~~
23 ~~RELATED LAND RESOURCES.~~

24 ~~—— Subpart 1. Changes to be included. Changes may be anticipated in distribution,~~
25 ~~availability, quality, and use of water resources in a county. To assess the probability and~~
26 ~~effect of potential changes to its water resources, a county must list, consider and describe~~
27 ~~the impacts on those resources from the following areas of potential change:~~

28 ~~—— A. changes to the physical environment, land use, and development identified~~
29 ~~under part 9300.0060;~~

30 ~~—— B. special land and water uses or conditions, and trends within or without the~~

1 ~~county that might affect a county's water and related land resources; and~~

2 ~~—————C. the influence of existing programs on water and related land resources and~~
3 ~~the administrative, technical, and financial capability of the county to develop and~~
4 ~~implement new programs.~~

5 ~~———— Subpart 2. Method of listing. Expected changes should be listed by watershed unit~~
6 ~~and ground water system, where appropriate, for water quantity, water quality, special land~~
7 ~~uses~~
8 ~~and conditions, and related land resources categories.~~

9 **9300.0080 ASSESSMENTS AND IMPACTS OF EXPECTED CHANGES TO SURFACE**
10 **WATER, GROUNDWATER, AND RELATED LAND RESOURCES**

11 Subpart 1. Applicability. Assessing information about the surface water, ground water,
12 and related land resources, enables a county to characterize its water and related land
13 resources, and to identify problems and opportunities. By identifying expected changes to
14 surface water, ground water, and related land resources, a county can assess the impact of
15 expected changes to its water resources. Assessments and expected changes should be
16 categorized by major watershed units and ground water systems where appropriate. At a
17 minimum, assessments and expected changes are required by subparts 2 to 5.

18 Subpart 2. Surface water quality and quantity information. The following
19 assessments, and expected changes about water quality and quantity must be included in the
20 plan:

21 A. Surface water quality:

22 (1) the implications of surface water quality information for present and
23 future water and land use, and an assessment of those implications;

24 (2) expected changes to the physical environment, land use, and
25 development identified under part 9300.0060 which influence surface water quality;

26 (3) special land and water uses or conditions, and trends within or
27 without the county that might effect a county's surface water quality; and

28 (4) the influence of existing programs on surface water quality.

29 B. Surface water quantity:

30 (1) the implications of surface water quantity information for present

1 and future water and land uses and an assessment of those implications;

2 (2) expected changes to the physical environment, land use, and
3 development identified under part 9300.0060 which influence surface water quantity;

4 (3) special land and water uses or conditions, and trends within or
5 without the county that might effect a county's surface water quantity; and

6 (4) the influence of existing programs on surface water quantity.

7 Subpart 3. Groundwater quality and quantity information. The following assessments,
8 and expected changes about groundwater quality must be included in the plan.

9 A. Ground water quality:

10 (1) the implications of ground water quality information for present and
11 future water and land uses with emphasis on those with potential health-related impacts and
12 an assessment of those implications;

13 (2) expected changes to the physical environment, land use, and
14 development identified under part 9300.0060 which influence ground water quality;

15 (3) special land and water uses or conditions, and trends within or
16 without the county that might effect a county's ground water quality; and

17 (4) the influence of existing programs on ground water quality.

18 Where possible, the information required in this item should be presented by aquifer
19 system and geographic area.

20 B. Groundwater quantity:

21 (1) the implications of ground water quantity information for present
22 and future water and land uses and an assessment of those implications;

23 (2) expected changes to the physical environment, land use, and
24 development identified under part 9300.0060 which influence ground water quantity;

25 (3) special land and water uses or conditions, and trends within or
26 without the county that might effect a county's ground water quantity; and

27 (4) the influence of existing programs on ground water quantity.

28 Subpart 4. Special land uses and conditions that influence quality and quantity. The
29 following assessments, and expected changes about special land uses and conditions that
30 influence water quality and quantity must be included in the plan:

1 A. Eroding lands:

2 (1) water quality and quantity implications for watercourses, water
3 basins, ditches, and wetlands from sedimentation and an assessment of those implications;

4 (2) an assessment by major watershed unit on the effects of land use
5 and cover on quantity and quality of runoff.

6 (3) expected changes to the physical environment, land use, and
7 development identified under part 9300.0060 which influence erosion and sedimentation;

8 (4) special land and water uses or conditions, and trends within and
9 without the county that might effect erosion and sedimentation; and

10 (5) the influence of existing programs on erosion and sedimentation.

11 B. Irrigation:

12 (1) for any county containing more than 1,000 acres of irrigated land
13 in any one township, the implications of irrigation for present and future land and water use
14 and an assessment of those implications;

15 (2) expected changes to the physical environment, land use, and
16 development identified under part 9300.0060 which influence irrigation;

17 (3) special land and water uses or conditions, and trends within and
18 without the county that might affect irrigation; and

19 (4) the influence of existing programs on irrigation.

20 C. Drainage:

21 (1) an assessment of any significant water quality and quantity effects
22 due to public and private ditch and tile systems;

23 (2) expected changes to the physical environment, land use, and
24 development identified under part 9300.0060 which influence drainage;

25 (3) special land and water uses or conditions, and trends within and
26 without the county that might affect drainage; and

27 (4) the influence of existing programs on drainage.

28 D. Pollutant sources:

29 (1) the implications of pollutant sources for present and future water
30 and land uses and an assessment of those implications;

1 (2) expected changes to the physical environment, land use, and
2 development identified under part 9300.0060 which influence pollutant sources;

3 (3) special land and water uses or conditions, and trends within and
4 without the county that might affect pollutant sources; and

5 (4) the influence of existing programs on pollutant sources.

6 E. Special geologic conditions:

7 (1) the implications of special geologic conditions for present and future
8 water and land uses and an assessment of those implications;

9 (2) expected changes to the physical environment, land use, and
10 development identified under part 9300.0060 which influence special geologic conditions;

11 (3) special land and water uses or conditions, and trends within or
12 without the county that might effect special geologic conditions; and

13 (4) the influence of existing programs on special geologic conditions.

14 Subpart 5. Related land resources. The following assessments, and expected changes
15 about related land resources must be included in the plan:

16 A. Wetlands:

17 (1) the implications of wetlands for present and future water and land
18 uses, with special consideration for water quality, flood attenuation, wildlife, and recreation,
19 and an assessment of those implications;

20 (2) expected changes to the physical environment, land use, and
21 development identified under part 9300.0060 which influence wetlands;

22 (3) special land and water uses or conditions, and trends within and
23 without the county that might affect wetlands; and

24 (4) the influence of existing programs on wetlands.

25 B. Floodplains:

26 (1) an assessment of the adequacy of the data used for regulatory
27 purposes and enforcement of existing floodplain ordinances;

28 (2) expected changes to the physical environment, land use, and
29 development identified under part 9300.0060 which influence floodplains;

30 (3) special land and water uses or conditions, and trends within and

1 without the county that might affect floodplains; and

2 (4) the influence of existing programs on floodplains.

3 C. Shorelands:

4 (1) an assessment of the adequacy and enforcement of the existing
5 shoreland ordinances;

6 (2) expected changes to the physical environment, land use, and
7 development identified under part 9300.0060 which influence shorelands;

8 (3) special land and water uses or conditions, and trends within or
9 without the county that might effect shorelands; and

10 (4) the influence of existing programs on shorelands.

11 D. Water-based recreation lands:

12 (1) an assessment of the adequacy of water-based recreational lands for
13 present and future use;

14 (2) expected changes to the physical environment, land use, and
15 development identified under part 9300.0060 which influence water-based recreation lands;

16 (3) special land and water uses or conditions, and trends within or
17 without the county that might effect water-based recreation lands; and

18 (4) the influence of existing programs on water-based recreation lands.

19 E. Fish and wildlife habitat:

20 (1) an assessment of the adequacy of fish and wildlife habitat for
21 present and future use;

22 (2) expected changes to the physical environment, land use, and
23 development identified under part 9300.0060 which influence fish and wildlife habitat;

24 (3) special land and water uses or conditions, and trends within or
25 without the county that might effect fish and wildlife habitat; and

26 (4) the influence of existing programs on fish and wildlife habitat.

27 F. Unique features and scenic areas:

28 (1) the implications of unique features and scenic areas for present and
29 future water and land use, and an assessment of those implications;

30 (2) expected changes to the physical environment, land use, and

1 development identified under part 9300.0060 which influence unique features and scenic
2 areas;

3 (3) special land and water uses or conditions, and trends within or
4 without the county that might effect unique features and scenic areas; and

5 (4) the influence of existing programs on unique features and scenic
6 areas.

7 **9300.0090 PROBLEMS AND OPPORTUNITIES.**

8 Subpart 1. **Purpose.** Identification of problems and opportunities is needed to guide
9 the county in developing its goals, objectives, policies, and plan of action.

10 Subpart 2. **Description of problems and opportunities.** For each major watershed unit
11 and groundwater system, where appropriate, the comprehensive water plan must identify key
12 issues relating to water quality, quantity, special land uses and conditions, and related land
13 resources. The plan must discuss assets or opportunities, as well as problems associated
14 with each issue. The plan must also address those issues which have been identified as
15 having regional significance or importance.

16 Subpart 3. **Determining issues, problems, and opportunities.** A county must
17 determine water related issues, problems, and opportunities in its comprehensive water plan.
18 At a minimum, a county must gather information about water related problems and
19 opportunities in the following manner:

20 A. investigate those problems and opportunities disclosed at public meetings
21 and in written comments;

22 B. investigate those problems and opportunities that affected local units of
23 government want examined;

24 C. investigate those problems and opportunities derived from assessments of
25 data assess information gathered under parts 9300.0050 to 9300.0080; and

26 D. assess the status and adequacy of official controls, plans, and other local,
27 state, or federal programs concerning water and related land uses.

28 **9300.0100 ESTABLISHMENT OF COUNTY GOALS AND POLICIES.**

29 The comprehensive water plan must state goals and corresponding policies for
30 present and future water and land uses to set the framework for determining plan objectives

1 and related actions.

2 **9300.0110 OBJECTIVES AND PLAN OF ACTION.**

3 The objectives and plan of action should be tailored to address the problems and
4 opportunities previously identified in the comprehensive water plan. A comprehensive water
5 plan must state measurable objectives and a plan of action for each major watershed unit
6 and groundwater system, where appropriate, for each of the following categories:

7 A. opportunities and problems in surface and ground water quality and
8 quantity identified pursuant to part 9300.0090;

9 B. significant special land uses and conditions that influence water quantity
10 and quality based on opportunities and problems identified pursuant to part 9300.0090; and

11 C. related land resources opportunities and problems identified pursuant to
12 part 9300.0090.

13 **9300.0120 PRIORITY ACTION CATEGORIES.**

14 Subpart 1. **Priorities required.** A county must establish priorities in the plan of action
15 relating to water quality, water quantity, special land uses or conditions that influence water
16 quality and quantity, and related land resources.

17 Subpart 2. **Priority development.** A comprehensive water plan must state priorities
18 of action that reflect the urgency of the problem or opportunity identified.

19 Subpart 3. **Priority description.** In describing the priorities, the comprehensive water
20 plan must describe those actions that will be taken by the county alone, and those actions
21 that will require the cooperation of other local units of government or state and federal
22 agencies, and must state whether the county board has received commitments for that
23 cooperation.

24 **9300.0125 IMPLEMENTATION PROGRAM.**

25 Subpart 1. Program, standards, and schedule required. The comprehensive water
26 plan must state how and when the plan will be implemented to meet the objectives and
27 carry out the actions described in parts 9300.0110 and 9300.0120, and establish standards for
28 stormwater runoff. Components and schedules that are described previously do not have
29 to be repeated.

30 Subpart 2. Program. An implementation program may include data collection

1 programs, educational programs, capital improvement projects, project feasibility, studies,
2 enforcement strategies, amendments to existing official controls, adoption of new official
3 controls, and other actions. If the county considers no actions are necessary to address
4 identified problems or opportunities it must explain why actions are not needed. Staff and
5 financial resources available or needed to carry out the comprehensive water plan must be
6 stated.

7 Subpart 3. Stormwater and drainage design performance standards. Each plan must
8 contain minimum standards for the design of new stormwater conveyance, ponding, and
9 treatment systems consistent with the overall goals of the comprehensive water plan and
10 consistent with Minnesota Statutes, section 103B.3365, subdivision 4. The performance
11 standards must provide for:

12 A. the establishment of maximum permissible runoff rates for selected
13 design storms based on considerations such as existing and future flood levels and expected
14 increases in runoff volume with respect to impacts on downstream channels and adjacent
15 properties;

16 B. Reducing the impacts of flooding on natural resources and personal and
17 real property;

18 C. the establishment of design criteria for stormwater outlet structures to
19 address floatable pollutants and to provide access for maintenance and repair;

20 D. The methodology of pond design for nutrient entrapment consistent
21 with the watershed goals identified in the plan; and

22 E. compliance with pollutant loading for specific watersheds consistent
23 with regional and statewide plans in consideration of federal and state water quality
24 standards.

25 Subpart 4. Schedule. The implementation schedule must state the time in which each
26 of the actions contained in the implementation program will be taken.

27 Subpart 5. Roles and responsibilities of local units of government. The
28 comprehensive water plan must include a discussion of the roles and responsibility of each
29 local unit of government in the county including but not limited to soil and water
30 conservation districts, watershed districts, cities, and townships. In addition to general roles

1 and responsibilities of the various local units of government in plan implementation, the
2 county must specifically address the roles and responsibilities of local units of government
3 in the implementation of the Wetland Conservation Act and Water Retention (103B.3365).

4 Subpart 6. Agreements with local units of government. If a county board has made
5 any agreement for the implementation of a comprehensive water plan or portions of a plan
6 with a local unit of government within the county, that local unit and its delegated
7 responsibility must be specified, and a description of how and when the implementation will
8 occur must be included.

9 Subpart 7. Capital improvement program. If capital improvement projects are
10 proposed to implement a comprehensive water plan, the projects must be described in the
11 plan. The description of a proposed capital improvement project must include the following
12 information:

13 A. the physical components of the project, including their approximate size,
14 configuration, and location;

15 B. the purposes of the project and their relationship to the objectives in the
16 comprehensive water plan;

17 C. the proposed schedule for project construction;

18 D. the expected federal, state, and local costs;

19 E. the types of financing proposed, such as special assessments, ad valorem
20 taxes, or grants; and

21 F. the sources of local financing proposed for the project, such as subcounty,
22 countywide, or multicounty.

23 **9300.0130 DESCRIPTION OF RECOMMENDED CHANGES IN STATE PROGRAMS.**

24 If changes in state programs, policies, and requirements that a county considers
25 important to water management in the county are recommended in the comprehensive water
26 plan, the description of those changes must include:

27 A. identification of the specific program, policy, or requirement for which
28 change is recommended by the county;

29 B. a statement of the specific changes recommended by the county; and

30 C. the reasons the county considers the changes important.

1 **9300.0140 LOCAL REVIEW AND POTENTIAL CONFLICTS.**

2 Subpart 1. **Applicability.** The procedures in this part apply to local review and to the
3 identification and resolution of existing and potential conflicts between a comprehensive
4 water plan and the plans or local controls of: (1) local units of government within the county
5 preparing the water plan; (2) contiguous counties; and (3) water management organizations,
6 watershed districts, and joint powers boards sharing jurisdiction over watershed units and
7 groundwater systems affected by the comprehensive water plan.

8 Subpart 2. **Identification of conflicts.** Conflicts or potential conflicts that occur
9 between the comprehensive water plan and the existing or proposed plans of local units of
10 government must be identified either during the planning development or revision process
11 or during review of the comprehensive water plan by other local units of government.

12 Subpart 3. **During plan preparation or revision.** Local units of government must
13 notify the county board intending to develop or revise a comprehensive water plan of any
14 conflicts that those local units want examined and addressed in the comprehensive water
15 plan in accordance with part 9300.0030, subpart 4.

16 Subpart 4. **During plan review.**

17 A. Before it is submitted to the state board for review, the comprehensive
18 water plan must be submitted for review and comment to:

- 19 (1) all local units of government wholly or partly within the county
20 preparing or revising the plan;
- 21 (2) all applicable regional development commissions;
- 22 (3) all contiguous counties and water management organizations; and
- 23 (4) other counties, watershed districts, intercounty joint powers boards,
24 and watershed management organizations within the same watershed unit or groundwater
25 system as the county preparing or revising the plan that may be affected by the plan.

26 B. In their comments on the plan, other local units of government must
27 identify and describe any conflicts they have with the plan not already identified in the plan.
28 The local unit must state its position on any relevant conflict identified by the county for
29 consideration by the state board during the board's review of the plan.

30 C. comments shall be submitted as required by Minnesota Statutes, section

~~110B.08~~ 103B.315, subdivision 3.

Subpart 5. **Description of conflicts.** The description of a conflict in the comprehensive water plan or in the comments of local units of government must include:

A. the units of local government or state agencies involved in the conflict;

B. the comprehensive water plan provisions or omissions causing the conflict;

C. any local plan or control that conflicts with the comprehensive water plan and that would require change;

D. the objections of the local unit of government to the comprehensive water plan; and

E. suggested measures to resolve the conflict other than making the change indicated.

Subpart 6. **Process to resolve conflicts.** The comprehensive water plan must state whether there is a process underway to resolve identified conflicts. If there have been unsuccessful attempts to resolve conflicts, those attempts must be described.

9300.0150 INCORPORATION OF PLANS AND RULES OF WATERSHED DISTRICTS AND INTERCOUNTY JOINT POWERS BOARDS.

Subpart 1. **Incorporation required.** A county must incorporate plans and rules of watershed districts or intercounty joint powers boards with jurisdiction within the county into its comprehensive water plan and may change the plans and rules it incorporates if the requirements of this part are met.

Subpart 2. **Changes to plans and rules.** To change the plans or rules of a watershed district or intercounty joint powers board that a county incorporates into its comprehensive water plan, a county must demonstrate in its plan that changes to the district or intercounty plans or rules are necessary, and that these changes are supported by each county that selects members on the respective boards.

If all affected counties do agree on watershed district or intercounty joint powers board plan or rule revisions, resolutions of support for recommended changes must be attached to the plan.

Subpart 3. **Criteria for changing plans and rules.** To make changes in a watershed district or intercounty joint powers board plan or rule that a county incorporates into its

comprehensive water plan, the county must demonstrate that the plan or rule does not adhere to the principles in part 9300.0170, subpart 4.

9300.0160 IMPLEMENTATION PROGRAM.

~~Subpart 1. Program and schedule required.~~ The comprehensive water plan must state how and when the plan will be implemented to meet the objectives and carry out the actions described in part 9300.0110. ~~Components and schedules that are described previously do not have to be repeated.~~

~~Subpart 2. Program.~~ An implementation program may include data collection programs, educational programs, capital improvement projects, project feasibility studies, enforcement strategies, amendments to existing official controls, adoption of new official controls, and other actions. ~~If the county considers no actions are necessary to address identified problems or opportunities it must explain why actions are not needed. Staff and financial resources available or needed to carry out the comprehensive water plan must be stated.~~

~~Subpart 3. Schedule.~~ The implementation schedule must state the time in which each of the actions contained in the implementation program will be taken.

~~Subpart 4. Agreements with local units.~~ If a county board has made any agreement for the implementation of a comprehensive water plan or portions of a plan by a local unit of government within the county, that local unit must be specified, the responsibility indicated, and a description included indicating how and when the implementation will happen.

~~Subpart 5. Capital improvement program.~~ If capital improvement projects are proposed to implement the comprehensive water plan, the projects must be described in the plan. The description of a proposed capital improvement project must include the following information:

~~A. the physical components of the project, including their approximate size, configuration, and location;~~

~~B. the purposes of the project and their relationship to the objectives in the comprehensive water plan;~~

~~C. the proposed schedule for project construction;~~

1 ~~_____ D. the expected federal, state, and local costs;~~

2 ~~_____ E. the types of financing proposed, such as special assessments, ad valorem~~
3 ~~taxes, and grants; and~~

4 ~~_____ F. the sources of local financing proposed for the project, such as subcounty,~~
5 ~~countywide, or multicounty.~~

6 **REVIEW OF COMPREHENSIVE WATER PLANS BY STATE AGENCIES AND THE**
7 **STATE BOARD**

8 **9300.0160 PRELIMINARY STATE REVIEW.**

9 Subpart 1. Submittal to state agencies. At the same time that a county submits its
10 plan to other local governmental units it must also submit the plan to the state board, to the
11 departments of agriculture, health and natural resources, to the pollution control agency,
12 and to the Minnesota geological survey for preliminary review.

13 Subpart 2. Review criteria. In addition to review for consistency with applicable state
14 statutes and rules, each state agency receiving a comprehensive plan for preliminary state
15 review may also provide a qualitative review of that plan.

16 Subpart 3. Review schedule. Within 45 days of receipt of a comprehensive water plan
17 from a county, a state agency should submit a letter to the county and the board identifying
18 its comments.

19 **9300.0170 FINAL STATE REVIEW.**

20 Subpart 1. Submittal to state board. After conducting the public hearing required by
21 Minnesota Statutes, section ~~110B.08~~ 103B.315, subdivision 4, the county board must submit
22 to the state board ten copies of its comprehensive water plan, all written comments received
23 on the plan, a transcript or tape recording of the public hearing held on the plan, and a
24 summary of changes made to the plan as a result of the local review process.

25 In order to determine whether a comprehensive water plan is consistent with state
26 law, the state board shall make the determinations in the manner provided by subparts 2,
27 3, and 4.

28 Subpart 2. State board consultation with agencies. Upon receipt of a comprehensive
29 water plan and supporting documents, the state board shall transmit a copy of the plan to
30 the departments of agriculture, health, and natural resources; the pollution control agency;

1 ~~the state planning agency~~; the environmental quality board; and any other state agency the
2 state board believes could assist it in determining whether the plan is consistent with state
3 law. An agency receiving a copy of the plan shall determine whether any portion of the plan
4 is contrary to state law. Within 45 days of receipt of a comprehensive water plan from the
5 state board, a state agency must submit a letter to the state board identifying the portions
6 of the plan that the agency has determined to be inconsistent with state law.

7 Subpart 3. State board determination of consistency with other plans. In determining
8 whether a comprehensive water plan is consistent with ~~state law~~ Minnesota Statutes
9 103B.301, the state board shall determine whether the plan is consistent with the plan of
10 another county or counties wholly or partially within affected watershed units or
11 groundwater systems, as required by Minnesota Statutes, section ~~110B.04~~ 103B.311,
12 subdivision 4, clause (4), that has already been approved by the state board or that has
13 already been submitted under subpart 1. To determine consistency, the state board shall
14 consider the compatibility of the plans' goals, objectives and related actions, and
15 implementation programs. If the state board determines that the unapproved or
16 subsequently submitted plan would not impede achievement of the goals, objectives, related
17 actions, and implementation programs of the approved or previously submitted plan or
18 plans, the board shall find the plan consistent with the plan or plans.

19 Subpart 4. Principles for review. To determine whether a comprehensive water plan
20 conforms to the requirements of Minnesota Statutes, section ~~110B.04~~ 103B.311, subdivision
21 4, clause (3), the state board shall determine whether the plan conforms to the following
22 principles: described in part 9300.0020 subpart 3.

23 ~~A. Sound hydrologic management of water:~~

24 ~~————— (1) significant upstream and downstream effects on surface water, and~~
25 ~~up gradient and down gradient effects on ground water, of actions impacting water and~~
26 ~~related land resources should be fully considered;~~

27 ~~————— (2) natural water storage and retention systems should be preserved and~~
28 ~~used to the maximum extent practical;~~

29 ~~————— (3) water management decisions should be based on sound data and~~
30 ~~technical analysis;~~

1 ~~_____ (4) interrelationships between surface and ground water, land and water~~
2 ~~use, and quality and quantity of water should be recognized; and~~

3 ~~_____ (5) potential variations in precipitation, both short-term and long-term,~~
4 ~~should be fully considered.~~

5 ~~_____ B. Effective environmental protection:~~

6 ~~_____ (1) potential cumulative effects of proposed actions should be~~
7 ~~considered;~~

8 ~~_____ (2) prevention of potential water and related land resources problems~~
9 ~~should be emphasized;~~

10 ~~_____ (3) the overall quality of the environment should be protected or~~
11 ~~enhanced; and~~

12 ~~_____ (4) public health and safety should be protected or enhanced.~~

13 ~~_____ C. Efficient management:~~

14 ~~_____ (1) the total benefits of water programs and projects should exceed the~~
15 ~~total costs;~~

16 ~~_____ (2) water management programs should be adequately funded to~~
17 ~~achieve high-priority objectives;~~

18 ~~_____ (3) comprehensive water planning should be coordinated with other~~
19 ~~related planning programs to fill management gaps and minimize duplication of effort;~~

20 ~~_____ (4) comprehensive approaches to identified problems and opportunities~~
21 ~~should be considered; and~~

22 ~~_____ (5) water conservation practices should be used to the maximum extent~~
23 ~~practical.~~

24 Subpart 5. State board decision. Within 90 days after the filing of a comprehensive
25 water plan and supporting documents with the state board, the state board shall approve or
26 disapprove a comprehensive water plan and provide the county board notice of the approval
27 or disapproval of the plan. The state board shall approve a plan only if it determines that
28 the plan is consistent with ~~state law~~ Minnesota Statutes 103B.301. If a plan is disapproved,
29 the state board shall as part of its notice of disapproval provide the county board with a
30 written statement of its reasons for disapproval.

1 Subpart 6. **Resubmittal.** A disapproved comprehensive water plan must be revised
2 by the county board and resubmitted to the state board within 120 days after receiving
3 notice of disapproval, unless the state board extends the period for good cause at the
4 county's request. The state board must identify those portions of a disapproved plan that
5 require revision. Upon receipt of revised portions of the plan, the state board shall follow
6 the same review process as for an originally submitted plan.

7 **IMPLEMENTING AN APPROVED COMPREHENSIVE WATER PLAN**
8 **9300.0180 AMENDMENT OF LOCAL PLANS AND OFFICIAL CONTROLS.**

9 Subpart 1. **Notification after plan adoption.** After a county board has adopted an
10 approved comprehensive water plan or amendments to the plan, the county board that
11 adopted the plan shall notify local units of government within the county of the adoption
12 of the plan or amendments. Within 90 days of the notification, local units of government
13 must submit existing water and related land resources plans and official controls to the
14 county board for review.

15 Subpart 2. **County review.** Within 180 days, the county board shall review the plans
16 and official controls submitted and identify any inconsistencies between the local plans and
17 official controls and the comprehensive water plan. In conducting the review, the county
18 board shall determine the need for local units of government to revise plans, adopt new
19 controls or revise existing controls, and specify the necessary measures to bring the local
20 plans and official controls into conformance with the comprehensive water plan.

21 Subpart 3. **Local appeal.** If a local unit of government disagrees with any changes to
22 its plans or official controls recommended by the county board, the local unit has 60 days
23 after receiving the county's recommendations to appeal the recommendations to the state
24 board.

25 Subpart 4. **Revision to local plans and official controls.** After receiving the
26 recommendations of the county board, or after resolution of an appeal, a local unit of
27 government has 180 days to initiate revisions to its plans and official controls. New or
28 revised plans and official controls must be submitted to the county board for review and
29 recommendations in the manner provided by this part for submission of existing plans and
30 official controls.

1 **9300.0190 AMENDMENT OF A COMPREHENSIVE WATER PLAN.**

2 Subpart 1. **Amendment required.** A comprehensive water plan must apply to every
3 year through the year 1995 or any later year that is evenly divisible by five.

4 Subpart 2. **Description required.** The comprehensive water plan must describe the
5 procedure the county will use for amendment of the plan.

6 Subpart 3. **Procedure and criteria.** All amendments to a comprehensive water plan
7 shall be reviewed in the same manner, and are subject to the same criteria for approval, as
8 an initial comprehensive water plan, except when the proposed amendments constitute
9 minor amendments and:

10 A. the county has held a public hearing to explain the amendments and
11 published a legal notice of the hearing twice, at least seven days and 14 days before the date
12 of the hearing;

13 B. the county has sent copies of the amendments to the affected local units
14 of government, state board, and state review agencies for review and comment;

15 C. the state board has either agreed that the amendments are minor or
16 failed to act within 45 days of receipt of the amendments.

17 Subpart 4. **Form of amendments.** Unless the entire document is reprinted, all
18 amendments adopted by the county must be printed in the form of replacement pages for
19 the plan, each page of which must:

20 A. on draft amendments being considered, show deleted text as stricken
21 and new text as underlined;

22 B. be renumbered as appropriate; and

23 C. include the effective date of the amendment.

24 Subp. 5. **Distribution of amendments.** Each county must maintain a distribution list
25 of agencies and individuals who received a copy of the plan and shall distribute copies of
26 amendments within 30 days of adoption. All counties should consider sending drafts of
27 proposed amendments to all plan review authorities to seek their comments before
28 establishing a hearing date or commencing the formal review process.

29 **RESOLUTION OF DISPUTES**

30 **9300.0200 INFORMAL RESOLUTION OF DISPUTES.**

1 Subpart 1. **Applicability.** A county preparing or that has prepared or revised a
2 comprehensive water plan or another local unit of government may use the procedures
3 provided in this part to:

4 A. determine the meaning of any provision of Minnesota Statutes chapter
5 ~~110B~~ 103B.301, or parts 9300.0010 to 9300.0210;

6 B. resolve any conflict between two comprehensive water plans;

7 C. resolve any conflict between a comprehensive water plan and any local
8 plans or official controls; or

9 D. settle any other dispute relating to a comprehensive water plan.

10 Subpart 2. **Request for meeting; response.** A local unit of government desiring a
11 meeting with the state board chair shall submit a written request to the chair identifying the
12 issue involved, the local unit or units of government involved, and the pertinent provisions
13 of the comprehensive water plan, statute, or rule involved in the dispute. The chair shall
14 in writing acknowledge receipt of the request and, if the request complies with the
15 requirements of this part, notify the other involved local units of government and request
16 a written response from them. If the request for a meeting does not satisfy the requirements
17 of this part, or, if there is no response from other interested local units of government, the
18 chair shall make a reasonable effort to obtain the required information in another manner.

19 Subpart 3. **Response and meeting.** When the chair obtains the response of other
20 involved local units of government or has made reasonable efforts to obtain it, the chair may
21 attempt to resolve the issue informally or shall set a meeting ~~between the chair of the~~
22 dispute resolution committee and the involved local units of government and adequately
23 inform those units in writing of the issues, time, date, and place of the meeting. At the
24 meeting, a local unit of government may be represented by any person or persons of its
25 choosing, subject to control by the ~~chair~~ dispute resolution committee, and the ~~chair~~ dispute
26 resolution committee may consider any relevant evidence or argument by a local unit of
27 government that any reasonable person would rely upon to resolve the issues in question.
28 The decision of the ~~chair~~ dispute resolution committee may be announced at the ~~hearing~~
29 meeting or be made later but in either case shall be reduced to writing and a copy sent to
30 all interested local units of government. The decision of the ~~chair~~ dispute resolution

1 committee is effective 60 days following the decision of the ~~chair~~ dispute resolution
2 committee unless a petition is filed within that time pursuant to Minnesota Statutes, section
3 ~~110B.25~~ 103B.345, subdivision 3, for a contested case hearing under that section.

4 **9300.0210 FORMAL RESOLUTION OF DISPUTES.**

5 Subpart 1. **Applicability.** A county or other local unit of government may petition for
6 a contested case hearing by satisfying the requirements of Minnesota Statutes, section
7 ~~110B.25~~ 103B.345 subdivisions 2 and 3, and this part.

8 Subpart 2. **Petition for hearing.** A petition for a hearing shall be made in writing and
9 addressed to the state board. The petition shall contain:

10 A. the name of the local unit of government petitioning and the names,
11 addresses, and phone numbers of the officers of the local unit of government or other
12 person representing the local unit of government for the purposes of the petition;

13 B. a request for a hearing;

14 C. a statement of the allegations or issues to be determined by the hearing;

15 and

16 D. proof of service of a copy of the petition on all other involved local units
17 of government.

18 Subpart 3. **Filing of petition.** A petition is considered filed with the state board when
19 it is received by the state board. Upon receipt of the petition, the state board shall
20 acknowledge its receipt in writing.

21 Subpart 4. **Request for judge.** Within five days of receipt of a sufficient petition for
22 a hearing, the state board shall file a request under part 1400.5300 for the assignment of an
23 administrative law judge.

24 Subpart 5. **Hearings.** Hearings are governed by the contested case procedure of
25 Minnesota Statutes, chapter 14 and by parts 1400.5100 to 1400.8400.

26 Subpart 6. **Hearing fees.** For the purpose of apportioning the fees of the Office of
27 Administrative Hearings and transcript fees, the state board shall not be considered a party
28 to the proceeding.
29

Report by
BG Gerald E. Galloway
Executive Director
Interagency Floodplain Management Task Force
Executive Office of the President

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To the
United States Senate
Committee on Environment and Public Works

26 May 1994

This report is in response to the Committee's letter of April 18, 1994, asking the Administration to include in its testimony before your Committee, information concerning the activities of the Interagency Floodplain Management Review Committee.

Damages resulting from the heavy rainfalls and related flooding of 1993 in the Upper Mississippi and Lower Missouri River Basins were some of the most devastating in the history of the nation. The magnitude of these floods raised serious concerns about this country's ability to provide adequate flood protection and to respond quickly and effectively during post-flood recovery. Perhaps most significantly, it forced the nation to reconsider its best long-term strategy, not only to prevent a recurrence of the 1993 experience, but to ensure that floodplains and related watersheds function to the fullest extent possible in ways that achieve economic, environmental, and socio-cultural objectives.

Floodplains and watersheds of the Upper Mississippi and Missouri Rivers, and their tributaries and associated watersheds, are extraordinary areas, supporting substantial development and commerce and great ecological wealth. They are also the site of periodic flood losses and environmental disturbances. However, flood events, both large and small, are also a normal aspect of floodplain ecology. While an exceptional event, the Flood of 1993 is merely a larger example of floods and should not overshadow the smaller, more frequent floods that cause locally severe economic and social dislocation, including human suffering. While the 1993 flood serves as the catalyst to review floodplain management, consideration must be given to the full range of flood events with a view toward encouraging better riverine and floodplain management, including all activities within the watershed that may influence the outcome of flood events. There is a clear need to examine and improve the collective efforts of federal, state, tribal, and local governments, individuals, and the private sector in the use of these regionally and nationally significant assets in a manner that will reduce risk, achieve economic efficiency, and enhance natural values.

In response to this need, the Administration's Task Force on Floodplain Management, chaired by the Office of Management and Budget, the White House Office on Environmental Policy, and the US Department of Agriculture, established this Review Committee to

undertake an intensive examination to understand what happened and why during and following the flood, to solicit opinions, and to make recommendations as to what changes in current policies, programs, and procedures would most effectively achieve the goals of floodplain management: risk reduction, economic efficiency, and environmental enhancement. The Committee was charged with developing a comprehensive agenda for validating or modifying existing floodplain and watershed management policies and programs and presenting its recommendations to the Task Force. The Committee:

- Focused on the long-term perspective and did not become involved in recovery operations;
- Obtained the views of state and local governments, non-governmental organizations, and the private sector to assist in identification of floodplain and watershed management issues and development of recommendations to address those issues;
- Examined existing federal programs that affect activities within floodplains and related watersheds;
- Identified means to improve coordination and consistency of implementation among agencies and among all levels of government to optimize floodplain management for multiple objectives;
- Examined the alternative uses of limited fiscal and personnel resources, both federal and non-federal (including the private sector), to meet comprehensive floodplain management objectives;
- Developed recommendations for policy, program and procedural changes that could be applied nationally as well as in the study area;
- Considered legislative initiatives that might be proposed by the Administration.

The Committee's report addresses:

- Major causes and consequences of the 1993 floods;
- Performance of existing flood control, floodplain management, and recovery programs associated with this event;
- Significant historic factors leading to current uses of the floodplain and an assessment of the current balance between competing economic, environmental, and socio-cultural uses of the floodplain;

- Incentives and disincentives that are built into existing federal policies and programs designed to reduce damages to occupants of the floodplain and co-share the risk of this floodplain occupation;
- Opportunities for restoration of the natural and beneficial functions and values of the river basin ecosystems, not only as a means reducing flood risks and flood damages, but also as a means of assuring that uses of the river basins reflect national environmental goals;
- How decisions made in upland areas of the basin affect floodplains, not only for major floods such as the 1993 experience, but also for floods occurring with a greater frequency;
- Relationships and responsibilities among and between federal, state, tribal, and local activities dealing with floodplain management to include assessment of consistency among federal programs, geographically and structurally; and
- Information gathering and sharing activities required for effective and coordinated floodplain management.

The Committee recognized from the outset that the federal government cannot and should not address these problems by itself. The subject of floodplain management is enormously complex and involves a broad array of federal, state, tribal, and local programs and responsibilities. In its deliberations, the Committee has actively sought the views of state and local governments and the private sector. Since its formation in January, members of the Committee have visited all of the flood states and met with the Governors (or their representatives) and state officials, representatives of over sixty communities, interest groups, members of Congress and their staff from the flood states, and staff members from interested Senate and House Committees.

The report represents the views of the Review Committee and is based on the research, interviews with agency personnel, Governors, state and community representatives, nongovernmental organizations, businesses, farmers, and residents of the floodplains.

The report does not represent the views of the agencies that are represented on the Review Committee, nor does it represent the views of the Administration. The report, when finalized, will be presented to the Administration's Floodplain Management Task Force. The Task Force will then consider the report, and determine what actions and further analysis should be recommended for implementation by the Administration.

COMMITTEE FINDINGS: THE MIDWEST FLOOD OF 1993 AND THE UPPER MISSISSIPPI RIVER BASIN

In reviewing the Midwest Flood of 1993, the Committee found that:

- The Midwest Flood of 1993 was a hydrometeorological event unprecedented in recent times. It was caused by excessive rainfall that occurred throughout a significant section of the upper Mississippi River Basin. The damaging impacts of this rainfall and related runoff were felt both in upland areas and in the floodplains. Pre-flood rainfall saturated the ground and swelled tributary rivers. Subsequent rains quickly filled surface areas, forcing runoff into the lower lands and creating flood conditions. The recurrence interval of the flood ranged from less than 100 years at many locations to near 500 years on the segment of the Mississippi from south of Burlington, Iowa, to St. Louis, Missouri. At 45 U.S. Geological Survey (USGS) gaging stations, the flow levels exceeded the 100-year mark. The duration of the flood added to its significance. Many areas were under water for months.
- Rainfall and floods like the 1993 event will continue to occur. Floods are natural repetitive phenomena and given the nation's short history of hydrologic record-keeping as well as our limited knowledge of long-term weather patterns, their recurrence interval is difficult to predict. Activities in the floodplain, even with levee protection, continue to remain at risk.
- The loss of wetlands and upland cover and modification of the landscape throughout the basin over the last century and a half dramatically increased runoff. Most losses occurred prior to 1930, but some are related to more recent drainage, flood damage reduction and navigation development. Although upland watershed treatment and restoration of upland and bottomland wetlands can reduce flood stages in more frequent floods (25 years and less), it is questionable whether they would have significantly altered the 1993 conditions.
- Human activity throughout the basin has caused significant loss of habitat and ecosystem diversity. Flood damage reduction and navigation works, and land use practices have altered adversely bottomland habitat.
- The costs to the nation from the flood were extensive. Thirty-eight deaths can be attributed directly to the flood and estimates of fiscal damages range from \$12 to \$16 billion. Agriculture accounted for over half of the damages and more than 70 percent of the agricultural damages occurred in upland areas where ground saturation prevented planting or killed the crop. Nearly 50 percent of the approximately 100,000 homes damaged, suffered losses to groundwater or sewer backup as opposed to riverain flooding. Flood response and recovery operations cost the nation in excess of \$6 billion. In addition there are many costs that can not yet be quantified. Impacts on businesses in and out of the basin have not been

calculated. Tax losses to governments are unknown. The impacts of the flood on the population's physical and mental wellbeing are just being identified and are of concern.

- Flood damage reduction projects, and floodplain management programs where implemented, worked essentially as they were designed and significantly reduced the damages to population centers, agriculture and industry. It is estimated that reservoirs and levees built by the U.S. Army Corps of Engineers (USACE), prevented over \$19 billion in potential damages. Large areas of Kansas City and St. Louis were spared the ravages of the flood, although several of their suburbs suffered heavy damages. Watershed projects built by the Soil Conservation Service saved an estimated additional \$400 million. Land use controls required by the National Flood Insurance Program (NFIP) and state floodplain management programs reduced the number of structures at risk throughout the basin.

- Many locally constructed levees breached and/or overtopped. These failures frequently resulted in considerable damage through scour and deposition to the land behind the levees.

- Flooding during the 1993 event would have covered much of the floodplains of the mainstem lower Missouri and upper Mississippi rivers whether or not levees were there. Levees can cause problems in some critical reaches by backing water up on other levees or lowlands. Locks and dams and other navigation related structures did not raise flood heights. For more frequent floods -- less flow -- navigation dikes may cause some minor increase in flood heights.

COMMITTEE FINDINGS: FEDERAL, STATE AND LOCAL ACTIVITIES

The Committee reviewed the structure of current federal programs, relationships among federal, state, tribal and local governments, the performance of various programs during and after the flood, and the after action reports stemming from these activities. The Review Committee reached the following conclusions:

- The division of responsibilities for floodplain management activities among and between federal, state, tribal and local governments needs to be more clearly defined. Within the federal system better coordination is needed for water resources activities in general and floodplain management in particular. State and local governments must have a fiscal stake in floodplain management; without this stake there are few incentives to be fully involved in floodplain management. State governments must assist local governments in dealing with federal activities. The federal government must set the example in floodplain management activities.

- The National Flood Insurance Program (NFIP) needs improvement. Penetration of flood insurance into the target market -- floodplain occupants -- is very low, 20-30 percent.

Communities choosing not to participate in the NFIP continue to receive substantial disaster assistance. Provision of major federal disaster assistance to those without insurance creates a perception with many floodplain residents that purchase of flood insurance is not a worthwhile investment. The mapping program is underfunded and needs greater accuracy and coverage. Some requirements within the program vary from disaster to disaster and need stabilization.

- The principal federal water resources planning document, *Principles and Guidelines*, is outdated and does not reflect a balance among the economic, social and environmental goals of the nation. This lack of balance is exacerbated by a present inability to quantify, in monetary terms, some environmental and social impacts and, as a result, these impacts are frequently understated or omitted. Many critics of *Principles and Guidelines* see it as biased against non-structural approaches.
- Existing federal programs designed to protect and enhance the floodplain and watershed environment are not as effective as they should be. They lack emphasis, coordination, flexibility and funding and as a result, progress in habitat improvement is slow.
- Federal pre-disaster, response, recovery and mitigation programs need streamlining but are making marked progress. The aggressive and caring response of the government to the needs of flood victims clearly was recognized but many coordination problems developed and need to be addressed. Buyouts of floodprone homes and damaged lands made important inroads in reducing future flood losses.
- There is an absence of a coordinated strategy for effective management of the water resources of upper Mississippi River Basin. Responsibility for integrated navigation, flood damage reduction and ecosystem management is divided among several federal activities.
- The current flood damage reduction system in the upper Mississippi River Basin represents a loose aggregation of federal, local and individual levees and reservoirs and does not ensure the desired reduction in the vulnerability of floodplain activities to damages. Many levees are poorly sited and will fail again in the future. Without some change in current federal programs, some of these levees will remain eligible for post-disaster support. Levee restoration programs need greater flexibility to provide for concurrent environmental restoration.
- Science and technology are not being used to full advantage in gathering and disseminating critical water resources management information. Opportunities exist to provide information needed to better plan the use of the floodplain and to operate during crisis conditions.

COMMITTEE RECOMMENDATIONS:

Based on the above findings, the Committee's draft recommendations, developed in consonance with the proposed goals, are as follows:

- To ensure that the floodplain management effort is organized for success, the President should:
 - ▶ Propose enactment of a Floodplain Management Act which establishes a national paradigm for floodplain management, clearly delineates federal, state, tribal, and local responsibilities, provides fiscal support for states and local floodplain management activities and recognizes states as the nation's principal floodplain managers.
 - ▶ Issue a revised Executive Order clearly defining the responsibility of federal agencies to exercise sound judgement in floodplain activities.
 - ▶ Activate the Water Resources Council to coordinate federal and federal-state-tribal activities in water resources. As appropriate, reestablish river basin commissions to provide a forum for federal-state-tribal coordination on regional issues.
- To focus attention on comprehensive evaluation of all federal water project and program effects, the President should immediately establish environmental quality and national economic development as co-equal objectives of planning conducted under the *Principles and Guidelines*. *Principles and Guidelines* should be revised to accommodate the new objectives and to ensure full consideration of non-structural alternatives.
- To enhance coordination of project development, to address multiple objective planning and to increase customer service, the Administration should support collaborative efforts among federal agencies and across state, tribal, and local governments.
- To ensure continuing state, tribal, and local interest in floodplain management success, the Administration should provide for federal-state-tribal-local cost-sharing in pre-disaster, response, recovery, and mitigation activities.
- To provide for coordination of the multiple programs dealing with watershed management, the Administration should establish an Interagency Task Force to develop a coordination strategy to guide these actions.

- To take full advantage of existing federal programs which enhance the floodplain environment and provide for natural storage in bottom and uplands, the Administration should:
 - ▶ Seek legislative authority to increase post-disaster flexibility in the execution of the land acquisition programs.
 - ▶ Increase environmental attention in federal operation and maintenance and disaster recovery activities.
 - ▶ Better coordinate the environmentally-related land interest acquisition activities of the federal government.
 - ▶ Fund, through existing authorities, programmatic acquisition of needed lands from willing sellers.
- To enhance the efficiency and effectiveness of the National Flood Insurance Program, the Administration should:
 - ▶ Take vigorous steps to improve the marketing of flood insurance, enforce lender compliance rules and seek state support of insurance marketing.
 - ▶ Reduce the amount of post-disaster support to those who were eligible to buy insurance but did not, to the level needed to provide for immediate health, safety and welfare; provide a safety net for low income flood victims.
 - ▶ Reduce repetitive loss outlays by adding a surcharge to flood insurance policies following each claim under a policy; providing for mitigation insurance riders and supporting other mitigation activities.
 - ▶ Require those who are behind levees that provide protection against less than the standard project flood discharge to purchase actuarially based insurance. This will ensure that the residual risk is borne by the affected parties.
 - ▶ Increase the waiting period for activation of flood insurance policies from 5 to 15 days to limit purchases when flooding is imminent.
 - ▶ Leverage technology to improve the timeliness, coverage and accuracy of flood insurance maps; support map development by levies on the policy base and from appropriated funds because the general taxpayer benefits from this program.

- ▶ Provide for the purchase of mitigation insurance to cover the cost of elevating, demolishing, or relocating substantially damaged buildings.
- To reduce the vulnerability to flood damages of those in the floodplain, the Administration should:
 - ▶ Give full consideration to all possible alternatives for vulnerability reduction, including permanent evacuation of flood prone areas, flood warning, floodproofing of structures remaining in the floodplain, creation of additional natural and artificial storage and adequately sized and maintained levees and other structures.
 - ▶ Adopt flood damage reduction guidelines based on revised *Principles and Guidelines* which would give full weight to social, economic and environmental values and assure that all vulnerability reduction alternatives are given equal consideration.
 - ▶ Where appropriate, reduce the vulnerability of population centers and critical infrastructure to the standard project flood discharge through use of floodplain management activities and programs.
- To ensure that existing, federally constructed, water resources projects continue to meet their intended purposes and are reflective of current national, social, and environmental goals, the Administration should require periodic review of completed projects.
- To provide for efficiency in operations and for consistency of standards, the Administration should limit repair, rehabilitation and construction of levees under federal programs to the US Army Corps of Engineers.
- To ensure the integrity of levees and the environmental and hydraulic efficiencies of the floodplain, states and tribes should ensure proper siting, construction, and maintenance of non-federal levees.
- To capitalize on the successes in federal, state, tribal, and local pre-disaster, response, recovery, and mitigation efforts during and following the 1993 flood and to streamline future efforts, the Administration should:
 - ▶ Through the NFIP Community Rating System, encourage states and communities to develop and implement floodplain management and hazard mitigation plans.
 - ▶ Provide funding for programmatic buyouts of structures at risk in the floodplain.

- ▶ Provide states the option of receiving Section 404 Hazard Mitigation Grants as block grants.
 - ▶ Assign the Director, Federal Emergency Management Agency, responsibility for integrating federal disaster response and recovery operations.
 - ▶ Encourage federal agencies to use non-disaster funding to support hazard mitigation activities on a routine basis.
- To provide integrated, hydrologic, hydraulic and ecosystem management of the upper Mississippi River Basin, the Administration should:
 - ▶ Establish Upper Mississippi River and Missouri River Basin Commissions to deal with basin level program coordination.
 - ▶ Assign responsibility, in consultation with the Congress, to the Mississippi River Commission (MRC), for integrated management of flood damage reduction, ecosystem management and navigation on the Upper Mississippi River and tributaries. Expand MRC membership to include representation from the Department of the Interior. Assign MRC responsibility for development of a plan to provide long-term control and maintenance of sound federally built and federally supported levees along the main stems of the Mississippi and Missouri Rivers. This support would be contingent on meeting appropriate engineering, environmental and social standards.
 - ▶ Seek authorization from the Congress to establish an Upper Mississippi River and Tributaries project for management of the federal flood damage reduction and navigation activities in the upper Mississippi River Basin.
 - ▶ Establish the upper Mississippi River Basin as a cross-agency Ecosystem Management Demonstration Project.
 - ▶ Charge the Department of the Interior with conduct of an ecosystem needs analysis of the upper Mississippi River Basin.
 - To provide timely gathering and dissemination of the critical water resources information needed for floodplain management and disaster operations, the Administration should:
 - ▶ Establish at USGS an information clearing house to provide federal agencies and state and local activities the information already gathered by the federal government during and following the 1993 flood and to build on the pioneering nature of this effort.

- Exploit science and technology to support monitoring, analysis, modeling, geographic information system and decision support system development for floodplain activities.

During the first week in May, the Committee prepared a first draft of its report for internal use. On May 26, the Committee will release a draft report for agency, state and Congressional comment. The final report is expected to be submitted to the Administration Floodplain Management Task Force in mid-June.

The Review Committee is comprised of an Executive Director and full-time assignees from federal agencies (Department of Agriculture, Environmental Protection Agency, Federal Emergency Management Agency, Department of the Interior, and the Army Corps of Engineers). The core group is working in Washington, D.C. Another element of the Committee, the Scientific Assessment and Strategy Team (SAST), worked in Sioux Falls, South Dakota, to gather and analyze data related to flooding and its impacts. (Sioux Falls is the site of the Geological Survey's Earth Resources Observation Systems Data Center.) The SAST is developing a data base of important information pertaining to the basin and the flood and will make this information available to federal and state agencies in mid-summer 1994. The Committee has been assisted on an as-needed basis by additional support within each of the participating agencies or from other agencies of the federal government. Several support functions including communications, Congressional relations, and legal assistance were assigned to specific offices and individuals within the Federal Emergency Management Agency and the Department of Justice, respectively. Additionally, the Council of Economic Advisors organized an advisory group for addressing economic analysis issues. The Council on Environmental Quality participated in the Review to ensure that the principles embodied in the National Environmental Policy Act are pursued.



STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

500 LAFAYETTE ROAD, ST. PAUL, MINNESOTA 55155-4037

OFFICE OF THE
COMMISSIONER

DNR INFORMATION
(612) 296-6157

May 6, 1994

Mr. Ronald D. Harnack, Executive Director
Minnesota Board of Water and Soil Resources
Southbridge Office Bldg.
155 S. Wabasha St.
Suite 104
St. Paul, MN 55107

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BOARD OF WATER
& SOIL RESOURCES

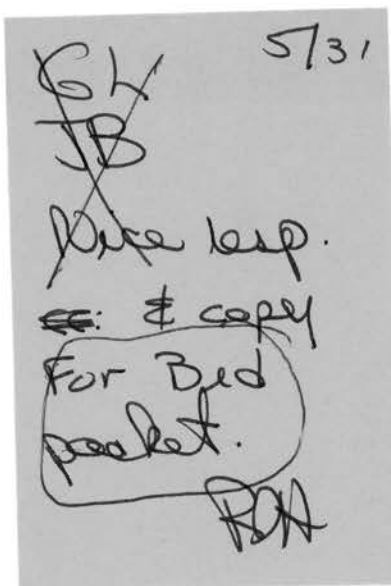
Dear Mr. Harnack:

I would like to express my appreciation for your staff's participation in the training program we recently conducted for DNR employees on the Wetland Conservation Act. The assistance provided by John Jaschke and Jim Haertel in developing the program and the presence of many of your board conservationists at our regional sessions contributed greatly to the success of the training. I look forward to continuing the excellent cooperation and coordination between our agencies in protecting the state's wetland resources.

Yours truly,

Rodney W. Sando
Commissioner

cc: John Jaschke
Jim Haertel
Bruce Sandstrom
Ron Shelito
Jeff Nielsen





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MINNESOTA
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CONSERVATION IMPACT

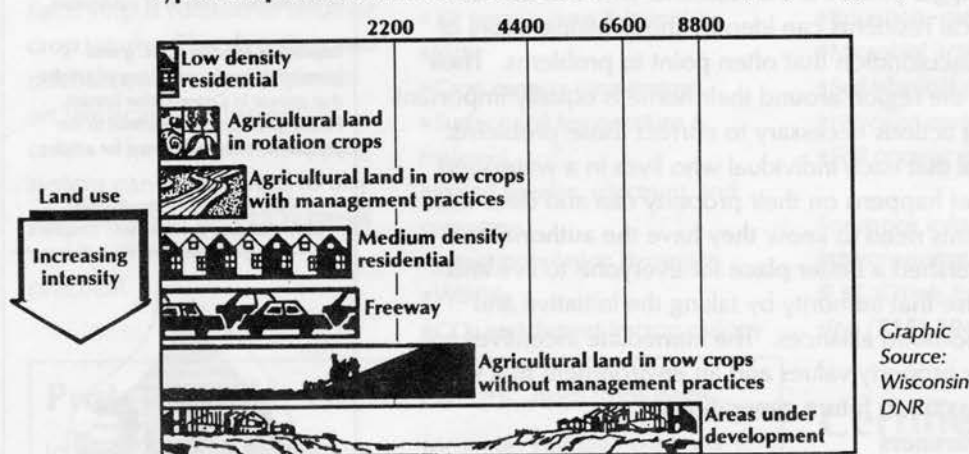
CONSERVATION TECHNOLOGY INFORMATION CENTER

Protecting the Great Lakes:

Controlling soil erosion and sedimentation



Typical suspended sediment load for different land uses (lbs./acre/year)



Graphic
Source:
Wisconsin
DNR

Soil erosion has several major economic and environmental consequences. The productivity of the soil is degraded and sites where sediment is desposited are adversely affected. Soil particles also change the physical nature of the water systems they reach.

Costs

In the U.S. Great Lakes states it is estimated that farmers lose 606 million tons of topsoil each year from soil erosion on cropland. The loss of nutrients alone is estimated at over \$3 billion annually.

Another serious problem is the effect of runoff on the aquatic environment. The runoff from soil erosion clouds waters and adds nutrients that threaten a multi-billion dollar sport and commercial fishing industry in the Great Lakes and make other recreational activities like swimming less desirable.

Dredging sediment from recreational and commercial harbors in the

Great Lakes costs the public tens of millions of dollars each year, plus the tab for disposal. Sediment-choked rivers and streams increase flood control expenses.

Taking action

While existing programs are making progress, a partnership approach is now emerging throughout the Great Lakes Basin that is intent on doing more to stem nonpoint source pollution.

According to the recommendations of the Great Lakes Commission's regional Soil Erosion and Sedimentation Task Force, that "more" includes:

- seeking priority funding for soil erosion and sedimentation problems;
- expanding eligibility of farmland for federal cost-share support to prevent water quality problems;
- developing innovative programs to promote responsible land-use management;
- establishing a federal/state partnership

(Continued on page 3)

Vol. 12, No. 1 January 1994

INSIDE...

A quick review

Director's Notes - Everyone plays a role in making their watershed a better place. CTIC offers publications to explain the basics and give neighbors a start. **2**

Clean Waters - Strip intercropping is a system that holds promise for profitable and environmentally-sound agriculture.

•Check out the new contacts to add to your list in the *Nonpoint Source Water Quality Contacts Directory*. **3**

Technology Exchange - Our readers submit items for this new quarterly section. Read about the conservation tillage implement for cotton, the ridge-till attachment and the automatic guidance caddy. There's also information on a youth education program and a ridge-till guide. **4**

Newsline - The first genetically engineered sorghum plants have been developed by scientists.

•Researchers have isolated atrazine-eating microbes that thrive in high concentrations of the pesticide.

•A natural fungus could be the answer to controlling a weed found in southern states.

•Experts offer a list of five low-profile windbreak shrubs for center-pivot irrigation. **5**

Field Notes - How farmers and dealers can help themselves and crop residue management. A free publication and the latest information on a satellite TV series. **6**

Product News - Attacking the coulter confusion by testing several setups. **7**

Calendar - Use the coupon to claim your registration discount for the Pesticide Management Conference! Don't miss the CTIC Forum at the NACD Convention. **8**

DIRECTOR'S NOTES



By Jerry Hytry
CTIC Executive
Director

"Residents need to know they have the authority to make their watershed a better place for everyone to live and they can exercise that authority by taking the initiative and forming neighborhood alliances."

Watersheds: everyone's initiative

When it comes to water quality and the environment, the word is "watershed." We hear it from the Department of Agriculture, the Environmental Protection Agency and it is prominently featured in bills before Congress. Watershed is a term that invites us to consider the bigger picture.

The same is true for adopting a "watershed approach" to a project. Such an approach involves looking at the bigger picture - the entire landscape within a drainage basin.

Watershed residents

No matter the size of the watershed, a critical component in assessing the bigger picture is the residents who live in that watershed. Local residents can identify the lingering odors or stream water discoloration that often point to problems. Their familiarity with the region around their home is equally important for determining actions necessary to correct those problems.

It is essential that each individual who lives in a watershed realize that what happens on their property can and does affect others. Residents need to know they have the authority to make their watershed a better place for everyone to live and they can exercise that authority by taking the initiative and forming neighborhood alliances. The immediate incentives are obvious: higher property values and an environment that we can be proud to pass on to future generations.

Generating awareness

So how does CTIC assist in generating the kind of awareness necessary for the residents of a watershed to voluntarily take the helm in determining their future? The answer is: with a lot of help. CTIC works with corporations, government agencies, institutions and others to develop practical information and find the distribution systems to reach the public.

Tools to help

For starters, we've received plenty of assistance from the public and private sectors to develop a brochure called *Forming a Watershed Alliance* as well as two *Watershed Awareness Scorecards*. The brochure explains what a watershed is and how individuals can join forces to make it better. The scorecards come in two versions, one for farmers and ranchers, another for rural and suburban landowners. They're great for getting folks to assess their own actions and how those actions affect their watershed. Get a copy of these publications by sending us a self-addressed, stamped envelope.

All this may sound rather simplistic but the objective is clear: help Americans act to voluntarily protect and enhance the environment - starting with their own watershed. For now, the choice is ours. Let's do it voluntarily today and avoid regulation tomorrow. We all live in a watershed, it's up to each of us to take the initiative.

CONSERVATION IMPACT

ISSN 1056-9707

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Reprinting articles: CTIC grants permission for the reprinting of articles that appear in *Conservation Impact*. Please give appropriate credit to the periodicals cited as sources for articles.

Jim Mitchell: Editor/layout
Adam Pletcher/Jim Mitchell: Graphics



Phone: (317) 494-9555
FAX: (317) 494-5969

CTIC is a non-profit center guided by a partnership of corporate, organizational and individual members and governmental participants who meet regularly on its behalf. The center is funded by memberships, federal agencies and the sale of informational products and services. CTIC is a division of the National Association of Conservation Districts (NACD).

CTIC's mission is to promote the adoption of economically viable and environmentally acceptable agricultural and natural resource management practices.

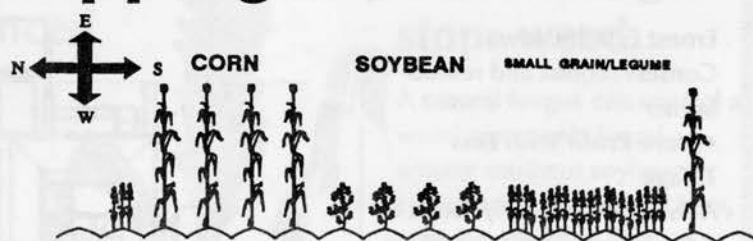
CTIC Staff

Jerome C. Hytry - Executive Director
Jim Mitchell - Communications Director
T. Daniel McCain - SCS Field Specialist
Lyn T. Kirschner - SCS/EPA Water Quality Specialist
Tammy Taylor - Administrative Assistant
W. John Becherer - Senior Director, Development & Programs
Scott Brunton - Computer Specialist

Strip intercropping

The search for cropping systems that have neutral or favorable environmental impact, diversify crop production, and maintain or improve farm profitability is leading some researchers and farmers to strip intercropping.

A strip intercropping system involves crops grown in a series of adjacent narrow strips covering the entire field. Each strip is rotated to another crop yearly. The direction and orientation of strips depends on landscape and selected crops. The strip intercropping system can be adapted to any tillage system, though ridge-till and no-till appear most practical.



Environmental factors and plant resources enhanced by strip intercropping system:

Above ground:

- Surface residue & cover
- Soil erosion control
- Air speed & motion
- Air temperature & humidity
- Light
- Crop canopy temperature
- Surface soil temperature & moisture
- Weed species, spectrum, and pressure
- Insect population dynamics
- Wildlife
- CO₂ enrichment in crop canopy

Below ground:

- Water storage
- Evapotranspiration
- Nutrient uptake
- Root penetration (time & space)
- Microbial activities
- Soil physical properties
- Nitrogen enrichment
- Soil organic matter content

For more information on strip intercropping, contact: Dr. R.M. Cruse, Iowa State University, (515) 294-7850.

Protecting the Great Lakes...from front page

to specifically target soil erosion and sedimentation problems.

New directions

In 1990, a federal/state partnership called the Great Lakes Basin Program for Soil Erosion and Sediment Control was established. Coordinated by the Great Lakes Commission, U.S. Environmental Protection Agency - Region 5, USDA Soil Conservation Service, and a regional task force from the eight Great Lakes states (Illinois, Indiana, Minnesota, Michigan, New York, Ohio, Pennsylvania and Wisconsin) the program's specific goal is to protect and improve Great Lakes water quality by controlling erosion and sedimentation.

Reaching the goal

To attain this goal the program:

- seeks legislative recognition

for water quality problems associated with erosion and sedimentation;

- coordinates efforts, roles and initiatives between governmental agencies in the Great Lakes Basin;
- supports the development and implementation of the erosion and sedimentation components of existing programs;
- builds coalitions and networks to inform and educate all sectors of Great Lakes interest groups on common interests and goals;
- seeks to protect and enhance the region's water quality for the benefit of all environmental and economic interests.

For more information, contact the Great Lakes Commission: *The Argus II Bldg., 400 Fourth St., Ann Arbor, MI 48103-4816, Phone: (313) 665-9135*

Certified Crop Advisor program

The Certified Crop Advisor program is a nationally recognized, voluntary certification program developed through the collaborative effort of the public sector and the agriculture industry to ensure high standards for crop advisors.

It is intended for anyone who makes nutrient, pesticide, crop or environmental recommendations to producers, including dealers, distributors, applicators, consultants, manufacturers, allied industries, state and federal agency personnel.

For more information, call Laurie at the American Society of Agronomy - (608) 273-8080.

CLEAN WATERS



*By L.T. Kirschner
CTIC Water
Quality Specialist*

Additions to the

'93-'94 Nonpoint Source

Water Quality Contacts

Directory:

- Stephen B. Owen
Team Leader, Tech. Support Team, USDA, SCS, TISD
2625 Redwing Road, Suite 110, Fort Collins, CO 80526
(303) 282-1971
FAX: (303) 282-1411
- Gerald L. Montgomery
Water Quality (WQ) Coordinator USDA SCS
Midwest National Technical Center, Federal Bldg., Rm 152
Lincoln, NE 60508
(402) 437-5315
FAX: (402) 437-5165
- Denise Ford
WQ Coordinator
USDA SCS
South National Technical Center, P.O. Box 6567
Fort Worth, TX
(817) 334-5242
FAX: (817) 334-5290
- Carl DuPoldt
WQ Coordinator
USDA SCS
Northeast National Technical Center, 160 E. 7th St.
Chester, PA 19013
(215) 499-3930
FAX: (215) 499-3979
- Howard R. Thomas
WQ Coordinator
USDA SCS West National Technical Center, 511 N.W. Broadway, Rm 248
Portland, OR 97209
(503) 326-4127
FAX: (503) 326-6308

**Conservation Impact 3
January 1994**



technology - the branch of knowledge that deals with applied science, the application of knowledge for practical ends

Readers are invited to submit items for Technology Exchange, a quarterly feature of *Conservation Impact*. For a submission form, contact CTIC at (317) 494-9555.

CTIC provides Technology Exchange as a tool to help readers circulate technology. The center does not endorse products or other items featured. CTIC reserves the right to edit all submissions to fit space requirements.

Conservation Impact readers transfer technology!

Ernest E. Behn, Iowa
Conservationist and retired farmer

•More Profit With Less Tillage

A "how to" and "why" book on ridge-tillage. Tells how to get started and how to maintain an environmentally and economically-sound program. \$10.00 a copy, includes postage.

The technology applies especially in the Midwest but users hail from Kansas, Texas, Canada, Australia and Brazil.

Contact: Ernest E. Behn
1309 Quill Avenue
Boone, Iowa 50036
(515) 432-1569

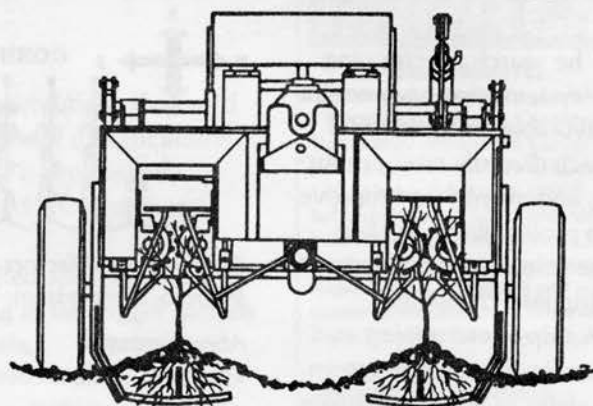
Craig A. Fleishman, Iowa
Farmer

•Ridge-till attachment

Ridge-cleaners attach to Case IH 900 trail-type planter, ahead of planter units. The units are totally independent of the planter row units. The ridge-cleaners have their own parallel linkage and clear a 12" path of moist, clean soil ahead of the seed unit. Angled guide wheels keep the planter on the ridge. The ridge is cleared with 2-14" disc-type blades, followed by a V-shaped blade.

This attachment is best suited for northern Corn Belt where drainage is a problem. Well-suited for gently rolling soils.

Contact: Craig A. Fleishman
1776 Quinlan Ave.
Minburn, Iowa 50167
(515) 677-2325



TRAFFIC FURROW NO TILLAGE TILLAGE FOR ROOT PENETRATION IRRIGATION FURROW NO TRAFFIC. TILLAGE FOR WATER PENETRATION TILLAGE FOR ROOT PENETRATION TRAFFIC FURROW NO TILLAGE

Al Ruozi, California

Interstate Equipment & Mfg. Co.

•Conservation tillage implement for cotton production

Digs, extracts, crushes and shreds the whole cotton plant and root system. With optional re-bedding attachment, re-shapes the same beds all in one operation. Ideal for use with the stale/fallow seedbed system or for growers who follow cotton with vegetable crops. Low horsepower requirements. Available in two- or four-row units.

Approximately 125 units are in use in the San Joaquin Valley of California.

Contact: Al Ruozi, Interstate Equipment & Mfg. Co., P.O. Box 70296, Bakersfield, CA 93387. (805) 322-6659.

Richard Follmer, Illinois
Farmer and president of Progressive Farm Products

•Automatic Guidance Kaddy

Auto-Kaddy, a first of its kind caddy capable of carrying a high residue cultivator, plus up to 1,000 gallons of 28% nitrogen. Gives the farmer auto-guidance on the row with the ability to side-dress fertilizer while cultivating. It allows the use of a smaller tractor, while keeping tanks off the tractor and on the caddy. Also useful for split application of nitrogen in corn.

The caddy is used across the Corn Belt for high residue or conventional cultivator guidance.

Contact: Richard Follmer
R.R. #1 Box 17
Hudson, IL 61748
(309) 454-1564

Jennifer Heirman, Texas
Student

•Youth spreading environmental awareness

Program to train youth to conduct environmental awareness programs to elementary, secondary and adult audiences. The youth receive training on how different biological indicators such as physiology, botany, earth science and ecological sciences interact with human needs and economics to affect all natural resource decisions.

The program was started last summer in Texas.

Contact: Jennifer Heirman
Rt.1 Box 141B
Albany, TX 76430
After 4:00 p.m. weekdays,
phone: (914) 762-3165.

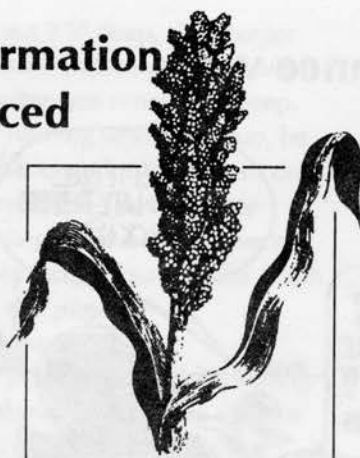
**Don't guess,
soil test!**

First genetic transformation of sorghum announced

The first genetically engineered sorghum plants have been developed by a team of scientists at Purdue University and two other laboratories. The scientists were able to move a gene into two species of sorghum using a procedure known as microprojectile bombardment. Scientists say they can now use genetic engineering techniques with sorghum to transfer traits such as resistance to disease or pests.

Because corn and sorghum are cereal crops that are similar genetically, the science may also benefit corn farmers.

Sorghum is fifth among cereals in production worldwide, and is the primary food



source for 300 million people in the semi-arid regions of Africa and Asia. It is important in the U.S. as a livestock feed.

The results of the research were published in *The Proceedings of the National Academy of Science* in December. For more information, contact: Ray Bressan, (317) 494-1336; Mike Hasegawa, (317) 494-1315 or John Axtell, (317) 494-8056.

Natural fungus stops weed

A natural fungus can control a weed commonly found among southern soybean, cotton and rice. In field tests, spraying the fungi (known as *Collectotrichum truncatum*) mixed with oil droplets in water killed more than 90 percent of the hemp sesbania weed - compared to commercial herbicide. The USDA Agricultural Research Service (ARS) is patenting use of the fungus and scientists are developing ways to mass-produce it.

- Contact: C. Douglas Boyette, USDA ARS Southern Weed Science Laboratory, Stoneville, Mississippi, (601) 686-5217.

NEWSLINE



Short shrubs: windbreaks for irrigation

A group of farmers, agronomists and irrigation specialists in Minnesota have released a list of low-profile shrubs that would serve as good windbreaks with center-pivot irrigation systems.

They're recommending five species for planting wind breaks under irrigation: Persian Lilac, Chinese Lilac, Peking Cotoneaster, Glossy Buckthorn (also called Tall Hedge or Columnar Buckthorn), and Caragana.

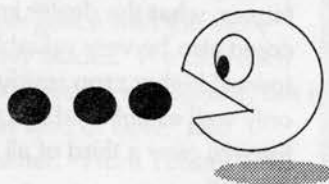
A publication on the specifics can be ordered for \$3.50 a copy. Order item FO-6042-NR from the Distribution Center, 20 Coffey Hall, University of Minnesota, St. Paul, MN 55108. Make check payable to University of Minnesota.

Atrazine-munching microbes found

Microbes already found in the soil are being harnessed to eat atrazine, one of the nation's most-used pesticides, and keep it out of water supplies.

These newly isolated atrazine-eaters are the first microbes found to thrive in high concentrations of the pesticide, and one of the first that leaves no potentially harmful by-products.

Most agricultural soils mineralize or completely break down less than 40 percent of the pesticide after one year. Added to atrazine-rich soil samples, the microbes ate 86 percent of the atrazine in just 150 days.



Atrazine is among four pesticides most commonly found in well water samples near farm chemical mixing and loading sites.

The researchers' next step is to find a way to apply the microbes to farm fields and pesticide spill sites.

For more information, contact Ronald F. Turco, (317) 494-8077 or Gary P. Carlson, (317) 494-1412.

Mail items for consideration in NEWSLINE and other sections of *Conservation Impact* to:

CTIC Editor
1220 Potter Dr. Rm 170
West Lafayette, IN 47906

FIELD NOTES



By Dan McCain
CTIC Field Specialist

"Smart dealers will arm themselves with information about products and performance before farmers come to request parts. For example, a farmer with worn out twisted shank chisel shovels might ask a dealer for identical replacements. This is the dealer's opportunity to express the value of sweeps or straight points that could help the farmer attain levels of crop residue that were previously difficult."

PUBLICATION



SERIES



Making compliance work



Cartoon provided by USDA SCS, Iowa

I hope you don't find yourself in Bill's shoes (see cartoon). Yet, even at this late date, I wonder if everyone clearly understands that farm conservation compliance practices must be fully implemented this year to meet the January 1, 1995 deadline. That date is no time to be in the field trying to apply practices, such as terraces, diversions or crop residue management.

Farmers and dealers

In this homestretch, experienced farmers will be of great value in helping other farmers because they've "been there" and know the pros and cons of different conservation systems.

The dealer is also an important information source for farmers trying to apply crop residue management systems (a requirement in 75 percent of farm conservation compliance plans). Like the farmer, what the dealer knows about crop residue management could also be very valuable to the pocketbook. The trend toward higher crop residue levels of 30 percent or more is not only well established but still growing! Such acres now account for well over a third of all those planted in the U.S. - quite a market!

A scenario

Smart dealers will arm themselves with information about products and performance before farmers come to request parts. For example, a farmer with worn out twisted shank chisel shovels might ask a dealer for identical replacements. This is the dealer's opportunity to express the value of sweeps or straight points that could help the farmer attain levels of crop residue that were previously difficult. This also allows operators to make changes comfortably and avoid hassles with the farm bill legislation.

Information you can use

CTIC has information about the capacity for ground engaging tools to leave or bury residue. We offer a *Residue Scorecard*, developed by the USDA Soil Conservation Service and the Equipment Manufacturers Institute (EMI), that lists nearly 100 special configurations and options. For a copy, simply send a stamped, self-addressed envelope to: Residue Scorecard, CTIC, 1220 Potter Drive, Room 170, West Lafayette, Indiana 47906.

Inputs Situation and Outlook Report available

Copies of the final issue of *Inputs Situation and Outlook Report* are available from the USDA Economic Research Service (ERS).

The October 1993 issue includes 10 articles covering topics related to crop production inputs, including: crop-land, energy, farm machinery, fertilizer use, pesticide use, tillage systems and seed use.

Special articles on pesticide use by tillage system and nitrogen fertilizer application timing are also highlighted in this final edition.

To request a free copy, contact Len Bull or Harold Taylor at (202) 219-0456.

Conservation Tillage - the TV series, continues

Tune to satellite: Galaxy 7 - Channel 13 (C-Band) from 7:30 - 9:30 p.m. Eastern Time or 6:30 - 8:30 p.m. Central to receive the following two programs:

January 24 - Corn & Soybeans, Soil fertility, insects, compaction, plus ridge-till

January 31 - Conservation Tillage for the Cotton Belt

The following program will be aired one hour later than previous offerings 7:30 - 9:30 p.m. Central. Note new satellite channel - Galaxy 7 Channel 3:

February 7 - Conservation Tillage for the Great Plains

For more information, contact Randal Reeder (614) 292-6648.

Clearing up the coultter confusion

Which coultter or combination of coultters works best? Ask Marion Calmer, farmer and owner of one of the few privately owned on-farm research centers.

Throughout the past year, Calmer's Agronomic Research Center in Alpha, Illinois has been working to answer that question by testing the performance of several coultter combinations run side-by-side to see which would work best.

Calmer tried several different scenarios of coultter arrangements on the planters, recording residue counts and speed of emergence behind each different coultter arrangement.

Different setups

His favorite setup? "We found the two ripples out front, followed by the 13 wave blade right on the row unit to be the best," says Calmer. "I really prefer the wavy coultter blade on the row because we need to do a bit of tillage right where we're going to place the seed."

Ripple coultters are usually the best choice for good soil penetration without disturbing the soil too much. Using the wavy coultter directly in front of the planter units gets the residue out of the row. This helps fracture and warm up the soil ahead of the planter units, which improves seed placement.

Calmer had the two 17" ripple coultters out in front staggered 6" apart and running

about 3.5" deep. The center planter unit-mounted 13 wave coultter was running 2" deep. By running with this setup, he experienced a 37 percent drop in residue. The complete findings of Marion Calmer's tests can be found in the graph on this page.

The basics

While there are differences in the residue cutting abilities of coultters, the size of the coultter blade and the speed at which it runs will determine its effectiveness.

Basically, the wider a coultter blade is, the more it is affected by ground speed (the faster you go, the more aggressive it gets). Wider coultters also provide more tillage and disturb more soil - especially when the soil is wet.

For wavy coultters used with planters, the more waves on the blade, the slower the ground speed it should be run. Coultters with more waves work the soil more aggressively and could have a tendency to throw more soil out of the seed trench at certain ground speeds.

Additional highlights

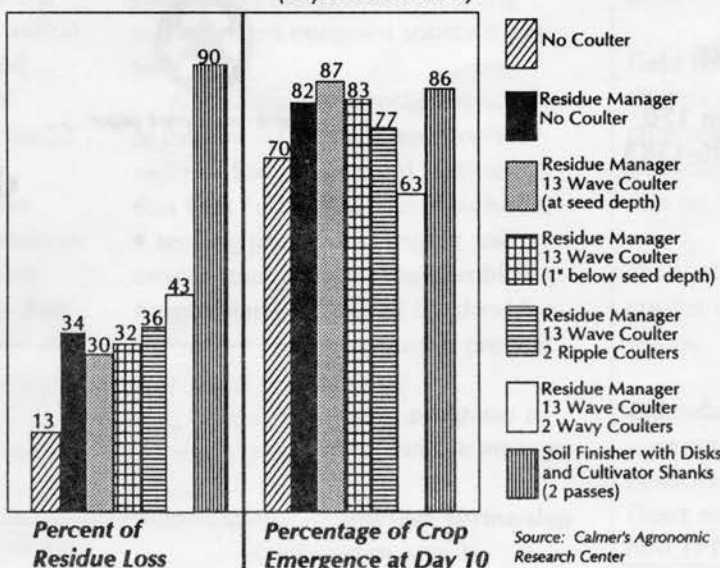
The runner-up of the

systems he compared was three wavy blades. This arrangement consisted of two 1" wavy blades out front running 3.5" deep with one 13 wave coultter blade in the center running 3" deep. The three wavy coultters tilled the soil more, but they also moved more residue, resulting in a 43 percent drop in residue levels.

Normally, the depth of the row mounted coultter is extremely critical. But due to the heavy rainfall this planting season, Calmer noticed something very different. Because the ground was so hard, running the center blade deeper than seed level actually helped improve the seedbed. "That's not always going to be the case. This was just one of those years where you could do it," says Calmer.

"When comparing the ripples and wavy to the three wavy blades, the other thing we noticed was the speed of emergence with the three wavy blades. We did reach 100 percent emergence, but it was kind of slow," said Calmer. - From Yetter's *The Leading Edge*, Vol. 2, No.1

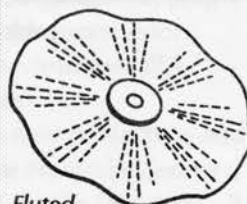
Planting with Different Coultter Arrangements
(soybean residue)



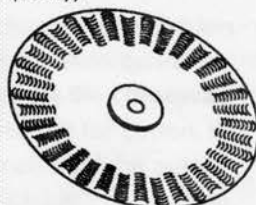
PRODUCT NEWS



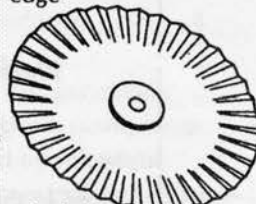
Common coultter styles:



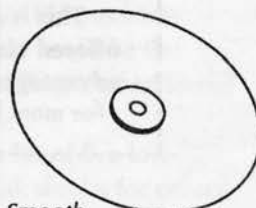
Fluted (Wavy)



Rippled with smooth edge



Rippled



Smooth

For more information about Calmer's Agronomic Research Center, write:
R.R. 1 Box 80
Alpha, IL 61413,
or phone:
(309) 334-2609,
or fax:
(309) 334-2696

Conservation Impact 7
January 1994

On the Calendar



January

For Crop Residue Management Conferences information, contact: George Csolak (314) 694-2916 or David Vincent at (414) 789-0900.

18-19

Crop Residue Management Conference, Rapid City, SD.

Tri-State Crop Residue Management Expo, Sioux City, IA. Contact: Joel DeJong (712) 276-2157.

25-26

Crop Residue Management Conference, Springfield, IL.

Jan. 30-Feb.3

National Association of Conservation Districts Annual Convention, Phoenix, AZ. Phone: 1-800-825-5547. **CTIC Forum: Conservation Tillage for Watershed Management, Feb. 2,** 9-11:30 a.m. at the convention.

Jan. 31 - Feb. 2

Manitoba-North Dakota Zero Tillage Farmer's Association Annual Workshop, Minot, ND. Contact: Lyle Samson, (701) 852-8895 or Dennis Haugen, (701) 769-2226.

February

1-2

Crop Residue Management Conference, Denver, CO.

9

When Conservation Reserve Program Contracts Expire... Alternatives and Policy Options, Hollis, OK. Contact: Mark Rose, Great Plains RC&D, (405) 562-4882.

10-11

When Conservation Reserve Program Contracts Expire... The Policy Options Arlington, VA. Contact: Soil and Water Conservation Society, 1-800-THE-SOIL.

10-11

Crop Residue Management Conference, Des Moines, IA.

15-18

The International Erosion Control Association 25th Conference and Trade Exposition, Reno, NV. Contact: IECA, P.O. Box 4909, Lincoln Ave., Suite 103B, Steamboat Springs, CO 80477-4904. (303) 979-3010.

22-23

No-till/Ridge-till Workshop, Etobicoke, Ontario. For more information, phone: (519) 767-3179.

27-Mar. 2

American Water Works Association/Water Environment Federation Water Reuse Symposium, Dallas, TX. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe St., Alexandria, VA 22314-1994. (703) 684-2400.

March

7-10

National Agricultural Pesticide Management Conference and Workshop, St. Louis, MO. Contact: Lyn Kirschner, Conservation Technology Information Center, (317) 494-9555.

\$\$ DISCOUNT COUPON \$\$

**National Agricultural Pesticide Management Conference
March 7-10, St. Louis, Missouri
for Conservation Impact readers only!**

Send in this coupon with your conference registration and claim the reduced rate of **\$90** when you register before February 18th!

This is a conference you won't want to miss, at a price that won't be offered elsewhere. Send your coupon in today and claim one of the advantages of being a *Conservation Impact* reader!

•For more information about the conference, contact Lyn Kirschner, (317) 494-9555.

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& SOIL RESEARCH

Farm Spending and Local Selling: How Do They Match Up?

John W. Chism and Richard A. Levins

Twenty years ago, rural sociologist Walter Goldschmidt predicted that "... if the production of agricultural goods is to become increasingly large scale and corporate dominated, rural communities as we know them will cease to exist." While perhaps extreme, this view persists today in many parts of Minnesota. Small towns are better off with smaller farms in their countryside. But is this view supported by research?

In this article, we present evidence that farm size and support of local businesses are indeed related. Our data also indicate that small towns looking to agriculture for sustenance should be at least as concerned about the enterprise mix of surrounding farms as they are about the size of the farms.

The Study

We analyzed the specific spending patterns of 30 farmers selected from the membership of the Southwest Minnesota Farm Business Management Association. Their farms were similar in size and enterprise mix to other full-time farms in the region, and each had a detailed farm-record system that allowed an item-by-item analysis of 1992 farm expenditures. For one-time expenditures on capital items such as equipment and buildings, purchase records for the previous four years were averaged.

We also interviewed each farmer individually to gain their perspectives

on local spending patterns. Farmers generally responded that larger farmers were less likely to spend locally. The reasons many gave in support of their opinions seemed compelling. For example, respondents thought that the more inputs a farmer purchases, the higher the total savings for a given per-unit price break becomes. Larger farmers, therefore, would have more incentive to search for such financial savings in non-local markets. Responding farmers also said that operators of

the largest farms were often able to devote more time to such management activities as shopping around for volume discounts. And, in some cases, the largest farms were said to require various specialized inputs that were simply not sold—at any price—within the local area.

We wanted to know if our surveyed farmers' spending actually supported these notions about the effects of farm

(See *Farm Spending* page 2)

Changing Fiscal Patterns for Minnesota County Governments

Beth Walter Honadle and Yin Wang

Minnesota's 87 county governments provide medical assistance and income maintenance for low-income individuals, various social services, public safety, property tax assessment and collection, state licensing, road and highway maintenance, solid-waste management, judicial and correctional services, and law enforcement—as well as other public services.

Many of these county services are mandated by the state and federal governments, and county governments

must provide them regardless of cost. Because the so-called "unfunded mandates" are increasing and because public demand for additional county services, especially public safety, sanitation, and health, are also increasing, fewer funds are available for local discretionary purposes.

The ability to finance local services obviously hinges on the county governments' ability to obtain revenues.

(See *County Governments* page 4)

John W. Chism and Richard A. Levins are former research associate and professor, respectively, Department of Agricultural and Applied Economics.

Beth Walter Honadle and Yin Wang are professor and research assistant, respectively, Department of Agricultural and Applied Economics.

Perhaps farmers spend money differently than do their in-town counterparts, or perhaps larger farmers spend differently than do smaller farmers. This, too, is a possible area for further study.

In Brief

There seems to be more to the farm size story than sales volume alone. When sales volume increases for a given number of acres, the most likely reason is that farming is becoming more livestock intensive. The shift to livestock may have potential benefits for local economies. However, as

livestock-intensive farms expand, community businesses may have difficulty capturing the additional dollars.

References

- Chism, J. W. 1993. Local spending patterns of farm businesses in southwest Minnesota. M.S. thesis. Dept. of Agricultural and Applied Economics, University of Minnesota, St. Paul.
- Goldschmidt, W. 1975. "A tale of two towns." In *The people's land*. Ed. P. Barnes. Emmaus, PA: Rodale Press.

(County Governments continued from page 1)

Property taxes are the main source of county government revenue, but they are increasingly unpopular. The other major revenue source, intergovernmental aid—transfers of funds from one unit of government to another—has declined, particularly from the federal government.

This article examines patterns in county revenues and expenditures from 1985 to 1991. Most of the revenue and expenditure data we provide here is a statewide aggregate; for any individual county, financial trends may vary significantly. To illustrate, we also examine the finances of Wabasha County, chosen because it is the site of a Minnesota Extension Service pilot project in public finance education.

The analysis for this article is based on revenue and expenditure data reported annually by the county governments to the state auditor. The most recent year for which data are available is 1991. All time-series are presented in constant 1991 dollars, to mask the effects of inflation.

Overview

County revenues over the 1985-1991 period are characterized by relatively heavy reliance on property taxes and intergovernmental aid (mostly from the federal and state governments). Over this period dependence on property taxes increased slightly while intergovernmental aid declined. Direct grants from the state government increased as a proportion of

intergovernmental aid, but still declined as a proportion of total county revenues.

County government spending for this period has been concentrated on human services, followed by general government, public safety, and highways. By 1991 public safety had moved into third place, overtaking highway spending as a proportion of total county spending.

Revenues

County governments administer many programs of direct interest to state and federal policymakers, especially human service programs. Counties receive major intergovernmental financing for some of those programs.

Table 1 presents proportions of total county revenues from all sources (except borrowing and the operations of county enterprises). In 1985, 53 percent of Minnesota county governments' revenues were from intergovernmental aids with the rest raised by the county (own-source revenues). By 1991 the

picture had reversed with 54 percent of county revenues coming from county sources. Most of this change was attributable to a drop in federal grants.

Own-Source Revenues

Own-source revenues for Minnesota county governments come from property taxes, service charges, interest earnings, and fines and forfeits (in descending order by their contribution to the whole), as well as miscellaneous other sources.

Property taxes grew from 32 percent of total revenues in 1985 to more than 36 percent in 1991. Despite the growing unpopularity of the property tax, county governments continue to rely heavily on this, their only tax source.

The unpopularity of property taxes, along with the decline in intergovernmental revenue, has led to greater reliance on user charges. User fees and charges are the fastest growing source of locally raised revenue. They are "voluntary" fees (as opposed to taxes) for publicly-provided goods and services, including rental of government buildings, road and bridge services, and recreation fees. As a proportion of locally raised revenue, user fees and service charges grew 3.1 percent per year over the period. Due to a drop in other revenue sources such as intergovernmental grants, user fees and service charges actually grew by 5.2 percent per year, measured as a proportion of total revenue. Minnesotans were paying \$32 per person on charges for county services in 1985, but paid \$46 per person in 1991.

Intergovernmental Revenues

In 1985 more than half of county revenues came from intergovernmental aid. At that time almost 19 percent of total revenues came from the federal government and 33 percent came from the state. Revenue from the state has not

Table 1. Minnesota County Revenue Sources as a Percentage of Total Revenues: 1985-1991

	1985	1986	1987	1988	1989	1990	1991
Own-Source Revenues							
Property Taxes	32	32	36	36	35	34	36
Service Charges	5	5	6	7	7	7	7
Interest Earnings	5	4	3	3	4	4	4
Fines and Forfeits	1	1	1	1	1	1	1
Other	4	11	5	5	4	4	6
Total Own Source	47	53	51	52	51	50	54
Intergovernmental Revenues							
State Grant	33	30	32	32	33	34	32
Federal Grant	19	16	16	15	15	15	13
Local Unit	1	1	1	1	1	1	1
Total Intergov. Rev.	53	47	49	48	49	50	46

changed significantly; in 1991 it was 32 percent. However, the federal government's share has dropped to 13 percent. This was mainly due to the decline in federal grants, including the elimination of federal general revenue sharing in the latter half of the 1980s. In addition, more stringent federal requirements (such as recent drinking water standards issued by the Environmental Protection Agency) have contributed to the decline.

Expenditures

The biggest current-expenditure items for county governments are human services, general government administration, public safety, and highways. Nearly 87 percent of all county spending is accounted for by these four functions. The map (figure 1) shows the percentage change in spending per person for each county in Minnesota. Figure 2 shows the general categories of county government spending, while figure 3 details the largest category, human services. Figure 4 shows that, within human

services, the pattern of expenditures has changed.

Human Services

As figure 2 demonstrates, nearly half of all county spending is on human services. Human services include two major components: transfer payments and social services.

Figure 3 shows human services spending statewide, by type of service, for our analysis period. We used the Minnesota state auditor's categories. Aid to Families with Dependent Children (AFDC) is a federal-state

Figure 1. Changes in County Government Spending per Person: 1985-1991

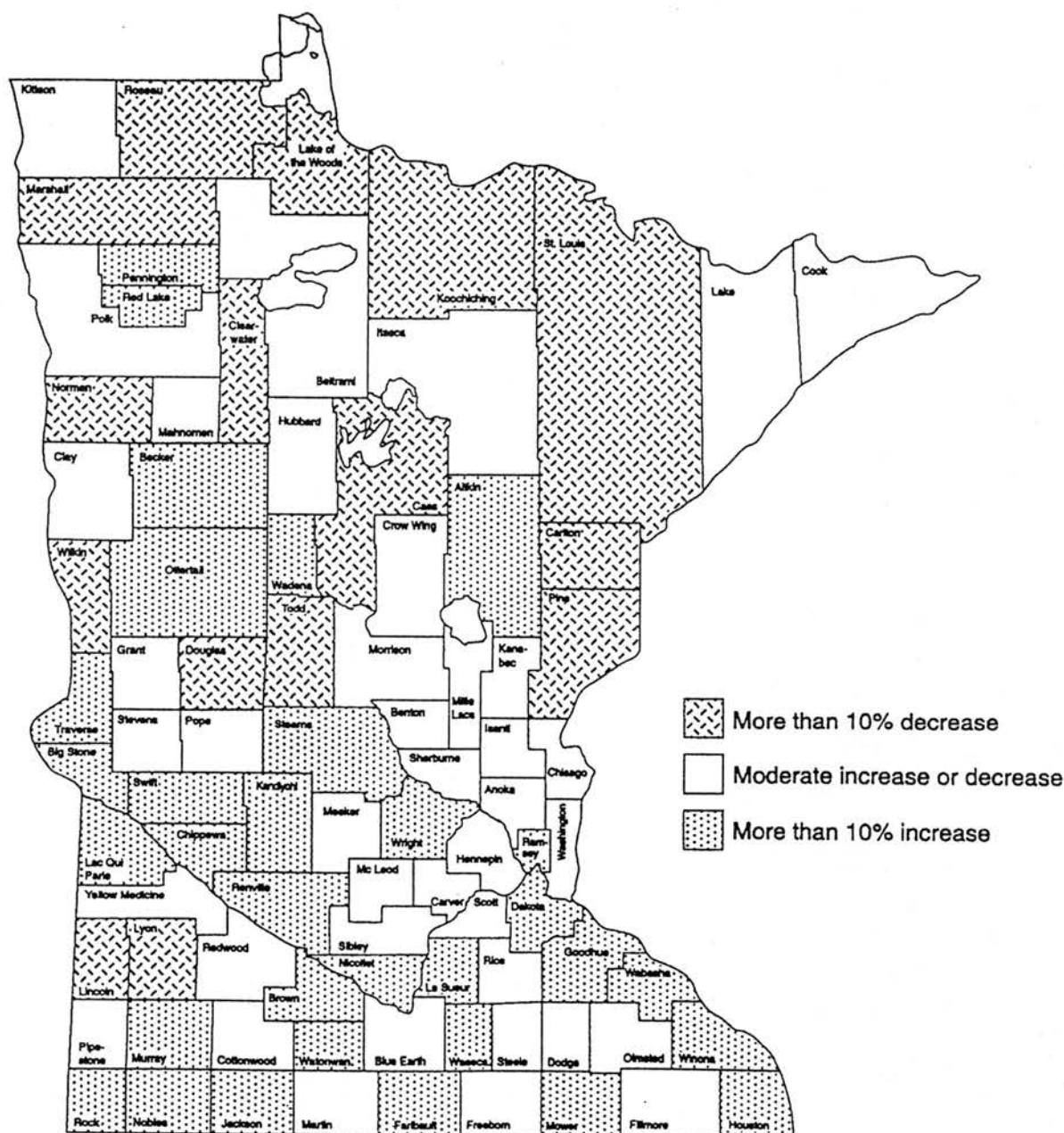


Figure 2. County Government Spending by Category: 1991

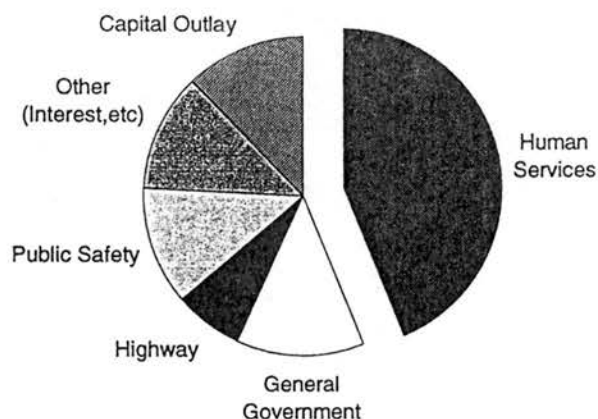


Figure 3. County Human Services Spending: 1991

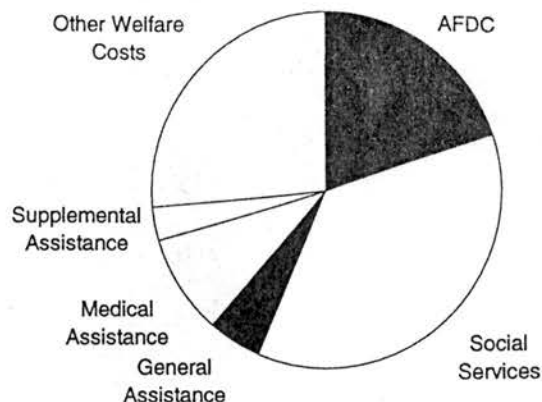
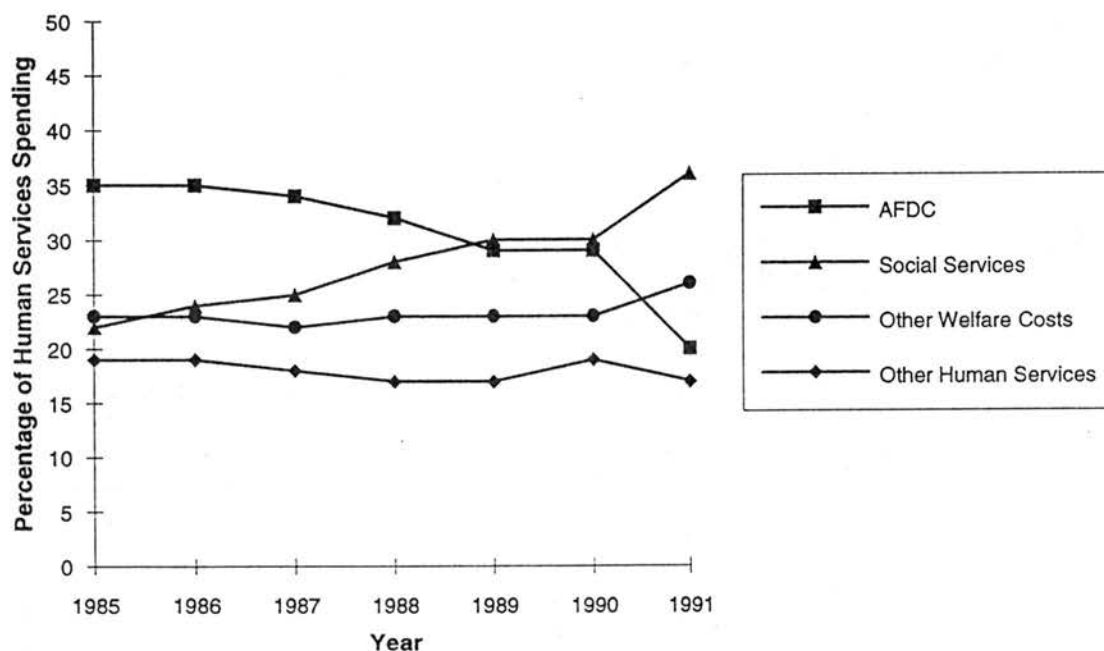


Figure 4. Changes in County Human Services Spending: 1985-1991



program that provides cash assistance to families in need. Social services includes assistance for alcoholism, drug abuse, and mental illness. General assistance is a state program that gives cash assistance to persons who are not eligible for federal assistance programs, but who are unable to provide for themselves. Medical assistance provides for the health care of low-income persons. Supplemental aid assists the needy, aged, and disabled.

AFDC spending, as a percentage of total human services expenditures,

steadily declined, from 35 percent in 1985 to 20 percent in 1991. In contrast, social services spending has risen steadily from 22 percent in 1985 to 36 percent by 1991. The significant 1990-91 drop in the relative size of AFDC expenditures may reflect a shift in how the state reimburses counties for human services costs.

Public safety spending (mostly county sheriffs' departments) increased each year. In 1985 public safety ranked fourth in percentage of county expenditures. By 1991 it had moved to third

place, replacing highway spending. This does not necessarily mean that county governments have decided to spend more on the police function, because county governments receive payments from townships and cities to provide services to their areas. Highway spending not only depends on the number of people living within a county government's jurisdiction, but also depends on the total miles of county-maintained highways, the total volume of traffic carried by those highways, and highway quality.

Other Current Spending

Table 2 shows county spending statewide that is not included in the human services, general government, capital outlay, public safety, and highway categories. These other expenditures combined account for about 10 percent of county spending annually. Health, natural resources, library, and related expenditures are

the leading categories of "other" expenditures in county governments. Sanitation-related spending (mostly solid waste management) rose, however, from two dollars per person (in 1991 dollars) in 1985 to seven dollars per person in 1991—a 250 percent increase. This reflects a large infusion of state funds for solid waste management, financed by the state sales tax.

Conclusion

Between 1985 and 1991, county governments became less dependent on intergovernmental aids, especially from the federal government. Increased property taxes and fees for services made up the difference. Human services remain far and away the biggest share of expenditures by the county governments. However, there have been shifts within this broad functional category in how the money is spent.

County governments continue to provide services required by the state and federal government, but increasingly have to raise the dollars locally to pay for them. This can obscure the connection between taxing and spending decisions. It may also reduce the accountability of local government officials to local residents.

Table 2. "Other" Minnesota County Spending (in 1991 Dollars) per Person: 1985-1991

	1985	1986	1987	1988	1989	1990	1991
Sanitation	2	2	3	4	5	7	7
Health	18	17	19	20	22	22	23
Libraries	9	9	9	9	9	9	10
Park	5	5	5	5	6	6	5
Natural Resources	10	10	11	9	10	8	9
Econ. Development	4	3	3	3	5	6	5
Miscellaneous	6	5	5	4	4	5	4
Total Other	54	51	55	54	61	61	63

Wabasha County Government Finances

Wabasha County receives a larger share of its revenues from state grants than the statewide average (table 3). The leading source of locally raised revenue (as it is for all Minnesota county governments) was the property tax, which in 1991 raised \$146 per person. That amounted to a one dollar decline over the seven-year period, while statewide property taxes increased an average of \$67 per person. The property tax accounted for 32 percent of total revenue, slightly less than the statewide average. As proportion of total revenue, charges for services rose from 5.2 percent in 1985 to 7 percent in 1991, also slightly less than the statewide average.

Wabasha county's per-capita spending (table 4) follows a pattern similar to statewide data. Spending on social services accounted for a larger percentage of total human services spending than statewide. Welfare spending, on the other hand, accounted for a smaller portion.

Table 3. Revenue Sources as a Percentage of Total Revenues: 1985-1991 (In 1991 dollars)

	1985	1986	1987	1988	1989	1990	1991
State Grants	43	42	47	44	48	53	43
Federal Grants	16	15	12	15	15	11	12
Local Unit	0	0	0	0	0	0	0
Intergovernmental Revenue	59	57	59	59	63	64	55
Own-Source Revenue	41	43	41	41	37	36	45

Table 4. Expenditures per Capita: 1985-1991 (In 1991 dollars)

	1985	1986	1987	1988	1989	1990	1991
General Government	61	58	70	72	75	76	64
Public Safety	50	46	45	45	48	49	51
Highway	67	122	84	91	86	88	89
Human Services	159	164	182	179	187	174	186
Capital Outlay	23	85	114	113	112	134	34
Other	36	34	33	46	36	52	44
Total Expenditures	396	509	528	534	544	573	468



Board member Update

June 1994

The mission of the Board of Water and Soil Resources is to provide leadership enabling local governments to properly manage water and soil resources and to help all citizens be stewards of our irreplaceable natural resources.

Southern Region

- Wetland Conservation Act (WCA) activities in the southern region are picking up:
 - The New Ulm, Marshall, and Rochester BWSR field staff assisted BWSR Water and Land Section Administrator Greg Larson with delineation of wetlands on a farm recently acquired by the U of M Waseca Experiment Station. This acreage will be the location of the September advanced wetland delineation session for local government units (LGUs) in southern Minnesota. A big "thank you" is extended to the Waseca Experiment Station for this opportunity. Greg and University of Minnesota Professor Jay Bell also provided some needed insight into identifying hydric soil characteristics in molisols which are typical throughout southern Minnesota.
 - Board Conservationist (BC) Tom Fischer participated in technical evaluation panel (TEP) meetings to discuss proposed activities, wetland banking, and violations. LGUs continue to ask questions and seek advice.
- Tom also assisted the Nicollet County TEP and two regional DNR staff in conducting a wetland delineation along the bluff area of the Minnesota River just east of New Ulm. This area was quite a challenge due to its non-tilled soils and native-prairie-like setting. As a result of the delineation and the discovery of several prairie/wetland species, there will be very minimal wetland impact within the proposed work area (a gravel and clay mining operation).
- BWSR Wetlands Specialist John Jaschke and Assistant Attorney General Matthew Seltzer led a joint meeting of McLeod County parties to further discuss the McLeod County violation. Things seem to be progressing, and hopefully a mutual agreement within WCA Statute will be reached soon. If not, a court appearance will probably be scheduled in the near future.
- The Area VI employees staged a well-attended Envirothon. Teachers and students submitted many positive comments. The New Ulm Cathedral High School won in the state competition and will move on to the national level.

- Legislation regarding feedlots was a topic at a South Central 13 County Water Planners meeting. Water plan coordinators discussed inventory forms for feedlots and state funding based on feedlot inventories.
- Chris Hughes, New Ulm BC, spent quite a bit of time working on local water plan interface installations this past month. While this remains a low priority, it is an opportunity to introduce the EPPL7 interface to local government and continue to work toward establishment of GIS user groups. The system will be useful for watershed projects such as the Blue Earth River Basin Initiative (BERBI) as they record and analyze their implementation efforts.
- Chris attended the Martin and Blue Earth SWCD board meetings during May. Long lines of potential candidates for the Reinvest in Minnesota (RIM) and Permanent Wetland Preserves (PWP) programs exist. There seems to be a lot of interest in the State Revolving Fund (SRF). Everyone has questions about it but we don't have much information as yet.
- BERBI has hired an engineering technician utilizing BWSR funds from the Special Minnesota River Basin Fund. Nichole Van Valkenberg is a recent graduate of the University of Minnesota. She has a B.S. degree in agricultural engineering. Nichole will be working out of the Faribault SWCD office. She will provide technical assistance, particularly design development, for projects funded through the Special Minnesota River Basin Fund. The BERBI encumbered \$75,837 of the Special Minnesota River Basin Fund at its May meeting. The dollars will fund 12 projects in high priority areas of the basin. Projects will accomplish 6.53 acres of critical area seeding, one animal manure management sys-

tem earthen basin, 17.74 acres of grassed waterway, and one water and sediment control basin.

- The BWSR recently received a Partnership Minnesota Cooperative Public Service Award from Governor Arne Carlson for its involvement and support of the Heron Lake watershed project. Although there are many partners in the Heron Lake project, BWSR has played (and will continue to play) a major role in watershed management through its existing and future programs.
- The Upper Minnesota River Watershed District will host the annual Minnesota Association of Watershed Districts' summer tour on June 24th and 25th. Part of the tour will include a wetland delineation demonstration for the expected 80 participants. Board Conservationist David Sill, Big Stone SWCD Technician Gary Hoffman, and Upper Minnesota River Watershed District Administrator Diane Radermacher recently assisted Greg Larson in site selection, delineation, and material preparation for the delineation demonstration/training exercise.

Land and Water Section

- Doug Thomas, water plan coordinator, has been busy organizing the first ever Local Water Planning Conference. Water plan coordinators and other interested parties from around the state have been invited to the conference, which will be July 27-28 in St. Cloud. The conference focuses on local programs and successes.
- Doug is helping administer a \$29,000 grant from the EPA to develop a wetlands module for the Local Water Planning GIS Interface. This module will allow local governments to quickly assess different wetland functions. The Coon

Creek Watershed in Anoka County will be the pilot area for this project.

- BWSR Computer Specialist Bryan Alpaugh has spent a considerable amount of time recently working on the development of a RIM Data Base as part of the overall RIM re-tooling project. The data base will allow for the efficient organization of RIM data. Bryan has also been busy developing an interactive computer display for this year's State Fair. The display will focus on providing wetlands information by county.
- Dave Behm, programs and policy analyst, has completed a draft copy of the BWSR soil loss initiative based on input from the soil loss committee. Participants included local government, farm organizations and state and federal agencies. A possible consequence of this effort may be legislation to address the --long ignored--soil resource. The next step in the process will be to distribute the report to BWSR members a final review draft by July 1.
- The RIM/PWP rule revision has been noticed in the State Register.
- Hydrogeologist Eric Mohring is administering a \$500,000 grant BWSR secured from the federal government through the flood disaster program to provide well-sealing cost-share monies to landowners within the declared flood disaster counties in 1993. Eric also participated in a well-sealing demonstration for the LCMR Commission on Monday June 20th in Dakota County; he will be presenting a proposal for well-sealing money to the LCMR on behalf of BWSR in June.
- The Land and Water Section has hired Dionne Benson, a U of M environmental studies student, as a student worker.
- Grants Coordinator Wayne Zellmer is the lead staff person involved in discussions with the Minnesota Department of Agriculture on implementation of the State Revolving Fund. As with any new effort involving many agencies, a number of details must be addressed. Consequently, implementation is several months away. We will provide monthly progress reports.
- Wetland Management Specialist John Jaschke continues to devote considerable time assisting field staff, LGUs and the public with questions concerning implementation of the WCA. John and Land and Water Section Administrator Greg Larson have devoted over 200 hours organizing interagency wetland delineation training sessions for LGUs. Six sessions totaling 14 days are scheduled for this summer and fall.
- Greg has been involved in the discussions necessary to implement the Clinton administration wetland initiative. Although that initiative focuses on the SCS, EPA, Corps of Engineers and the Fish and Wildlife Service, we have been involved to ensure that efforts such as programmatic permits are considered. Greg will be addressing the National Research Council Wetland Characterization Committee at their meeting in Jamestown, North Dakota, on June 23. Congress asked that committee to assess wetland delineation and functional assessment. The committee's report is due this October.

Northern Region

Spring has sprung

Summer is here

Look out for that jet ski

It'll clip off your ear.

That's right, it's tourist time in northern Minnesota. So what's new? Let's take a look.

- Keith Grow, Brainerd BC, reports that about 70 percent of his time is spent on WCA issues and 20 percent on the Snake River Joint Powers. Things are going well with the Snake River bunch. You can look forward to a report at an upcoming board meeting. Keith also gave a presentation at Lakes Day in the town of Big Lake. He targeted his lake protection strategy talk to the lake association members present.

- Our other Brainerd BC, Dan Steward, is excited about a partnership building workshop he and others are planning for September 14. This session will be a take-off on last year's successful coalition building workshop. The theme this year will be "Building Local Capability to Manage Water." Stay tuned for details. Dan also reports a busy WCA workload in May.

- Up in Bemidji, BC Dale Krystosek's WCA highlights include assisting the DNR regional office in Grand Rapids to evaluate potential wetland impacts for a proposed fish hatchery. He also coordinated a meeting of BWSR northern board conservationists and the Brainerd Army Corps to discuss wetland regulatory issues. This was a very insightful meeting. Dale has also been assisting the MASWCD Area II association in planning for this year's state convention.

- Duluth BC Mark Nelson participated in the Ecosystem Management System for Lake Superior Conference in Duluth. Over 700 hundred people from around the country attended the conference. Mark worked with the Lake Superior Association of SWCDs to host a tour of urban conservation sights in and around Duluth as a part of this conference.

- Also in Bemidji, BC Brian Dwight continues his efforts to communicate with the five northern counties that refuse to

adopt WCA. Brian has been doing yeoman's work with this group. Tim Hvidsten and Ted Lovdahl have run some valuable interference for BWSR staff--commissioners seem more willing to listen to one of their peers rather than another state employee at times.

Anyhow, the counties are talking with us and I predict we'll be able to make some progress on this issue, although the progress may be slow.

- Duluth Forester Jim Lemmerman assisted South St. Louis SWCD with willow post plantings along Miller Creek in Duluth. Miller Creek is a brook trout stream running through a very developed urban area. Jim also coordinated some forest wetland training for northern BCs. BCs looked at forest wetland soils with the Soil Conservation Service (SCS) area soils scientist and discussed forest practices and their impact on wetlands with Jim. It was a very informative day and we will probably do more such training in the future.
- Staff members have been working with Barb Uppgaard to plan a July BWSR tour for the Crow Wing/Cass counties area. We'll be meeting at Craguns July 27 and 28 with a tour of some nearby sights. We hope to show some of the development and agricultural threats to water quality in this part of the state. Should be an interesting two-day event--looking forward to having you all up here in July.

Engineering and Technical Services Section

Conservation Easements

- The first draft of the retooled program handbook was distributed to the retooling team members for review near the end of May. The general response was very favorable. Marybeth Block, easement coordinator, and Tom Wenzel,

design engineer, are leading the efforts to finalize individual sections of the handbook and get them to the printers. The retooled application sections will be ready for use by SWCDs next month, so that applications for the fall funding cycle can utilize the new streamlined procedures.

Lakeshore engineering

- Lakeshore Engineer Gene Clark and Chief Engineer Al Kean have been collaborating to develop final designs for the Two Harbors Campground and Sewall shoreline stabilization projects in cooperation with the So. St. Louis and Lake SWCDs.
- The Sucker Bay shoreline stabilization project is on track to start construction in July. Gene will provide construction inspection assistance to the landowners and So. St. Louis SWCD.
- We recently submitted grant applications to the Great Lakes Protection Fund and Great Lakes Commission for a technician position which would work with Gene to provide accelerated technical assistance to SWCDs and other LGUs in the Lake Superior watershed. A technician would substantially increase Gene's capability to provide lakeshore engineering assistance.

Feedlots

- Brad Matlack, feedlot specialist, recently met with SWCD, SCS and Pollution Control Agency (PCA) staff at two problem feedlot sites in Redwood County (Paskowitz brothers) to help determine what alternatives exist for feedlot pollution abatement at these difficult sites. Brad will also help prepare an alternatives analysis report.

- Brad continues to work with the Redwood Clean Water Partnership and Blue Earth River Basin Initiative (BERBI) to develop a feedlot training program for new technicians hired by these projects.

Area II

- HDR Engineering continues to conduct analyses necessary for the Environmental Assessment Worksheet (EAW) for the RW-22 project.
- Darrell Apelgrain, BWSR Area II engineer, will host several upcoming meetings involving county engineers, DNR staff, Department of Transportation staff and Area II staff, to develop guidelines for road retention projects. This was a recommendation of the inter-agency flood hazard mitigation team assembled last summer after the floods.

Other engineering activities

- Al Kean provided two BWSR Engineering Advisory Reports for watershed district projects during the past month. Al also prepared plans and specifications for a streambank stabilization project in Morrison County. He has several other such technical assistance projects on the drawing boards.
- Al has been working with John Brach, SCS state conservation engineer, to help develop a "Conservation Partnership Technical Advisory Committee" to assist with identification of staffing needs and options, and other ways to improve technical assistance partnering. The Minnesota Association of Soil and Water Conservation Districts (MASWCD) and the Minnesota Association of Conservation District Employees (MACDE) have been asked to participate on this committee, which would also develop recommendations for staffing via the recent State Revolving Loan Fund (SRF) implementation appropriations.

Manure Management:

PRACTICES FOR THE MINNESOTA PORK INDUSTRY

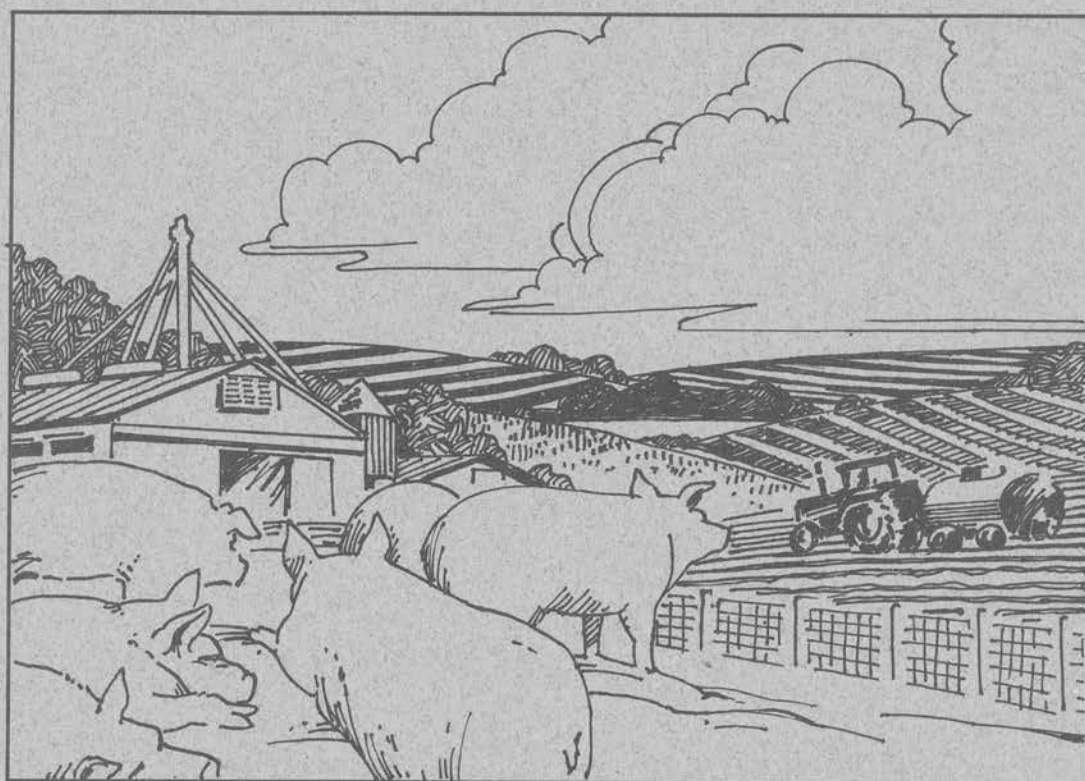


Table of Contents

Foreword	1
Introduction	2
Manure: The Environment and Human Health	4
Nitrogen	4
Phosphorus	6
Raw manure	6
Health risks	6
Odor	7
Manure: Management for Environmental Protection	8
Site selection and public relations	9
Manure production	10
Manure collection	12
Manure storage	14
Manure treatment	17
Manure utilization	18
Dead Pig Disposal	21
Summary	22
Appendices	
Appendix A. Publications	23
Appendix B. Agencies	24
Appendix C. MPCA permit application sample form	26-27
Appendix D. Testing laboratories	28
Glossary	29
Index	32

Authors:

David Schmidt and Larry Jacobson
Agricultural Engineering Department
University of Minnesota

For additional copies, contact
the Minnesota Pork Producers Association
at (507) 345-8814.

Task Force Members

Agricultural Utilization Research Institute
— Jack Johnson

Blue Earth County Zoning Office
— Rick Hanna

Board of Soil and Water Resources
— Jeff Nielson

Commercial Applicator — Gary Martens

Land Stewardship Committee
— Paul Homme

Minnesota Board of Animal Health
— Keith Friendshuh

Minnesota Corn Growers Association
— Jerry Janzig

Minnesota Department of Agriculture
— Doug Gunnink, Bruce Montgomery

**Minnesota Department of Natural
Resources** — Wayne Edgerton

Minnesota Extension Service
— Lowell Busman, Bob Koehler

Minnesota Pollution Control Agency
— Kim Brynildson

Minnesota Pork Producers Association
— Duane Bakke, Lynn Green, Jon Helvig,
Charlie Woehler, Dick Nicolai, Marlin
Pankratz, Pat McGonegle

Minnesota Project — Beth Waterhouse

Soil Conservation Service
— Jeff St. Ores

Townships Association
— Lothar Wolter Jr.

University of Minnesota
— Chuck Clanton, Phil Goodrich, Larry
Jacobson, Bill Lazarus, Dick Levins, Gary
Dial, Gyles Randall, Mike Schmitt

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MINNESOTA EXTENSION SERVICE
UNIVERSITY OF MINNESOTA
COLLEGE OF AGRICULTURE

Manure Management: Practices for the Minnesota Pork Industry

Foreword

Manure is an inevitable by-product of pork production. Pigs in Minnesota generate approximately 11 million tons (wet basis) of manure annually. This manure contains 73,000 tons of nitrogen, 55,000 tons of phosphorus equivalent fertilizer and 58,000 tons of potassium equivalent fertilizer. Manure management plays a critical role in determining how these nutrients impact crop production and environmental pollution. Because of this, manure management is becoming a major factor in local, national, and international pork production.

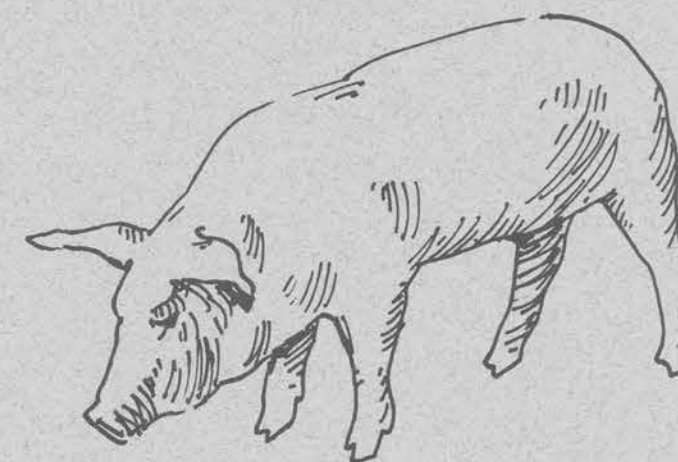
The Future of Waste Management: Strategies and Practices for the Minnesota Pork Industry is a project that began in July, 1992. The project was initiated to assist the Minnesota pork industry in taking a proactive approach toward environmental issues surrounding its waste management practices. The primary goal of the project was to identify waste management practices for the pork industry that were economically feasible, technically viable, and environmentally sound. Secondly, these management practices needed to be effectively promoted throughout the industry and to the general public.

The project began with a mail survey of 699 randomly selected Minnesota pork producers. This 36-question survey examined a variety of current waste management practices. Survey responses were used to identify current waste management practices in Minnesota. A 30-member task force, made up of representatives from the pork

industry, regulatory agencies, environmental groups, and university specialists, was then formed to identify environmentally sound waste management practices to be adopted by the Minnesota pork industry.

This publication identifies the major principles involved in managing manure to protect the environment and offers some general manure management guidelines. Since each producer's situation is unique, these management practices must typically be modified or adapted for each production site.

This publication does not attempt to give specific or detailed information on any particular system or practice. Detailed information is available through publications listed in Appendix A or from the Minnesota Extension Service, other state agencies or private consultants.





"Why is everyone so concerned about manure?"

"Manure has been around for centuries and no one cared — why is it a problem now?"

"Manure is organic, it's natural — so how could it pollute?"

"My father and grandfather farmed this land — they had no problems with polluting the environment — I'm doing things the same way — so what's the big deal?"



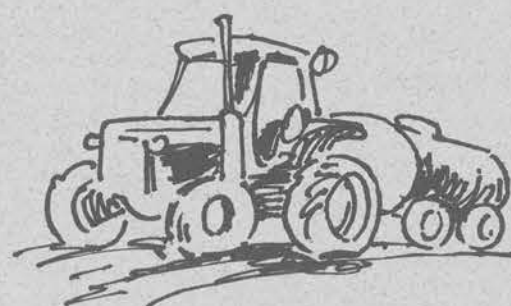
Introduction

Often when it comes to manure management, producers feel that the negative environmental impact of manure occurs only in the mind of the environmentalist and government regulator. The reality is manure has the potential to be either a valuable resource or a major pollutant, depending on how it is managed.

Environmental Management Practices

Manure management in the livestock industry has recently received a great deal of attention. Focus on this issue has occurred for several reasons. Advances in science have clarified the connection between manure and pollution. In some situations, declining water quality has been linked to poor manure management. Focus on manure management is also the result of the public's increasing environmental concerns. For much of the public the words *manure* and *pollution* have become synonymous. Because of these actual and perceived problems with manure, the public is demanding producer accountability in regard to manure handling. This accountability is being forced through new regulations, lawsuits, and negative media coverage. Proper manure management is therefore a key element in the survival of the pork industry in Minnesota.

Methods of handling manure and other farm waste in the most efficient, environmentally sound means possible are referred to as environmental management practices (EMPs). Although the management techniques presented in this publication are primarily concerned with managing manure from the source (the pig) to the end use (typically, utilization by crops), there are other farm wastes that must be handled properly. These waste products include needles, bottles, bags, paper, pesticides, and



so forth. Proper disposal, reuse, and recycling of these wastes must always be a priority.

Many pollution problems can be addressed through environmental management practices. These management practices primarily benefit the environment, but in most cases, will also contribute to farm profitability.

Added Value of Environmental Management Practices (EMPs)

Recognizing the value of implementing EMPs is essential for pork producers. Manure is often seen only as a liability, and indeed, substantial costs are involved in the handling of manure. Many or most of these costs will be there whether manure is handled properly or improperly. Some of these costs can be recovered by recognizing and handling manure as a resource. Not all benefits from using EMPs will be profitable in the short term, but in the long term, producers will benefit.

Manure, a valuable resource. Manure, when applied to cropland, provides the crop with nitrogen, phosphorus, potassium, and trace minerals. These nutrients and minerals can be used to partially or totally replace crop fertilizer needs. Manure applications also increase soil organic matter, improve soil tilth, stimulate microbial activity, and add to the general health of the soil. Producers are using EMPs to maximize the nutrient benefits of manure applications.



Manure, a liability. Several court cases have resulted from improper manure management. Using EMPs and following current regulations may reduce the risk of a costly nuisance suit. Manure liabilities are also a concern when producers seek financial assistance. Many lending institutions now consider manure management practices in their loan evaluation process.

Manure, a polluter. Environmentally sound manure management techniques reduce this pollution risk. Producers use EMPs because they are thinking of their families' or their communities' health, realizing that poor manure management practices may pollute their own or their neighbor's drinking water. Use of EMPs also benefits those who use Minnesota's lakes and streams for swimming and fishing.

Do the right thing. Mismanaged manure does not necessarily result in immediate environmental disaster. Using EMPs may actually result in short term economic losses. Why then are producers using EMPs? Many producers feel the benefits of using EMPs include the peace of mind, knowing that they are doing "the right thing" as stewards of the earth, both now, and for future generations.

The role of manure management in pork production will continue to be an issue for years to come. Therefore, it is important to understand how manure management practices affect both farm profitability and the environment.



Manure: the Environment and Human Health

The primary factor in swine manure's negative influence on human health and the environment is nutrients. When properly managed, manure nutrients can be a vital asset in crop production. When improperly managed, manure nutrients, primarily nitrogen and phosphorus, are potential pollutants of air and water (Figure 1.) Understanding how or why manure nutrients pollute is the first step to maximizing manure benefits and minimizing manure liabilities.

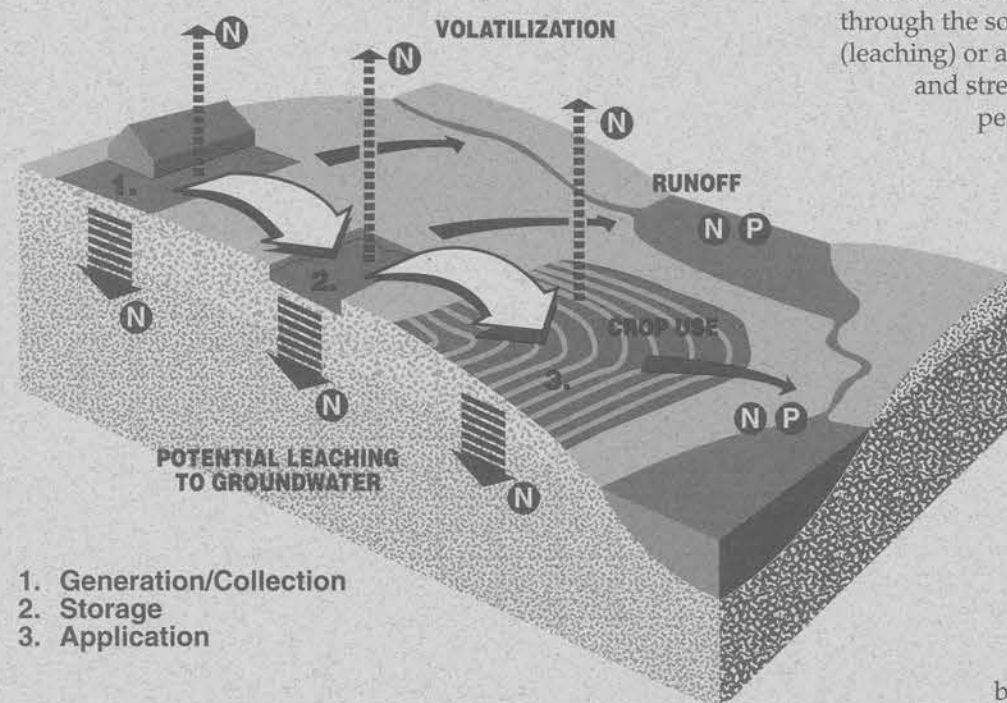


Figure 1. Potential hazards in manure handling

Nitrogen

Nitrogen is a vital chemical element found in all living things. Nitrogen makes up 78% of the air we breathe and is an essential plant nutrient. Why, then, does nitrogen present such a problem?

Nitrogen's pollution potential is dependent on its chemical form and its location in the environment. Nitrogen is continually changing chemical forms and moving through plant, animal, soil, water, and air systems. These transformations of nitrogen are known as the "nitrogen cycle" (Figure 2).

In some stages of the nitrogen cycle nitrogen is in the form of nitrate (NO_3^-). Any nitrogen source, including the nitrogen found in manure, can be transformed to nitrate.

Nitrates in topsoil are used by plants as an essential nutrient. However, nitrates are also soluble in water and can be carried through the soil profile to groundwater (leaching) or across the soil surface to lakes and streams (runoff). Soil texture, soil permeability, and land topography are primary factors influencing leaching and runoff. The potential for leaching or runoff from any soil increases when the amount of nitrogen applied to the cropland exceeds crop needs (Figure 3).

Nitrate-contaminated water poses a health risk when it is consumed by humans or animals. Health problems associated with nitrate result primarily after nitrates enter the body and are converted by bacteria to nitrite. High nitrite levels cause a condition known as methemoglobinemia. Methemoglobinemia, also known as "blue baby" syndrome, reduces the

ability of blood to carry oxygen and has caused infant illness and infant death. Because groundwater makes up a large portion of Minnesotans' drinking water, nitrates in groundwater is a real and valid concern.

Nitrogen can also be found in the form of ammonium (NH_4^+). Like nitrate, ammonium is a form of nitrogen available for plant growth. However, ammonium can also be volatilized, i.e., transformed to ammonia and released to the atmosphere. Ammonia volatilization contributes to the acidification of soils, lakes, and streams. Human exposure to high concentrations of ammonia in confinement facilities will cause irritation of the eyes and nose. High concentrations of ammonia in confinement facilities has been shown to reduce pig performance. Major factors influencing ammonia volatilization in confinement facilities are the nitrogen concentration in the manure, the pH of the manure, and manure's exposure to air.

Pig manure contains various chemical forms of nitrogen, some in the organic form (proteins, amino acids, urea) and some in the inorganic form (nitrates, ammonium, and ammonia). Relative amounts of nitrogen in each form depend on several factors: temperature, moisture, pH, exposure to air, nitrogen concentration, oxygen concentration, and carbon:nitrogen ratio. Changes in any of these factors affect both the total

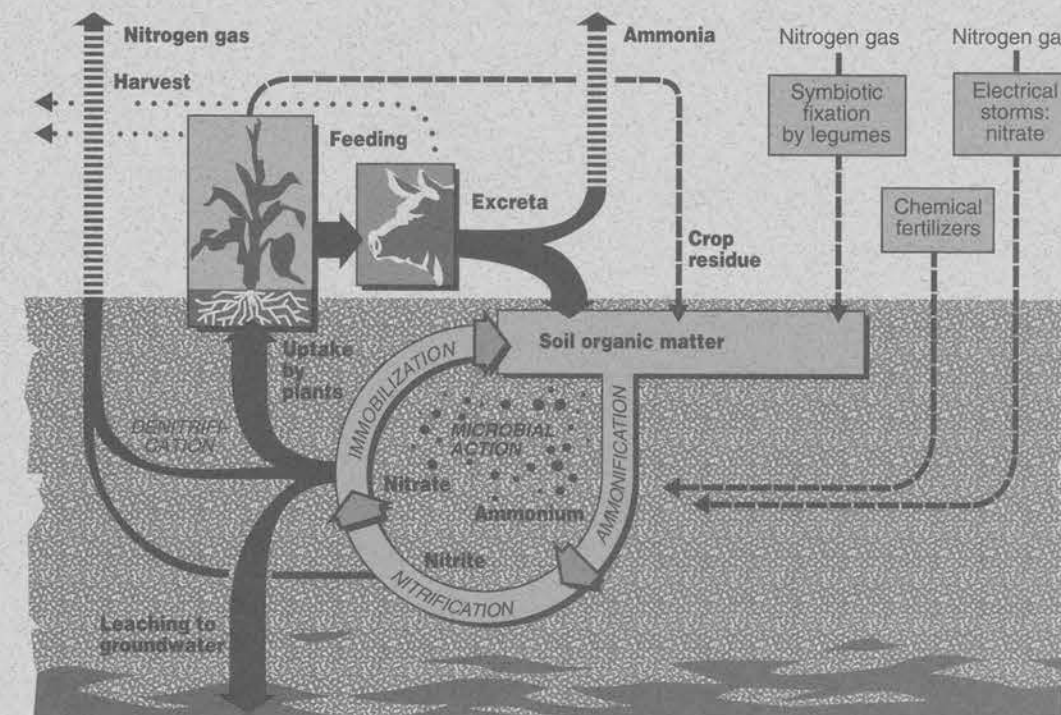
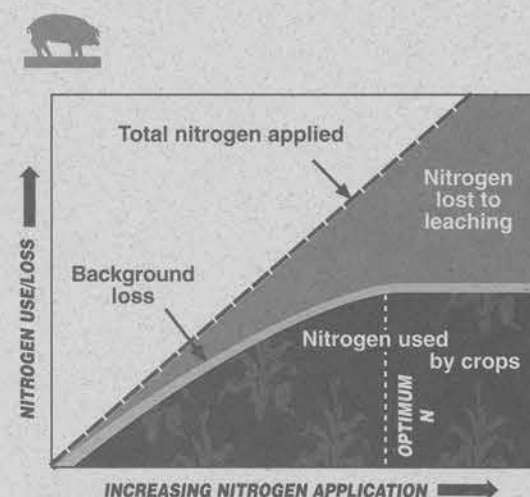


Figure 2. The nitrogen cycle

amount of nitrogen in the manure and the chemical form of the nitrogen. Manure management practices alter these factors and therefore have considerable impact on how manure affects the environment.

It is important to remember that nitrogen in manure is easily lost to the atmosphere, leached into the groundwater, or transported via runoff to surface waters. Any loss of nitrogen leaves less nitrogen

Figure 3. Impact of N rate on crop yield and nitrate loss



available for crop utilization. Nitrogen that is lost to the environment also has the potential to degrade water quality — a process detrimental to both human health and the natural ecosystem.

Phosphorus

Phosphorus, another nutrient found in manure, is essential for plant life. Phosphorus (P) is also considered a potential pollutant. How does phosphorus become an environmental hazard? The predominant form of phosphorus attaches itself to soil particles. These soil particles can then be transported via erosion to lakes and streams. Because phosphorus is a limiting nutrient in most of Minnesota's surface waters, any additions of phosphorus become a problem. Additions of phosphorus to a lake or stream dramatically increase the amount of aquatic plant growth. When these plants die they are consumed by aerobic bacteria (decomposed). This increased aerobic microbial activity can deplete the available oxygen supply of the affected lake or stream. If oxygen levels fall below a critical level, fish and other aquatic species die. Walleye, trout, bass, and other "sport fish" are especially vulnerable to low oxygen concentrations.

Raw Manure

Additions of raw manure to a lake or stream will significantly degrade water quality. Manure additions are typically the result of direct pumping, pumping into open tile inlets, or uncontrolled surface runoff from open lots or fields. Raw manure additions increase the nitrogen, phosphorus, and organic matter content of the lake or stream. Increased nitrogen and phosphorus concentrations contribute to excessive aquatic plant growth and the subsequent gradual depletion of the water's oxygen supply. Also, the rapid decomposition of the manure organic matter by aerobic bacteria will cause nearly an immediate depletion of the water's oxygen supply. If oxygen concentrations fall below a critical level, fish and other aquatic species die.

Health Risks

Although the primary hazards of mismanaged manure are nutrient related, there is also the potential for manure to contain parasites and disease-producing organisms. These organisms cause diarrheal diseases, infectious hepatitis, salmonella, and typhoid fever in human and domestic animals. Typically, these organisms and parasites can not survive outside of the animal; however, under certain environmental conditions these organisms do survive and transmit diseases to humans and animals.

Other health hazards are present when liquid animal manure is stored in large quantities. Decomposing manure in liquid storage structures creates potential health hazards. Toxic gases are produced during anaerobic (without oxygen) decomposition of manure. These gases include ammonia, carbon dioxide, methane, and hydrogen sulfide. Table 1 lists information on these gases and their effect on human and animal health. To reduce the risk of exposure to these gases (1) never enter a manure storage structure for any reason; (2) provide maximum ventilation and stay out of the build-

Table 1. Hazardous gas

Gas	Ammonia NH ₃	Carbon Dioxide CO ₂	Methane CH ₄	Hydrogen Sulfide H ₂ S
Allowable concentration	10 ppm	5000 ppm	—	5 ppm
Odor	Sharp, pungent	Odorless	Odorless	Rotten egg
Density	Lighter than air	Heavier than air	Lighter than air	Heavier than air
Human health concerns	Irritates eyes and respiratory tract. Can be asphyxiating at high concentrations.	Drowsiness and headaches. Can be asphyxiating.	Headaches. Can be asphyxiating. Explosive.	Extremely toxic. Causes headaches, dizziness, nausea, unconsciousness, and death

(Dangers in the Air When Handling Livestock, Minnesota Extension Service, FO-0778)

ing when agitating and pumping manure from a deep pit system; (3) leave at least one foot of air space between the manure level and the bottom of the slotted floor in a deep pit system.

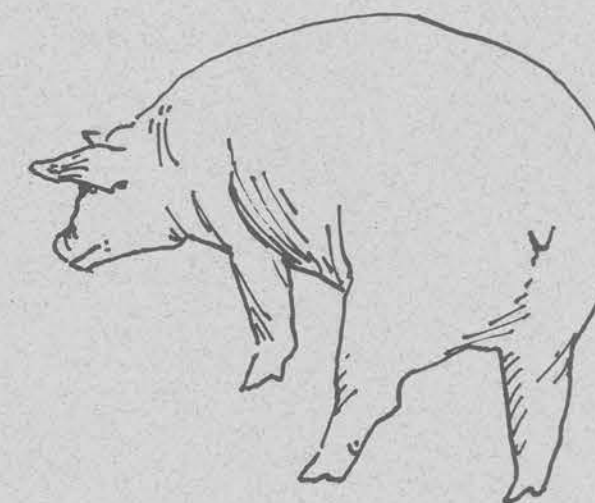
Another obvious hazard of storing liquid manure is the danger of falling into a storage area and drowning. A fence surrounding the storage structure is a simple way to reduce this hazard.

Odor

Currently there are no regulations regarding odor production or management. However, significant odors are generated during the anaerobic decomposition of manure, and these odors can cause problems. Although no health risk or long term environmental damage has been associated with odor, odor issues often create tension between producers and neighbors or communities. Conflicts are difficult to predict or resolve because odor offensiveness is a subjective issue. Not everyone is offended by the same odor or strength of odor — it depends on who is doing the smelling.

Because odors are produced during the anaerobic decomposition of manure, the surest way to decrease odors is to provide

oxygen to the manure (aeration). However, aeration is typically an impractical, high cost solution to odor problems due to the high energy requirements. Handling manure as a solid also reduces odor problems. It is possible to reduce odors from liquid manure by covering manure storage tanks, removing manure from the barns as quickly as possible, providing windbreaks, and incorporating or injecting manure. These management practices are discussed more fully in the following chapter.





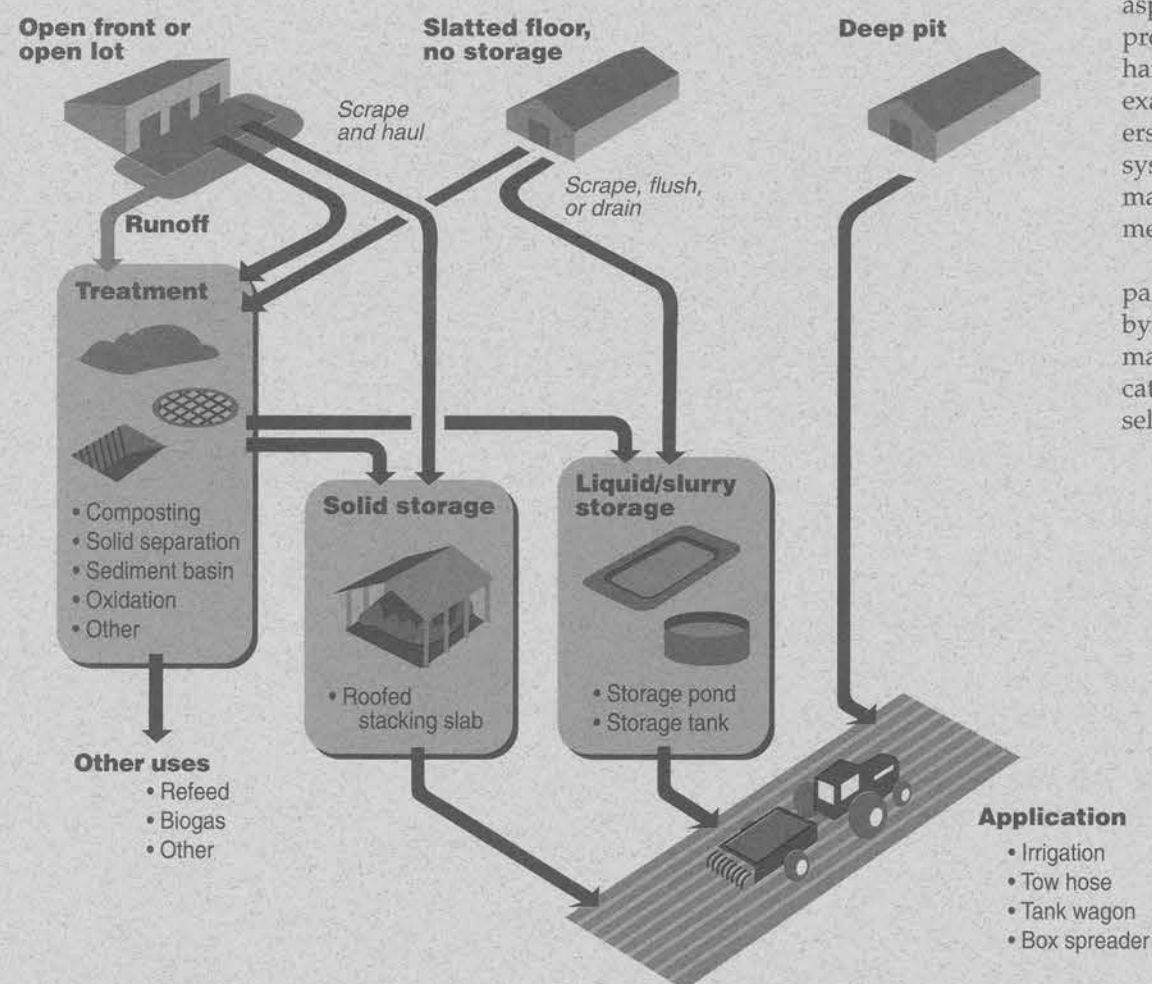
Manure Management for Environmental Protection

Manure can be a tremendous benefit as a soil amendment and as a source of plant nutrients. Manure may also be a significant polluter of Minnesota's air and water. Proper manure management is essential for gaining maximum benefits from manure and reducing liability or pollution potential.

In order to manage manure properly, all aspects of manure production and handling must be examined. Producers must take a systems approach to manure management (Figure 4).

The following pages are organized by six manure management categories: farm site selection; manure

Figure 4. Manure management system



production, collection, storage, treatment, and utilization. Discussion for each category includes current management practices as discovered by the project survey, a review of potential concerns related to the particular category, specific information regarding environmental management practices, and some ideas regarding future developments.

Site Selection and Public Relations

Survey results indicate relatively few Minnesota pork producers have had conflicts with neighbors or communities. However, with the current trend toward larger production sites and increased rural populations, it is clear that the frequency of producer/public conflicts will increase. Site selection and public relations are critical factors in determining the success of a swine operation — large, small, new, or old. All farm operations are part of a larger community; therefore, producers must consider the interests of that community when locating, expanding, or maintaining a farm facility.

An operation has a positive or a negative effect on a community depending on several factors. Any farm activity that draws public attention has the potential to generate problems. To avoid disputes between producers and neighbors or communities the following guidelines are useful.

Minimize production site visibility. A production site that is not easily seen draws less attention than those sites that are seen. Consider planting trees or constructing a soil berm between facilities and public roadways. Locate new facilities or expansions away from public view.

Keep in mind both the distance and direction to neighbors and communities. Swine operations will generate odors that can cause public relations problems. Odor strength is reduced as the separation distance from the odor source is increased.



Odor problems will be reduced by keeping manure as far away as possible from neighbors, communities, and public roads. Consider facility separation distances of one-half mile from neighbors and one mile from communities or recreation areas.

Locate facilities to accommodate land application of manure. Manure produced by livestock is typically applied to cropland. Regulations now require land application of manure to be done at agronomic rates. To reduce manure hauling distances it may be useful to expand facilities or manure storage systems on "remote" sites near where manure will be land applied.

Keep facilities well maintained. In the minds of many, an operation that looks bad, smells bad. Keeping the grass mowed and equipment stored will improve the image of the entire operation. Good maintenance also aids in the control of rodents and insects.

Keep the public educated and informed about any plans of expansion. If people know a producer is concerned about the environment, they may be more tolerant if temporary problems arise. Pork production is a business dependent on land and water resources. The public must know this. Hosting hog roasts or attending public



meetings will keep the public informed and educated on issues regarding pork production.

Know and comply with applicable local, state, and federal environmental regulations and zoning laws. Nearly all feedlots are required to have a state permit or certificate of compliance; many counties and townships also require permits. It is not always easy to understand and comply with the ever-changing rules and regulations. However, a legal defense based on regulatory compliance is stronger than one that is based on regulatory ignorance.

Evaluate current or proposed farm sites for potential environmental hazards. Evaluating the pollution characteristics of a particular site must be the first step toward reducing pollution potential. Not all farms have the same potential to cause environmental damage. Factors to consider when assessing risk include location of water wells, neighbors homes, and surface waters with respect to manure sources. Manure sources include manure storage areas and open lots. Site evaluation must also consider depth to bedrock, depth to high water table, general topography, and driveway and roof runoff. Producers who recognize the potential hazards on their farm are more likely to reduce their pollution risk by making the necessary modifications.

Take some kind of action on all complaints. Neighbors are also customers and keeping customers happy is part of any successful business. Producers must respond in some way to every complaint or criticism.

Future decisions in pork production will be based on how a production site impacts communities and air and water quality. There are many considerations to include in choosing new site locations, expanding current sites, or operating existing sites. To stay in business, a producer must be a concerned neighbor, a public relations specialist, and an environmentalist. Producers must also keep informed of and in compliance with current and future regulations by relying on help from a variety of sources including: the Minnesota Pork Producers Association, trade magazines, environmental consultants, Minnesota Extension Service, and state and federal agencies.

Manure Production

Producers typically consider manure production issues when their waste storage area is full or when they encounter some other manure-related problem. Producers would be wise to consider manure production as an integral part of manure management. Manure produced by the pig, consisting of feces and urine, makes up a large portion of any farm's waste stream (Table 2). The remainder of the waste stream is made up of cleaning water, water from leaky waterers, spilled feed, bedding, etc. Decreasing the waste stream does not necessarily imply a reduction in animal numbers but rather a reduction in the volume or nutrient content of the waste stream. Reductions in the waste stream mean less material to collect, store, transport, and apply to land. This reduction saves both time and money.

The easiest way to minimize the waste stream is to reduce the amount of "extras"

entering the storage or to reduce the volume and nutrient content of the feces and urine. The following management practices may help reduce the waste stream.

Control water wastage. Wasted clean water can contribute significantly to the volume of the waste stream. Main contributors to water wastage are excess cleaning water and leaky or improperly adjusted waterers. Methods to reduce the volume of the waste stream include conversion to wet feeders, repair of leaky waterers, maintenance of proper flow rate for nipple waterers, use of properly designed waterers, and use of high pressure-low flow washers (Table 3) for cleaning pens.

Control feed wastage. Studies indicate pig feeders commonly waste between 2% and 13% (and as high as 25%) of the feed put into them. Because of the high nutrient content of feed, any feed entering the waste stream significantly increases the waste stream's nutrient content. Therefore, reducing feed spillage decreases the nutrient content of the waste stream and improves production profitability. Studies have shown that feeder design alone can account for much of the wasted feed. Lack of frequent feeder adjustment is the other factor contributing to feed wastage.

Table 3. Water use for cleaning as affected by water pressure and flow rate

Pressure:	1750 psi	880 psi	880 psi
Flow rate:	4.2 gpm	4.2 gpm	12 gpm
	gal/ft ²	gal/ft ²	gal/ft ²
Pen type:			
Farrowing	1.9	1.9	1.7
Nursery	0.8	1.8	1.8
Finishing	1.0	1.2	2.0

(Roelofs and Hoofs, 1992, Research Institute for Pig Husbandry, Rosmalen, Netherlands)



Table 2. Daily swine manure production

Animal	Size lbs	Manure Produced: lb/day	gal/day	N lbs	P ₂ O ₅ lbs	K ₂ O lbs
Nursery	35	2.3	0.3	0.02	0.012	0.012
Growing	65	4.2	0.5	0.03	0.022	0.022
Finishing	150	9.8	1.2	0.07	0.050	0.054
	200	13.1	1.6	0.09	0.067	0.072
Gestating sow	275	9.0	1.1	0.07	0.050	0.050
Sow and litter	375	22.5	2.7	0.10	0.055	0.055
Boar	350	11.5	1.4	0.09	0.064	0.064

(Livestock Waste Facilities Handbook, Midwest Plan Service, March 1993.)

Improve efficiency of feed utilization.

Formulating diets to more accurately meet specific nutritional needs of pigs reduces the amount of undigested and excess nutrients entering the waste stream. This is possible by matching the type of genetics with the appropriate nutrient requirements, stages of growth (phase feeding), and feeding barrows and gilts different diets. Using these approaches to fine tune grow-finish feeding programs will not only reduce the amount of nutrients entering the waste stream, but will also reduce feed costs, making pork production more profitable.

Other nutritional considerations related to manure production. Some feed additives offer the opportunity to improve nutrient utilization in feed, thereby reducing nutrient levels in manure. Phytase is an example of an enzyme that allows the pig to digest and utilize more of the phosphorus present in cereal grains. This enzyme is currently being fed to pigs in some European countries to reduce the phosphorus content of swine manure.

Crude protein content of rations will impact manure nitrogen concentration. Reducing crude protein levels and supplementing with specific synthetic amino acids (e.g. lysine, tryptophan, threonine) to balance the



Table 4. Effect of reducing dietary protein and supplementing with amino acids on N excretion by 200-lb finishing pigs *

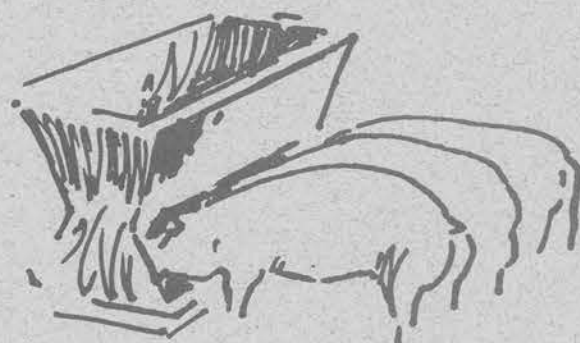
N balance	14% protein + lysine	12% protein + threonine	10% protein + tryptophan
N intake (g/day)	67	58	50
N retained (g/day)	26	26	26
N excreted in feces (g/day)	7	7	7
N excreted in urine (g/day)	34	25	17
Reduction in N excreted (%)	—	22	41

*Assumes an intake of 6.7 lbs/day, a growth rate of 2 lbs/day, a carcass lean tissue gain of 0.9 lbs/day, a carcass protein gain of 0.2 lbs/day, and that carcass N retention represents 66% of the total N retention.

(Cromwell, 1993. NPPC Environmental Symposium, Minneapolis, MN)

ration can reduce nitrogen content in manure by 22 to 41% (Table 4).

Extra material entering the manure stream must be minimized. Extra volume, in the form of water, demands increased storage capacity and increased transportation costs per pound of nutrients. Extra nutrient additions result in more land needed for maintaining proper application rates. Future reductions in manure production will be based on feeder and waterer designs and ration formulation. These new technologies will be based on maximizing pig performance while minimizing the waste stream. Producers must begin to use feed consultants and equipment manufacturers in solving their nutrient management problems.



Manure Collection

Survey results from this project indicate many Minnesota pork producers are handling some of their manure as a solid and some as a liquid. Both types of collection systems can be managed to protect air and water quality.

A manure collection system handles manure from the pig to the final storage area. Manure begins to decompose immediately after excretion by the pig. Anaerobic decomposition of manure produces odors and hazardous gases. These emissions create poor indoor air quality. Frequent and effective manure removal will reduce indoor odors and gas emissions, thus providing a cleaner, healthier, environment for workers and animals. Several different types of manure collection systems are available. Certain aspects of each system can be managed to achieve adequate manure removal.

Slotted flooring may accumulate manure. Any long term buildup of manure on floors, in alleys, or in corners will increase odor and gas production. To minimize odor and gas production, it is necessary to keep floors clean and dry. Slotted floor systems should have a space between the wall and the floor — approximately three inches — to prevent manure from collecting in the corners and along the walls.

Solid flooring/scrape and haul systems should be cleaned at least every three to five days. Scraping must remove as much manure as possible to avoid any long term buildup.

Bedding or deep litter systems, when properly managed, result in few odor problems and reduced manure handling. Proper management includes some stirring or mixing to insure manure decomposes aerobically. Without proper management these systems may result in increased production of ammonia and nitrous oxide.

Pasture systems eliminate manure collection and handling during the time the pigs are on pasture. Low density pasture systems are relatively odor free. Proper care is important in choosing the location of the pasture system to avoid runoff potential.

Flushing of alleys or gutters (flush systems) should be done at least four times per day. Frequent flushing prevents solids buildup. Flushing frequency also depends on system design. Clean water or recycled water with low nitrogen concentration must be used for flushing.

Gravity drain systems should be drained at least once every two weeks; weekly is preferred. If possible, gutters should be refilled with 1 to 4 inches of clean water or water low in nitrogen. Frequency of draining also depends on the design of the system.

Deep pit systems collect and store manure directly under the animals. Air quality may be a problem if a continuously running "pit" fan is not provided, especially when the pit is nearly full.

Mechanical scrapers must be run once every three to five days and should remove as much manure as possible. Daily scraping is not recommended because the stirring action of the scraper generates gas emissions. These emissions cause high ammonia concentrations inside the barn.

Divert rain water from any open lots. Runoff from open lots contains manure and therefore high concentrations of nutrients. Collecting or treating runoff may often be more difficult and expensive than putting a roof over the open lot.

Table 5 attempts to rate the environmental risks associated with different types of collection systems. Keep in mind that environmental risks are very site specific and heavily influenced by management practices.



Table 5. Relative environmental risk — collection systems

Evaluations are based on environmental issues only. Relative environmental risk is both site specific and dependent on management practices and proper system design. (Explanation: ● = low; ●●●●● = high)

	Risk to water quality	Risk to air quality
SOLID SYSTEMS		
Pasture		
• low stocking density — no water access	●	●
• medium stocking density — slope to water	●●●	●●●
• high stocking density — water access	●●●●●	●●●●●
Open lot		
• concrete with runoff control	●	●●●
• clay with runoff control	●●●	●●●
• clay without runoff control	●●●●●	●●●
Scrape and haul		
• 1 or 2 times per week	n/a	●
• less than weekly	n/a	●●●
• less than monthly	n/a	●●●●●
LIQUID SYSTEMS		
Flush		
• 2 to 3 times daily with clean water	n/a	●
• 2 to 3 times daily with recycled water	n/a	●●●
• 1 time per day or less with recycled water	n/a	●●●●●
Gravity drain		
• drain weekly, with recharge	n/a	●
• drain weekly, no recharge	n/a	●●●
• drain less than weekly, no recharge	n/a	●●●●●
Mechanical scraper		
• scrape daily*	n/a	●●●●●
• scrape 3 to 5 days	n/a	●●●
• scrape less than weekly	n/a	●●●●●
Deep pit	●	●●

For water quality, environmental risk is based on the risk of manure entering surface water or groundwater. For air quality, environmental risk is based on manure exposure to air.

*The stirring action of mechanical scrapers tends to generate odors and gases. Allowing manure to collect for more than 5 days will provide anaerobic conditions causing increased generation of odors and gases.

Future manure collection systems must be designed to reduce odors and gas emissions. System design and management will be based on removing manure from the barn frequently and effectively. Currently, there are trade-offs in the management of collection systems. A balance is necessary between minimizing air quality impacts and



maximizing profits, and each producer must work out this balance according to his or her specific needs and priorities.

Manure Storage

Manure storage systems contain manure from the time it is generated to the time it is utilized. Survey results indicate the most common liquid storage system for Minnesota pork producers is a deep pit—manure storage directly under the animal facility. Other storage systems include above- or below-ground concrete tanks, above-ground steel tanks, earthen storage basins, and solid manure stockpiles. Certain aspects of each system must be managed to reduce the risk of negative environmental impact. Manure storage overflows or leaks are the primary environmental hazards associated with storage systems. Manure storage systems must safely contain manure nutrients until they can be utilized. Manure storage systems can also play a role in reducing ammonia volatilization and odor emissions. The following management guidelines serve to conserve nitrogen, reduce odors, or reduce the risk of negatively impacting water quality.

Provide adequate storage capacity. The storage capacity of any storage system should be a minimum of six months with nine- to twelve-month capacity more



Table 6. Nitrogen losses during manure storage

System	N loss (%)
Solid manure storage	
Daily scrape and haul	15-35
Manure pack	20-40
Open lot	40-60
Liquid systems:	
Deep pit (with ventilation)	15-30
Above ground storage	10-30
Earthen storage	20-40
Lagoon	70-80
Covered storage*	4-10

(Adapted from Livestock Waste Facilities Handbook, Midwest Plan Service, March 1993.)
* M.J.C. Debode, 1991, Odour and ammonia emissions from manure storage. In Odour and Ammonia Emissions from Livestock Farming.

desirable. Smaller storage capacities demand more frequent manure hauling. Hauling manure more frequently may not always be possible due to inclement weather or time constraints, e.g., planting or harvesting. With larger storage capacities producers are able to apply manure according to crop needs, rather than having storage capacity dictate when to haul manure.

Keep rain water out of storage area. Rain water runoff from open lots and building roofs must be diverted from any storage area. Any "clean" runoff that is not diverted adds to the risk of storage overflow and increases the volume of manure to be transported to the field.

Cover storage systems whenever possible. Covering the storage system reduces the release of odors and gases. A physical covering or a floating crust may be used. A physical covering also serves to eliminate dilution of manure by rain water.

Manage deep pit systems to minimize ammonia and other gas concentrations inside the barn. Proper management of a deep pit system to reduce hazardous gases in the barn includes continuous pit ventilation and keeping the slurry level at least one foot below the bottom of the slats or open flooring.

Insure the quality of all storage systems. Earthen storage structures should be properly constructed. Current state regulations require that a registered professional engineer or the Soil Conservation Service design all earthen storage structures. Concrete agitation pads are required on new structures and recommended for older structures. Because linings can be damaged through agitation, it is a good idea to inspect earthen storage structures every five years to insure lining (clay or synthetic) remains intact. Without a proper lining there is a high risk of nitrates leaking into the ground water.

Concrete and steel storage structures must be inspected for cracks or leaks. Steel storage structures, i.e., old gasoline storage tanks, are not allowed to be placed underground.

Stockpile manure on a concrete or clay pad. Runoff should be contained by low sidewalls or gutters. This runoff must be collected, stored, and land applied or treated. In some situations collecting or treating runoff may be more difficult and expensive than covering the stockpile.

Locate storage systems to avoid potential problems. Keep in mind prevailing winds, distances to public or residential areas, and water sources when considering where to locate a storage unit. Odors travel with the wind and are generally diluted farther from the storage area. A minimum separation distance of one quarter mile should be observed. Natural air flow patterns also affect odor transport. During calm summer



evenings air near the ground begins to cool and drifts down-slope, since cool air is heavier than warm air. This cool air will pick up odors and transport them down-slope. As a result, it is best to choose a site that is lower than nearby public or residential areas.

Locate storage systems where manure nutrients are needed. Manure storage areas do not necessarily need to be built next to the barn. Liquid manure can easily be pumped to a remote storage site. This

Table 7. Relative environmental risk — storage systems

Evaluations are based on environmental issues only. Relative environmental risk is both site specific and dependent on management practices and proper system design. (Explanation: ● = low; ●●●●● = high)

	Risk to water quality ¹	Risk to air quality ²
SOLID STORAGE		
Stacking slab		
• concrete pad, roof, runoff control	●	●
• earthen pad, no roof, runoff control	●●●	●●●
• earthen pad, no roof, no runoff control	●●●●●	●●●
LIQUID STORAGE		
Above ground tank (concrete or steel)		
• covered, no leaks	●	●
• not covered, no leaks	●	●●●
• not covered, leaks	●●●●●	●●●
Below ground tank (concrete)		
• covered, no leaks	●	●
• not covered, no leaks	●	●●●
• not covered, leaks	●●●●●	●●●
Deep pit (concrete bottom)		
• Earthen	●	●●●
• clay or synthetic liner, clay soils	●	●●●●
• clay or synthetic liner, sandy soils	●●●	●●●●
• no liner, clay soils	●●●	●●●●
• no liner, sandy soils	●●●●●	●●●●
• located in karst area (with or without liner)	●●●●●	●●●●

¹ For water quality, risk is based on stored manure's potential contact with soil or surface waters. All storage capacities are assumed to be at least six months. The storage location is assumed to be at least 300 feet from well or surface water and six feet above the water table.

² For air quality, environmental risk is based primarily on the ratio of surface area to volume — larger surface areas are at higher risk for producing odors and gases.

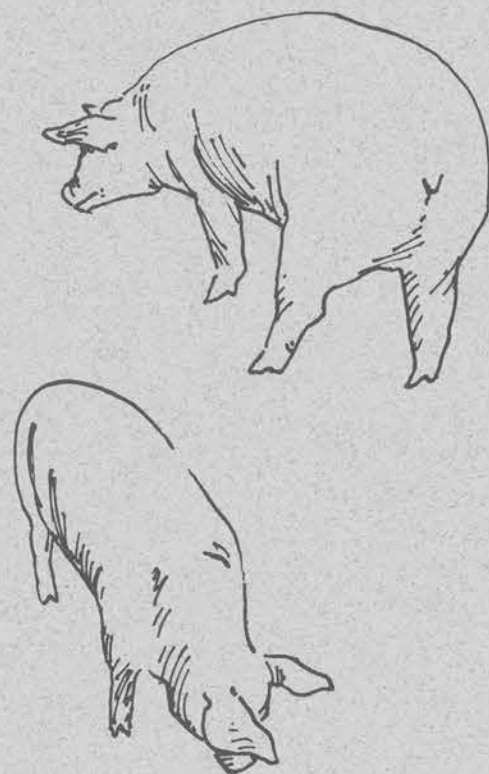


remote storage allows manure to be distributed on land farther from the main production site without much additional cost.

Prepare for accidents or overflows. Water quality can be affected by any type of manure storage unit when considerations are not made for accidents or overflows. To avoid potential water contamination, locate manure storage structures at least 1,000 feet from any lake or 300 feet from any other water source. (Local zoning ordinances may require longer setback distances.) The ultimate goal in locating a storage unit is to have one that is neither seen nor smelled by the public and one that does not threaten water quality.

Nitrogen loss and gas and odor production can be expected with any manure storage system. Some examples of nitrogen loss through volatilization from various manure storage systems are listed in Table 6. Through the proper management and design of manure storage systems, these problems can be significantly reduced. Table 7 attempts to rate the environmental risks associated with different types of manure storage systems. Keep in mind that environmental risks are very site specific and heavily influenced by management practices.

Future designs of manure storage systems will place a priority on reducing odor and gas production. These designs may include the use of covers, chemical or biological additives, manure treatment prior to storage, and other technologies.



Manure Treatment

Manure treatment systems may be incorporated into any manure management system. Currently, very few Minnesota pork producers use manure treatment systems. Treatment systems include settling basins, mechanical separators, anaerobic digesters, oxidation ditches, lagoons (*not earthen storage basins*), composting, etc. The role of any treatment system is to reduce, stabilize, concentrate, or separate nutrients or organic matter in the waste stream.

Reducing the nutrient load in the manure stream typically reduces the land base necessary for applying manure. Reducing total nutrients may be a priority for producers with limited land available for manure application. Separation of manure nutrients or organic matter allows producers more flexibility in manure utilization or improves subsequent treatment system efficiency, or both. Because of the added costs involved, treatment systems are typically used in cases where there is a particular manure management problem, e.g., restricted land base for manure application, long transportation distances to fields, or a demand for treated water for reuse in a flush system.

Liquid-solid separation systems such as settling basins and mechanical separators provide a means of separating nutrients from the waste stream. Separated solids contain most of the organic nitrogen and phosphorus. This separation of nutrients reduces transporting costs of the solid fraction per pound of nutrients because the moisture content is reduced. Solids removal reduces odor and gas production during storage of the liquid fraction. Liquid-solid separation is often used in conjunction with a lagoon system. Removing solids increases the treatment efficiency of lagoons.

Composting reduces and stabilizes the manure organic matter. Composting will also kill pathogens and weed seeds and may

reduce the nitrogen content of the manure — depending on the carbon/nitrogen ratio of the manure. Proper composting of manure produces a uniform, dry, and odorless soil conditioner. Composting is a viable option for solid manure systems or for the solid portion of liquid-solid separated manure from a liquid system. Typically, composting is an aerobic process and therefore requires energy inputs in the form of aeration or mixing equipment. Composting assists the producer who has a restricted land base for manure application.

Anaerobic lagoons stabilize and reduce organic matter and reduce nitrogen concentration. Anaerobic lagoons provide an inexpensive treatment method but are not always effective in Minnesota because of the cold temperatures. Proper sizing of lagoons is critical to get proper manure treatment.

Anaerobic digesters stabilize manure organic matter. The process converts the biodegradable portion of manure to methane gas and carbon dioxide. The process concentrates the nitrogen, phosphorus, and potassium from the manure and produces biogas. This biogas can be burned to produce heat or electricity. Anaerobic digestion is also effective for reducing odors and converting the organic nitrogen to ammonia





nitrogen. Because of high management requirements, anaerobic digesters are not suitable for many situations. However, anaerobic digesters may become a more viable option if energy prices continue to increase.

Oxidation ditches and aerated lagoons stabilize and reduce the organic matter in the waste material. Treatment systems that use aeration are also effective at eliminating odor problems. Aeration systems are relatively uncommon and typically uneconomical due to their high energy demands.

Filter strips, grassed waterways, and constructed wetlands are a cost effective means of reducing nutrient concentrations in runoff water. These systems cannot be used to treat manure directly from manure storage units. Filter strips, grassed waterways, and constructed wetlands are only effective in treating very dilute wastes. In order for these systems to remove nutrients effectively they must be properly designed and managed.

Treatment systems are not typically cost effective in most situations. However, future regulations regarding land application may encourage the use of manure treatment systems. For example, treatment systems that concentrate nutrients (remove water) will become cost effective when nutrients have to be transported farther — due to limitations of nitrogen or phosphorus applications on cropland.



Manure Utilization

The final destination of most swine manure is cropland. How, when, and where this manure is applied can significantly impact the environment. Survey responses indicate surface broadcasting is the primary means of manure application. Current land application techniques for surface broadcast include box spreaders, tank wagons, tow hoses, and irrigation systems. Land application techniques for subsurface injection include knife, sweep, and disc injectors on a tank wagon or tow hose system. Although there are many physical differences in application systems, the principles regarding nutrient loss and nutrient utilization remain the same. Limiting manure exposure to the atmosphere reduces nitrogen losses and decreases odors. Runoff potential increases if manure is surface broadcast versus injected. Any nitrogen and phosphorus application rates in excess of crop needs increase the risk of nutrients being transported to ground or surface waters. Table 8 attempts to rate the environmental risks associated with different types of application systems. Keep in mind, environmental risks are very site specific and heavily influenced by management practices.

Manure application systems must be designed and managed to insure manure nutrients are fully utilized for crop production. The following points are important:

Develop a manure management plan. A manure management plan insures the maximum use of manure nutrients for crop production. Many factors are involved in determining a manure management plan. Field selection and application rate play key roles in developing a manure management plan. Other factors involved in determining a manure management plan include knowing the nutrient content of the manure as it is being applied, estimating nutrient loss during application, matching soil tests with crop requirements, knowing the crop rotation, and setting realistic yield goals. The Minnesota Extension Service, other state

agencies, and private consultants may be of assistance in developing a manure application plan.

Agitate the storage unit before and during application. Settled solids in the bottom of the storage unit contain most of the phosphorus and organic nitrogen. In order to get a uniform distribution of these nutrients the storage should be agitated thoroughly before beginning the application process. Mechanical agitation is much more effective than agitation with a siphon vacuum tank. Complete mixing of a storage structure may require from 2 to 4 hours of agitation, depending on agitation equipment and size of storage unit. Because of the rapid settling characteristics of pig manure it is best to continue agitation throughout the pumping and application process.

Keep adequate records. Records of manure applications, crop yields, fertilizer applications, and soil test results should be maintained for all fields. This information is used to monitor and adjust nutrient management more precisely, thereby maximizing profits and protecting the environment.

Calibrate application equipment. Application equipment must be calibrated to insure proper application rates. Application equipment must also distribute manure uniformly on the crops. Uniform application and proper calibration insure all plants are receiving maximum benefits from the manure application.

Time manure application to fit the needs of your crop. Timing of manure applications to minimize environmental pollution depends on several factors. Factors to consider include cropping practice, compaction, temperature, precipitation, soil texture, and topography. Applications that have the maximum potential for environmental damage include fall applications on coarse textured soil and applications on sloped, frozen soils.



Avoid spreading manure near surface waters or waterways. The most common source of water degradation from manure application is from runoff. To reduce this risk, do not spread manure near lakes, streams, drainage ditches, open tile intakes, wetlands, grassed waterways, sloping fields, gullies running to surface waters, sinkholes, and shallow water table areas. Manure application near any of these can easily lead

Table 8. Relative environmental risk — application systems

Evaluations are based on environmental issues only. Relative environmental risk is both site specific and dependent on management practices and proper system design. (Explanation: ● = low; ●●●●● = high)

	Risk to water quality	Risk to air quality
Application rate		
• based on crop nutrient requirements	●	
• based on crop removal	●●●	
• no regard for cropping system	●●●●●	
Method of application		
• sweep or disk injection (liquid)	●	●
• surface broadcast (liquid)		
— incorporation (within 12 hours)	●●●	●●●●
— no incorporation	●●●●●	●●●●●
• surface broadcast (solid)		
— incorporation (within 24 hours)	●●●	●●●
— no incorporation	●●●●●	●●●
Timing of application		
• spring	●	●●
• fall or winter flatland	●●●	●
• winter — sloped fields	●●●●●	●
• summer- side dress / top dress	●	●●●●●
Manure analysis		
• "on the go"	●	n/a
• from laboratory	●●	n/a
• tabled values	●●●	n/a
• no analysis	●●●●●	n/a
Equipment calibration		
• "on the go" with flow control	●	n/a
• calculations based on volume or weight	●●●	n/a
• no calibration	●●●●●	n/a

For water quality, environmental risk is based primarily on the potential for over-application. For air quality, environmental risk is based primarily on manure's exposure to air and average climatic conditions.



Table 9. Separation distances for spreading manure

	Separation distance (feet)		
	Injection or immediate (within 1 hour) incorporation	Surface spreading with delayed (over 12 hours) incorporation	Irrigation without incorporation
Odor concerns			
Individual dwelling	50	100	300
Residential development	200	300	1000
Public roadway	25	25	300
Water quality concerns			
Streams or rivers	50	200	200
Lakes	100	200	300
Wetlands	50	200	200
Ditches and open tile inlets	25	100	200
Water wells	200	200	200
Sinkholes	50	100	200

(Adapted from Minnesota Pollution Control Agency's "Running Your Feedlot.")

to water quality damage. Recommended separation distances are listed in Table 9.

Incorporate or inject manure into the soil. Injecting manure or incorporating manure immediately after broadcast application significantly decreases nitrogen loss and minimizes odor production. Up to 50% of

the nitrogen in manure can be lost from broadcast applications with no incorporation. Reducing nitrogen loss increases the amount of nitrogen available for crop utilization (Table 10). Injection or broadcast with incorporation also reduces runoff potential for both phosphorus and nitrogen.

Consider neighbors when applying manure. Good public relations are a priority for any business enterprise. Conflicts can be avoided by not spreading manure on weekends, holidays, or special occasions; not transporting manure on main roads; spreading manure at night; and by keeping in mind both wind direction and proximity to neighbors when spreading.

Survey responses indicate most producers do not take nutrient credits for manure applications to cropland. As a result, producers are over-applying nutrients to cropland. This over-application of nutrients is both an added expense to producers and a major contributor to water quality degradation. As producers realize the nutrient value of manure they will demand new equipment technologies and manure application plans to insure manure nutrients are used to their full potential. New technologies will provide equipment

Table 10. Nitrogen availability and loss per application method*

	N availability (%)		N loss (%)
	Year 1	Years 2-3	Total
Broadcast			
no incorporation	30	30	40
incorporation within 12 hours	65	25	10
incorporation within 4 days	45	30	25
Injection			
Sweep	65	30	5
Knife	50	35	15

Table shows average losses and availability of nitrogen under normal conditions. Soil organic matter, time of application, soil texture, rainfall, temperature are all factors affecting nitrogen availability and loss.

*Assumes the stored swine manure contains 65% inorganic N and 35% organic N. (Adapted from Minnesota Extension Service publication FO-5879.)



Dead Pig Disposal

Proper handling of dead pigs is an important element of any swine operation. Improper disposal of dead pigs results in water quality degradation, disease transmission, and odor problems. Currently, three types of disposal methods are allowed by the Minnesota Board of Animal Health: burial, incineration, and rendering. The following are management guidelines for any dead pig disposal system.

Adopt biosecurity to avoid disease transmission. Vehicles that have been recently exposed to other dead animals must not be allowed on the production site.

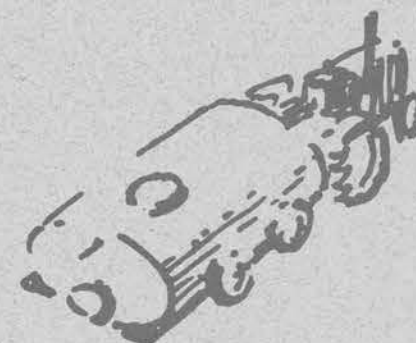
Dispose of animals within 24 hours by burial, rendering or incineration. Dead pigs that are not disposed of within 48 hours should be frozen or kept in a sealed container.

Burial in karst regions or where there is a high water table is not allowed. Dead animals must be covered by three feet of soil and be five feet above the high water table. Cover each day's deposits with a layer of soil. No other farm garbage should be placed in the burial site. Locate burial sites away from lakes, ponds, rivers, streams, wetlands, ditches, or wells.

Incineration must be done in an incinerator that meets Minnesota Pollution Control Agency criteria. The MPCA does not require a permit for an incinerator provided the incinerator is used for carcasses only. Afterburners that maintain flue gases at 1200° F for at least 0.3 seconds are required (MPCA rule no. 7011.1215). Incinerators should be located away from public view and should be operated at times when neighbors will be least affected. Some considerations in operating schedule should

with variable rate technology — similar to the commercial fertilizer applicators. This equipment will allow producers to apply manure at rates specified by crop needs and soil conditions. New equipment will also serve to reduce odors and ammonia volatilization through better and more versatile injection/incorporation techniques. With greater emphasis on applying manure at agronomic rates, producers will be required to distribute manure over more acreage. This will create the need for contracts between livestock producers and neighboring crop farmers. This practice will benefit both pork producers and crop producers. Greater manure hauling distances will also create the need for more efficient ways to transport and apply manure.

Manure has the potential to improve soil quality and crop performance. Manure applications also have the potential to decrease water or air quality. Understanding both the risks and benefits of manure application assists producers in making decisions that best fit the needs of the operation. A good manure management plan is environmentally sound, maximizes crop benefits, and minimizes commercial fertilizer inputs. Trade-offs exist between proper manure management and short term economics; however, with a little thought and planning, the long term trade-offs will be minimal.





include wind direction, time of day, weekends or holidays, special occasions, etc.

Locate rendering pickup sites away from lakes, ditches, and streams. Pickup sites must be hidden from public view by a screen or shelter. Rendering plants typically require records of drug residues in the dead animal.

Burial, incineration, and rendering are currently the only legally accepted methods of dead pig disposal. Attention to proper management of these systems minimizes the risk of water quality degradation, limits odor problems, and reduces the potential for disease transmission. Another method of disposal currently under review is composting. Composting of dead pigs can be done with a special permit from the Minnesota Board of Animal Health.



Summary

Manure management will always be a part of pork production. Manure management practices can have a significant impact on the environment, regardless of the size of the operation. Producers who consider the environment in their manure management decisions help to maintain a healthy environment, now and for generations to come. Key steps in reducing the risk of air or water quality damage from manure are:

- 1) Understanding how manure impacts air and water quality.
- 2) Keeping the public in mind when locating, expanding, or maintaining a facility.
- 3) Reducing the amount of material entering the waste stream.
- 4) Collecting and storing manure to preserve nutrients and minimize gas and odor emissions.
- 5) Applying manure to fields in a way that most fully utilizes the available nutrients.

Several environmentally sound manure management practices have been identified that can be modified to fit the needs and situations of Minnesota pork producers. By adapting environmental manure management practices, producers can continue to protect the environment without sacrificing farm profitability.

Several publications are available on all aspects of environmentally sound manure management. Many of these publications are listed in Appendix A. Information and technical and financial assistance is also available through several state and federal agencies (Appendix B).

Appendices

Appendix A. Publications

Pork Industry Handbook factsheets (PIH)

Legal Guidelines for Swine Waste Management	PIH-35
Controlling Odors from Swine Buildings	PIH-33
Swine Waste Management Alternatives	PIH-67
Scraper Systems for Removing Manure from Swine Facilities	PIH-105
Gravity Drain Gutter Systems	PIH-95
Flushing Systems for Swine Buildings	PIH-63
Systems of Runoff Control	PIH-21
Lagoon Management	PIH-62

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Minnesota Extension Service publications

Understanding Nitrogen in Soils	FO-3770
Fertilizing Cropland with Swine Manure	FO-5879
Self Assessment Worksheets for Manure Management Plans	FO-5883
Farm-A-Syst: Farmstead Assessment Systems	PC-5696
Manure Application Planner (Computer Program)	

*University of Minnesota
MES Distribution Center
Room #3 Coffey Hall
1420 Eckles Avenue
St. Paul, MN 55108-6064
(612) 625-8173*

Other publications

Livestock Waste Facilities Handbook (112 pages)
MWPS-18

*MidWest Plan Service
122 Davidson Hall
Iowa State University
Ames, IA 50011-3080
(515) 294-9589*

"A Livestock Producer's Guide to Nuisance, Land Use Control, and Environmental Law"
by Neil D. Hamilton (175 pages)

*American Farm Bureau Federation
Environmental Laws — Livestock
225 Touhy Avenue
Park Ridge, IL 60068
(312) 399-5844*





Appendix B. State and Federal Agencies

Several agencies have a role in farm waste management in Minnesota. The following is a brief outline of each agency and its current role in waste management.

Regulatory

Minnesota Pollution Control Agency (MPCA)

The MPCA is the primary environmental agency in Minnesota and is delegated by the United States Environmental Protection Agency to administer federal environmental programs. In addition to its federal responsibilities, the MPCA administers a number of state programs including the Feedlot Program. The Feedlot Program regulates animal feedlots so as to minimize their pollution impact on the waters of Minnesota. Many aspects of MPCA's Feedlot Program are administered locally by county feedlot officers. See Appendix C for a sample permit application.

• For more information contact the MPCA at (612) 296-6300.

Minnesota Board of Animal Health

The Minnesota Board of Animal Health, along with its other responsibilities, is the state agency designated to regulate the disposal of dead animals. Current regulations allow for rendering, incineration, and, under certain conditions, burial.

• For more information contact the Minnesota Board of Animal Health at (612) 296-2942.

Department of Natural Resources (DNR)

The DNR is the department of state government delegated to enforce criminal violations of Minnesota fish, game, recreational, and environmental statutes. DNR Conservation Officers are licensed peace

officers. The DNR, in conjunction with the MPCA and the Minnesota Board of Animal Health, investigates pollution complaints and insures any violations are dealt with according to current law.

• For more information contact the DNR Enforcement Division at 612-296-4771.

Cost Share Assistance

Agricultural Stabilization and Conservation Service (ASCS)

The ASCS (a USDA agency), in addition to other responsibilities, is responsible for administering the Agricultural Conservation Program (ACP). This federal program allocates money to feedlot owners for implementing pollution abatement practices. The yearly amount available is \$3,500 or 75% of the project cost, whichever is less. A long-term agreement can also be used that lasts for up to ten years and allows the owner to receive up to \$35,000 at one time or 75% of the cost, whichever is less.

• For more information contact your local ASCS office.

Board of Water and Soil Resources (BWSR) and Soil and Water Conservation Districts (SWCD)

The BWSR is responsible for allocating state cost-share moneys to the local SWCDs. The local SWCDs are responsible for administering the program and distributing the money to landowners. This program may offer up to 75% cost-sharing on a project.

• For more information contact the BWSR at (612) 296-3767 or your local SWCD office.

Agricultural Utilization Research Institute (AURI)

The AURI is a nonprofit corporation created by the state of Minnesota to strengthen its rural economy by developing new uses for Minnesota farm products.

Funding is available for producer groups and farm organizations to investigate value-added processing and production cost reductions through new technologies, technology transfer, and new farming practices — including environmental protection projects. Funds are also available to individual businesses to develop new or value-added agricultural based products.

• For more information contact AURI's Environmental and Engineering Services at (507) 835-8990 or 1-800-279-5010.

Technical Assistance

Soil Conservation Service (SCS)

The SCS, along with its other responsibilities, is the branch of the United States Department of Agriculture (USDA) responsible for providing technical assistance to farmers for implementing conservation practices — including pollution abatement systems. Feedlot owners with potential feedlot pollution problems are advised to contact the local SCS for technical assistance — even if the MPCA has never received a complaint or done an inspection. The SCS cannot provide assistance without a request from the feedlot owner.

• For more information contact your local SCS office.

Soil and Water Conservation District (SWCD)

The SWCDs work closely with landowners to offer technical services in field work and design of pollution abatement systems. The SWCD office is usually located in the same office as the SCS.

Private Consultants

Feedlot owners who do not qualify for technical assistance from the SCS or SWCD — their feedlot does not present a pollution hazard — have the option of contacting private consultants. Projects requiring

engineering design must be done by an engineer registered with the state of Minnesota.

Educational Opportunities

University of Minnesota Extension Service (MES)

The MES, along with its other responsibilities, provides educational opportunities to feedlot owners and operators in regard to manure management practices. Workshops, demonstration projects, field days, and individual consultations are offered on several aspects of manure management.

• For more information contact your local MES office.

Minnesota Department of Agriculture (MDA)

The MDA, along with its other responsibilities, is involved in the development and promotion of official statewide best management practices (BMPs) for agricultural chemicals, fertilizers, and other agricultural practices — including nutrient and manure management. The MDA also promotes sustainable agriculture and coordinates research on environmentally sound agricultural management practices. The MDA cooperates with other state and local organizations to provide information to farmers and the public through demonstration projects, seminars, and field days.

• For more information contact the MDA at (612) 296-2200

Appendix C. MPCA Permit Application (pp. 26-27)



State of Minnesota Permit Application for Construction and Operation of an Animal Feedlot

Return to: Minnesota Pollution Control Agency (MPCA)
Division of Water Quality/Regulatory Compliance Section
520 Lafayette Road North
St. Paul, MN 55155



Name of applicant: Phone:

Address:

City: State: Zip:

Farm owners' names, and addresses: (If different from above) Phone:

Location of Feedlot County:

Township name: Section number: Quarter Section:

Township number: T N Range: R W Quarter of quarter:

If there is an existing MPCA permit for this feedlot, please state the number

1. Reason for application: (Check as many as apply)

- ☐ A. New feedlot or animal facility, or facility not used in the last five years or more.
- ☐ B. Expansion of an existing feedlot or animal facility (increased animal numbers).
- ☐ C. Remodeling or modification of an existing feedlot or animal facility (no increase in animal numbers).
- ☐ D. Change in ownership of an existing feedlot or animal facility.
- ☐ E. Complaint or report of a pollution hazard.

2. Soils and Hydrology.

A. What is the soil type in the area of the feedlot?

B. Is there bedrock within 15 feet of the surface? (Check one) Yes No

If so, what is the approximate depth to bedrock?

C. Are there any rivers or streams within 300 feet of the feedlot? Yes No

D. Are there any lakes, ponds, or wetlands within 1000 feet of the feedlot? Yes No

If you answered yes to either C. or D. please list the names of these water bodies and their distance to the feedlot:

Names: Distance:

E. Is the feedlot in a designated floodplain or does the feedlot flood in the spring or after a heavy rain? Yes No

Revised 12/79
PQ-00234-03

F. What is the depth to the seasonal high water table? (Check one)

0 - 10 FT 11 - 20 FT 21 - 30 FT 31 - 40 FT 40 FT or more

This was determined by: (Check one) Soil Boring Well Log Estimate

G. Please list this information about working and abandoned wells within 1000 feet of the feedlot:

	Well #1	Well #2	Well #3	Well #4
Distance to feedlot				
Depth				
Household use	Yes No	Yes No	Yes No	Yes No
Livestock use	Yes No	Yes No	Yes No	Yes No
Irrigation use	Yes No	Yes No	Yes No	Yes No
Abandoned	Yes No	Yes No	Yes No	Yes No
If abandoned, was the well capped by a licensed well driller?	Yes No	Yes No	Yes No	Yes No

H. Are there any runoff control structures on outside livestock confinement lots? Yes No

3. Please list the maximum total number of animals on your farm at any one time by the most appropriate category:

Present Total	Animal Type	Total After Expansion (If Applicable)
	Calves (150-500 lb)	
	Feeder cattle (500-1200 lb)	
	Beef cows	
	Young dairy stock (500-1000 lb)	
	Replacement heifers	
	Dairy cows	
	Nursery pigs (up to 50 lb.)	
	Grower/feeder Pigs (50-100 lb)	
	Finishing hogs (100 lb-Market wt.)	
	Sows	
	Boars	
	Sheep	
	Turkeys	
	Layer chickens	
	Broiler chickens	
	Horses	
	Other (identify type)	

4. Manure Management

A. Number of acres available for spreading manure:

Acres owned Acres Rented Acres available from neighbors

B. Do you receive manure from any other sources (neighbor's livestock, etc.) Yes No

C. Method of spreading manure: (Check all that apply)

Injection Spread on soil surface Spread on soil surface With immediate tillage Irrigation Other

5. This section is to help us determine the types and amounts of manure produced at the feedlot, and how and where it is stored. A list of types of animals and facilities is provided to assist you in describing the facilities. Select the best terms from the list to describe the feedlot, or describe in your own terms if none are appropriate.

A. Feedlot Facility Type	Example	Barn 1	Barn 2	Barn 3	Barn 4	Barn 5	Information For New construction
Write dimensions in the space below (length X width in feet)							
Total confinement barn	36 x 100						
Partial confinement barn							
Open lot with runoff controls							
Open lot without runoff controls							
B. Animal type (List maximum number of animals)							
Beef cows							
Calves (150-500 lb)							
Feeder cattle (500-1200 lb)							
Dairy cows							
Young dairy stock (500-1000 lb)							
Replacement heifers (1000 lb)							
Gestating sows or gilts							
Farrowing sows							
Boars							
Nursery pigs (Up to 50 lb)							
Grower/feeder pigs (40-100 lb)							
Finishing pigs (100 lb-Market wt)	250						
Sheep							
Turkeys							
Pullets							
Layer chickens							
Broiler chickens							
Horses							
Others							
C. Floor Type							
Place "X" in appropriate box							
Slatted floor	X						
Concrete floor							
Dirt floor							
D. Manure Storage							
Write dimensions in the space below (length x width x depth in feet)							
Poured concrete pit	38x100x4						
Earthen holding basin							
Above-ground concrete tank							
Manure pack on lot or floor							
Glass-lined steel tank							
Concrete block or stave pit							
Aerated lagoon							
Stacking slab							
Other (Describe)							
E. How often scraped or emptied?							
	Twice per year						

If you have more than six barns or more than one expansion, please continue to list information about those facilities below or on another sheet:

6. These materials should accompany this application:

Enclosed?

A. Draw a sketch of the existing farmstead and any proposed facilities. Also include an Agricultural Stabilization and Conservation Service (A.S.C.S.) aerial photograph of the farmstead and all fields where manure will be spread.

Yes No

Show the location of tile inlets, wells, abandoned wells, manure storage, rivers or lakes, sinkholes, all buildings, water courses within 1000 feet of the livestock facilities, etc. Show the approximate path that water running off the outside lots will follow during spring snow melt or after a heavy rain.

B. Enclose a copy of a Soil Conservation Service (SCS) soil map and indicate the location of the proposed facility.

Yes No

These maps and aerial photos may be available at your local county A.S.C.S. and S.C.S. offices.

If this application is for construction of a manure storage basin larger than 500,000 gallons, for an earthen manure storage basin, or for below ground manure storage, you should also include:

C. Plans for the storage basin, including dimensions and cross-sectional views.

Yes No

D. A soil boring log from the storage site. The soil boring should be to a depth of two feet minimum below the bottom of the manure storage area, and the soils classified using the U.S.D.A. or Unified classification system.

Yes No

7. Other permit requirements

A. Have all local zoning permits been applied for? Which permits, if any, are pending?

Yes No

B. Have you ever been subject to any type of legal action or cited for alleged environmental harm caused by a feedlot under your management or ownership? (If you have, please attach to this application a short statement on a separate sheet explaining the circumstances surrounding this action.)

Yes No

C. If this feedlot will be operated by someone other than the owner under a leasing agreement, please attach a copy of the signed lease agreement to this application.

8. General comments from assisting official On-Site Inspection Conducted? Yes No

Signature of Assisting Official

Title Phone

Address

9. Applicant's Agreement

The undersigned applicant, in accordance with Minnesota Rule 7020 for the control of pollution from animal feedlots, hereby applies to the Minnesota Pollution Control Agency for a permit to construct and/or operate an animal feedlot. Applicant further agrees to complete an application for a National Pollutant Discharge Elimination System (NPDES) Permits if required by the MPCA. The MPCA may require additional information for evaluation of the permit application.

I hereby certify that the construction and/or operation of the above described animal feedlot will be in accordance with the plans, specifications, reports and related communications approved by the MPCA and on file in its office; and in accordance with the conditions which have been or may be imposed in the permit or any applicable regulations or standards of the MPCA. I also certify that the information contained in this application is true, complete and accurate. (Any knowingly false or misleading statement will be subject to penalties provided by law.)

Signature of Applicant(s) Date



Appendix D. Testing Laboratories

The following is a partial listing of laboratories in the region that offer analytical services of benefit to agricultural producers. Nutrient analysis of manure, feed analysis, and pesticide residue analysis are some of the services that these laboratories offer. It is important to personally contact these laboratories in order to obtain information regarding price structure and sample preparation before submitting any samples for analysis.

Any reference to specific companies or individuals is only for reference purposes and does not constitute an endorsement of those companies or individuals.

Ag-Vise Laboratories
902 13th Street N
Benson, MN 56215
(612) 843-4109

Centrol Laboratories
13611 B Street
Omaha, NE 68144
(402) 344-7770

Ingman Laboratories
2945 34th Avenue South
Minneapolis, MN 55406
(612) 724-0121

Minnesota Valley Testing Laboratories
P.O. Box 249
1126 North Front Street
New Ulm, MN 56073
1-800-782-3557

Tri-State Laboratories
P.O. Box 14929
Grand Forks, ND 58208
(701) 772-1061

Woodson-Tennant Laboratories
3507 Delaware Ave.
Des Moines, IA 50313
(515) 265-1461

Glossary

Aerobic—having or occurring in the presence of free oxygen.

Ammonia—the nitrogen component of the gas (NH_3) released by the microbiological decay of plant and animal proteins. (The term sometimes refers to the total of NH_3 and the ammonium ion, NH_4^+ .) Ammonia is the primary form of nitrogen applied in fertilizers.

Ammonia volatilization—the loss of ammonia to the atmosphere.

Ammonium—an ion (NH_4^+) formed when ammonia comes in contact with water. Ammonium binds tightly to soil particles and therefore is not typically leached into the groundwater.

Anaerobic—having or occurring in the absence of free oxygen.

Anaerobic lagoon—a structure to treat animal waste by predominantly anaerobic biological action using anaerobic or facultative organisms, in the absence of air, for the purpose of reducing the organic matter in wastes.

Broadcast—the spreading or application of manure on top of the soil surface.

Composting—a process of aerobic biological decomposition characterized by elevated temperatures that, when complete, results in a material that is relatively inert, safe, and makes an excellent soil conditioner.

Deep pit—a deep (6-8 feet) storage area directly below an animal confinement building.

Denitrification—the chemical or biological process in which nitrate or nitrite is reduced to nitrogen gas.

Earthen basin—A large hole dug in the ground, typically lined with clay or some synthetic material, in which manure is stored. The basin is emptied at least once per year.



EMPs/environmental management practices—a practice or combination of practices found to be the most effective yet practicable means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Facultative—having or occurring in the presence or absence of free oxygen.

Flushing system—a flushing system is a manure collection system that uses large volumes of water flowing down shallow gutters to scour and clean the pig dunging area several times per day. The shallow gutters can be open gutters or gutters under open flooring.

Gravity drain—a system where manure is temporarily collected in shallow gutters under a slotted floor. The gutters are drained on occasion by means of a plug or valve. Manure then drains or is pumped to a long-term storage area.

Groundwater—the supply of fresh water that forms a natural reservoir under the earth's surface.

Immobilization—the assimilation of inorganic forms of nitrogen by plants and microbes, producing various organic nitrogen species.

Incorporation—the tilling of the soil after the broadcasting of manure to move the manure from the surface of the soil to under the soil surface.

Injection—the application of manure underneath the soil surface.

Inorganic nitrogen—nitrogen in the form of ammonia, ammonium, nitrates, nitrites, nitrogen gas, or nitrogen oxides.

Lagoon—a treatment structure, typically earthen, for agricultural wastes. Lagoons can be aerobic, anaerobic, or facultative depending on their loading and design. Lagoons can be one stage or multi-staged. An anaerobic lagoon is different from earthen storage in that the lagoon is



managed to allow for treatment of the manure waste. Anaerobic lagoons are only partially pumped each year (approximately one-third of the total volume) whereas earthen storages are emptied once or twice a year.

Leaching—the removal of soluble constituents, such as nitrates or chlorides, from soils or other material by water.

Manure—the fecal and urinary excretions of livestock and poultry.

Methemoglobinemia—a health condition associated with exposure to nitrates. This condition occurs when nitrite is absorbed into the blood stream where it reacts with hemoglobin to produce methemoglobin, thus impairing the blood's ability to carry oxygen. This condition is commonly known as "blue baby syndrome."

Nitrate (NO_3^-)—the nitrogen component of the final decomposition product of the organic nitrogen compounds. Nitrate is extremely water soluble and its negative charge excludes it from adsorption onto soil particles. These characteristics render it highly susceptible to leaching.

Nitrification—the biochemical transformation by oxidation of ammonium to nitrite and nitrate.

Nitrite (NO_2^-)—nitrite is an intermediate product in the conversion of ammonium to nitrate. Nitrite is extremely unstable (nearly immediately converting to nitrate) and therefore is rarely detected in groundwater.

Nitrogen—a chemical element, commonly used in fertilizer as a nutrient, that is also a component of animal wastes.

Nitrogen cycle—the succession of biochemical reactions that nitrogen undergoes as it is converted to organic or available nitrogen from the elemental form. Organic nitrogen in waste is oxidized by bacteria into ammonia (NH_3). If oxygen is present, ammonia is bacterially oxidized,

first into nitrite (NO_2^-), and then into nitrate (NO_3^-). If oxygen is not present, nitrite and nitrate are bacterially reduced to nitrogen gas, completing the cycle.

Nutrients—elements or compounds essential to growth and development of living things (e.g., nitrogen, phosphorus, potassium).

Odor—foul scent or aroma. Most odors emanating from swine production are due to decomposing swine manure.

Organic matter—undecayed plant and animal residue.

Organic nitrogen—nitrogen in the form of urea, proteins, or amino acids.

pH—measure of acidity.

Phosphorus—one of the primary nutrients required for the growth of plants. Phosphorus is often the limiting nutrient for the growth of aquatic plants and algae.

Pollutant—a resource out of place that causes unwanted or undesirable changes in the environment.

Pollution—the presence in a body of water (or soil or air) of a substance in such quantities that it impairs the water's usefulness or renders it offensive to the senses of sight, taste, or smell.

Runoff—the part of precipitation or irrigation water that flows across building or land surfaces and eventually appears in surface streams or water bodies.

Scraper system—a system of removing manure from a shallow gutter by means of blades scraping the gutter surface.

Settling basin—a concrete or earth-bottomed settling structure where the solids in runoff or the waste stream settle out.

Slotted floor—floor in a facility that has open spaces to allow manure and other waste material to pass through.

Stockpile—long term solid manure storage.

Volatilization—see *ammonia volatilization*.

Waste stream—any unwanted material originating from the farm and making its way from the farm to some end point — typically land disposal. Material typically includes manure, bedding, water, and feed wastage.





Index

- agitation 15, 19
Agricultural Utilization Research Institute (AURI) 24
Agriculture Stabilization and Conservation Service (ASCS) 25
ammonia 4-7, 12-15, 17, 21
application *see manure*
Board of Water and Soil Resources (BWSR) 24
calibration 19
capacity 12, 14
cover 7, 15-16, 21
deep litter 12
deep pit 13, 14-15
Department of Natural Resources (DNR) 24
digester 17-18
disposal (dead pigs) 21-22
feed efficiency 11-12
flooring 12-13
flushing 13
gravity drain 13
incorporation *see manure*
injection *see manure*
lagoons 17-18
manure
 application 18-21
 incorporation 20-21
 injection 18-21
 production 10-12
 separation 17-18
 stockpile 14-16
 treatment 17-18
manure management plan 17, 18, 21
Minnesota Board of Animal Health 21-22, 24
Minnesota Pollution Control Agency 21-22, 24-25
nitrogen 4-6, 18-21
nitrogen cycle 4-5
nutrients 3, 4-6, 11-12, 17-20
odor 7
pasture 13
permits 10, 21-22
phosphorus 4-6, 11, 17, 18-20
production *see manure*
record keeping 19, 21-22
runoff 4, 6, 8-9, 13, 14-15, scrapers 12-13
separation distance 9, 15, 19-20
Soil and Water Conservation District (SWCD) .. 24
Soil Conservation Service (SCS) 25
stockpile *see manure*
survey 1
timing 19
utilization 18-21



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7/28/94

**BOARD OF WATER & SOIL RESOURCES
ROOM - TECH II
CRAGUN'S CONFERENCE CENTER
2001 PINE BEACH ROAD WEST
BRAINERD, MN 56401
July 28, 1994**

APPOINTED MEMBERS PRESENT: Jim Nielsen, Barb Uppgaard, Barb Cobb, Ted Lovdahl, Warren Rodning, Dwain Otte, Glenn Annexstad, Howard Peterson, Kathleen Roer, Marvell Tripp, Jim Rossman and Tim Hvidsten.

AGENCY MEMBERS PRESENT:

Fred Bergsrud, Minnesota Extension Service (MES)
Wayne Anderson, Pollution Control Agency (PCA)
Mark Dietrich, Minnesota Department of Agriculture (MDA)

AGENCY MEMBERS ABSENT:

Kim Benson-Johnson, Minnesota Department of Health (MDH)
Wayne Edgerton, Minnesota Department of Natural Resources (DNR)

OTHERS PRESENT:

Pat Wulff, Minnesota Lakes Association (MLA)
Gary Nordstrom, Soil Conservation Service (SCS)

STAFF PRESENT:

Ron Harnack
Dave Behm
Wayne Zellmer
Ron Shelito
Brian Dwight
Vicky Erbele

Chairman Nielsen called the meeting to order at 8:35 a.m.

Adopt Agenda - The agenda was approved as amended.

**** 94-38 Minutes of June 22, 1994** - Moved by Ted Lovdahl, seconded by Howard Peterson, to approve the minutes of the June 22, 1994, as circulated. Affirmative: Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Roer, Rodning, Rossman, Tripp, Uppgaard and Nielsen. Opposed: None. Carried.

Chairman's Report - Jim Nielsen reported that the Farm Bill Futures draft has received approval by the Department of Natural Resources (DNR). A copy of the draft is being distributed to farm and conservation groups for comment; responses should be received by mid-August. A "Mid-west Governor's Conference on the Future of the Farm Bill" will be held in Lincoln, Nebraska, on August 21-23, 1994. Chairman Nielsen would like to have the Governor use the draft document to present key issues in development of the next farm bill.

Director's Report: Ron Harnack reported that wetlands were a big work item for staff again this past month. One half of staff time in the northern region and metro region has been spent on wetlands.

Ron stated that during the Legislative Water Committee tour of Wilkin and Grant counties, there were four points (needs) identified: 1) research; 2) more emphasis on technical assistance; 3) the need for financial assistance; and 4) increased education about the relationship of the financial and conservation areas of farming.

Ron commented on interagency coordination. Staff has had meetings with agencies to address conflicts or perceived conflicts in the implementation of BWSR programs. Wetlands, stormwater and the ability of SWCDs to administer feedlot ordinances under agreements with the county are some of the issues that need to be addressed.

Ron has spent two days with BWSR Marshall staff and will spend time with other offices also.

Committee Reports:

Dispute Resolution Committee - Kathleen Roer reported that they need to set up meetings for the WCA reviews.

Education Committee - Tim Hvidsten reported that the Education Committee will meet today.

Feedlot Committee - James Rossman reported that the Feedlot Committee met on June 30, 1994, in Mankato. The Legislature established a committee to replace the Feedlot

Advisory Group (FLAG). The group is now progressing under the direction of the Pollution Control Agency and the Department of Agriculture.

Ron Harnack reported that they are in the process of filling the feedlot position in Marshall that was vacated when Brad Matlack moved to Duluth.

Reinvest In Minnesota/Permanent Wetland Preserves (RIM/PWP) Rule Adoption -

94-39 ** Dave Behm reported that he did not receive a request for a hearing in the rules; he did receive two written comments and responded to those comments. The changes resulting from the comments are considered insignificant and for clarification only. Motion made by Dwain Otte, seconded by Barb Cobb, to adopt the rule. Affirmative: Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Rodning, Roer, Rossman, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

Cost-Share Allocation Committee Report - Wayne Zellmer gave an update on the cost-share revision effort. Dwain Otte was appointed chairman of the cost-share retooling committee. The committee made considerable progress towards a recommendation for the next BWSR meeting.

Soil Conservation Advisory Committee Report and Recommendations - Dave Behm presented the Soil Conservation Initiative Strategic Plan. Glenn Annexstad commended Dave for the good work putting the packet together. Discussion followed. Next month staff will present specific recommendations for endorsement.

Jim Rossman asked where the Conservation Reserve Program (CRP) stands. It was stated that congressional action will be required to continue the program. Most conservation organizations and states have taken positions supporting reauthorization and have presented criteria to focus or target available funding. BWSR has taken a position in the draft "farm bill initiative." Discussion followed regarding putting county dollars into soil survey updates and digitization.

Model ordinance is being sent to the local units of government.

Minnesota Forestry Improvement Program (MFIP) Allocations - Wayne Zellmer

94-40 ** presented the Minnesota Forestry Improvement Program (MFIP) allocations. Motion was made by Barb Uppgaard, seconded by Lovdahl, to accept the allocation report. Affirmative: Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Rodning, Roer, Rossman, Tripp, Uppgaard, and Nielsen. Carried.

Ron Harnack gave the challenge grant report. There was a discussion about counties that have not accepted the Wetland Conservation Act (WCA). Should they be reviewed as eligible or ineligible? Also, it needs to be resolved whether they should be eligible for next year's block grant. The challenge grant criteria were sent out, it did not exempt the counties that have not adopted the WCA. Board discussed options and decided not to

take any action; therefore, the applications will be reviewed as part of the normal review process.

**** 94-41 Cottonwood SWCD Waiver Request** - Ron Harnack reported that the request was related to a design deficiency for a feedlot. Motion by Warren Rodning, seconded by Tripp, to approve the request. Affirmative: Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Rodning, Roer, Rossman, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

**** 94-42 Per Diem and Expense Policy** - Ron Harnack reported on the per diem and expense policy. Discussion followed. Paragraph eight was changed to paragraph seven and reads as follows: "Travel by a Board member for a regular meeting, special meeting, or committee meeting exceeding 100 miles and up to 200 miles shall be entitled to claim one per diem for travel." Paragraph seven shall be numbered paragraph eight. A motion was made by Ted Lovdahl and seconded by Dwain Otte to accept the per diem and expense policy with the changes to Paragraphs seven and eight. Voting affirmative was Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Rodning, Roer, Rossman, Tripp, and Nielsen. Voting negative was Barb Uppgaard. Motion carried.

Advisory Reports:

Minnesota Lakes Association (MLA): Pat Wulff enjoyed the tour and was glad to see the Board focus efforts on lakes.

Soil Conservation Service (SCS): Gary Nordstrom commented that the 1995 appropriations went into conference yesterday, he has not heard results as yet. He is involved with launching the Americorp Program to assist students with college education costs. On August 16 there will be a session on total quality management.

Minnesota Association of Watershed Districts (MAWD): Howard Peterson reported that MAWD hosted a tour of the Upper Minnesota River Watershed. People on the tour (which included part of South Dakota) were enthusiastic about the accomplishments between South Dakota and Minnesota, he reported.

Barb Uppgaard said that she would like to have staff brought in from field offices to report at Board meetings. Ron Harnack said that it had been done in the past, however, time on the agenda became an issue.

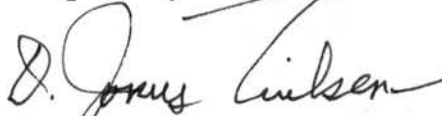
Board members commented on Wednesday's tour. Consensus was that it was noted that it was a good tour; the breakout sessions were excellent; and it gave people in Greater Minnesota a chance to interact with all Board members.

Wayne Anderson, PCA, stated that the Federal Clean Water Act appears dead for this congressional session. Apparently, wetlands were the primary issue that caused the delay.

Mark Dietrich of the MDA talked about the Minnesota River Assessment Project and keeping farmers informed.

**
94-43 Moved by Ted Lovdahl, seconded by Warren Rodning, to adjourn the meeting at 12:00 p.m. Affirmative: Annexstad, Cobb, Hvidsten, Lovdahl, Otte, Peterson, Rodning, Roer, Rossman, Tripp, Uppgaard, and Nielsen. Opposed: None. Carried.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "D. James Nielsen", written in dark ink.

D. James Nielsen
Chairman

STATE OF MINNESOTA
Office of the Attorney General

TO : **RON HARNACK**
Executive Director
BWSR

DATE : June 29, 1994

FROM : **MATTHEW B. SELTZER**
Assistant Attorney General

PHONE : 296-0692 (Voice)
296-7000 (TDD)

SUBJECT : **BWSR Board Member Expense Policy**

You asked me to look at the June 10, 1994 version of the Board of Water and Soil Resources Board Expense Policy ("BWSR Expense Policy"). I understand that this policy was adopted in March, 1994. A copy of the document is attached for convenience of reference.

The BWSR Expense Policy generally seems to comply with state law. This conclusion is based upon my review of the applicable statutes. However, I have not reviewed the expense policies of other state boards, nor have I consulted with the Department of Finance or the Legislative Auditor. Thus, I am unable to comment on whether the BWSR Expense Policy is consistent with the policies of other boards or whether the BWSR Expense Policy would be found to be acceptable by the Department of Finance or the Legislative Auditor.

My conclusion that the BWSR policy generally complies with applicable statutes is subject to the following comments and clarifications:

1. Minn. Stat. § 103B.101, subd. 1(d) provides that the compensation of BWSR board members shall be as provided in Minn. Stat. § 15.0575. Minn. Stat. § 15.0575, subd. 3 provides as follows:

Members of the boards may be compensated at the rate of \$55 a day spent on board activities when authorized by the board, plus expenses in the same manner and amount as authorized by the commissioner's plan adopted under section 43A.18, subd. 2. Members who, as a result of time spent attending board meetings, incur child care expenses that would not otherwise have been incurred, may be reimbursed for those expenses upon board authorization. Members who are full-time state employees or full-time employees of the political subdivisions of the state may not receive the daily payment, but they may suffer no loss in compensation or benefits from the state or a political subdivision as a result of their service on the board. Members

who are full-time state employees or full-time employees of the political subdivisions of the state may receive the expenses provided for in this subdivision unless the expenses are reimbursed by another source. Members who are state employees or employees of political subdivisions of the state may be reimbursed for child care expenses only for time spent on board activities that are outside their normal working hours.

For present purposes, a key feature of this statute is the provision that compensation must be limited to "board activities." Furthermore, it can fairly be implied that such board activities for which compensations is available must be reasonable and necessary to carry out the purposes of the board. All payment of per diems should be judged by the standard of whether the activities constitute reasonable and necessary board business. Thus, even if an activity fits within the technical requirements of the BWSR Expense Policy, payment would be improper unless the activity is reasonable and necessary board business.

2. Payment of per diems and expenses to any member of the board who is a full-time state or local government employee would be limited by the applicable language of the statute.
3. Paragraph 2 of the BWSR Expense Policy provides for one per diem for four plus hours spent on meeting preparation and allows for the accumulation of time for this purpose. It would be significant to know whether this policy is consistent with the policies of other boards and how it would be viewed by the Department of Finance and the Legislative Auditor.
4. Paragraph 3 of the BWSR Expense Policy allows for the payment of per diems for the day prior and the day after the meeting for board members who travel more than 200 miles each way. Consistent with paragraph 7 of the Expense Policy, payment for the day prior or after the meeting should only be made if the travel actually occurs on such days prior to or after the meeting. Furthermore, payment should only be made if it was reasonable and necessary for the travel to occur prior to or after the meeting. For example, if a meeting is scheduled for 3:00 p.m., it may be that the travel to the meeting actually would (and should) occur on the day of the meeting. Thus, in this case, there should be no payment for travel to the day prior to the meeting. In other circumstances, a meeting might be over relatively early in the day (such as a meeting that runs from 9:00 a.m. to 12:00 noon). In this case, the travel home may well occur on the day of the meeting and there may be no reason based upon board business to travel on the day after the meeting. If this is true, then there should be no payment of per diem for the day after the meeting.
5. Paragraph 5 of the BWSR Expense Policy provides for the payment of per diems for conventions and tours. Again, it would be significant to know whether this policy is consistent with the policies of other boards and how it would be viewed by the Department of Finance and the Legislative Auditor. Payment of a per diem for attendance at a convention or on a tour should only

be made if the board member is performing a board activity and the activity is reasonable and necessary for the business of the board. Obviously, a per diem should not be paid if the board member will be attending the meeting on behalf of other organizations or entities or if the board member will be compensated by other organizations or entities for attending the meeting.

6. Paragraph 7 of the BWSR Expense Policy provides that no more than one per diem per day will be allowed. This is consistent with Minn. Stat. § 15.0575, subd. 3 (emphasis added) which limits compensation to "\$55 a day." Paragraph 7 of the BWSR Expense Policy goes on to provide that committee meetings shall be scheduled in conjunction with monthly board meetings whenever possible. This represents an appropriate effort to control expenses.
7. Proposed paragraph 8 of the BWSR Expense Policy provides for the payment of per diems for travel days for travel between 100 and 200 miles. This provision has not yet been adopted by the BWSR Board. My comments on this proposed provision are similar to my comments on the provision for the payment of per diems for travel days to members who travel more than 200 miles each way. The question is whether travel actually occurs on a day other than the meeting day and whether it is reasonable and necessary under the circumstances for the travel to occur on another day.

I trust that these comments will be of assistance to you. There are certain to be special circumstances that will arise from time-to-time which will raise additional questions. Please contact me if I can provide you with further comments or be of assistance in any way.

June 10, 1994

**BOARD OF WATER & SOIL RESOURCES
BOARD MEMBER EXPENSE POLICY (March 1994)**

* **PER DIEM (\$55\DAY):** Per diem is authorized for Board members for the following:

1 - One per diem and expenses for Regular monthly Board meetings, meetings of committees to which members are assigned, and special meetings called by the Board. This does not apply to meetings of organizations, groups and local governments that are the primary responsibility of BWSR staff.

2 - One per diem for 4 plus hours spent on preparation for monthly Board meetings, committee meetings or special meetings of the Board. Members may accumulate time for these purposes, however time in excess of 4 hours for a specific meeting cannot be banked for a another or following meeting.

3 - Per diem for travel by Board members for a regular meeting, special meeting of the Board or committee meeting where Board members travel greater than 200 miles each way using vehicular transportation. A per diem is authorized for the day prior and the day after the meeting.

4 - Child care expenses incurred as a result of monthly Board meetings, special or committee meetings of the Board shall be compensated as defined in MS 15.0575, subd 3.

5 - Per diem and expenses incurred at other functions such as AMC, MASWCD, and MAWD conventions or tours under the conditions defined in items 1 thru 4 provided such meetings are authorized by the Board, Chair of the Board or the Executive Director.

6 - Expenses incurred by Board members for attendance at official meetings of the Board will be reimbursed consistent with the authorized under the commissioner's plan adopted under section 43A.18, subd 2. The rates are reflected in the attached document "EXPENSE REIMBURSEMENT".

7 - In no instances will more than one per diem per day be permitted under these provisions.

The Board also directed committee members and staff to schedule committee meetings in conjunction with monthly board meetings whenever possible.

A proposal that was brought by the per diem committee after the Board adoption of the draft policy is as follows:

8 - Travel by Board member to a regular meeting, special meeting, or committee meeting exceeding 100 miles and up to 200 miles shall be entitled to claim one per diem for travel the day prior to a meeting and one per diem for the day of the meeting. A per diem for the day following the meeting will be authorized if a meeting extends until 5:00 pm or if inclement weather develops. This provision was not considered by the Board and is not applicable at this time.



MARK B. DAYTON
STATE AUDITOR

STATE OF MINNESOTA
OFFICE OF THE STATE AUDITOR

SUITE 400
525 PARK STREET
SAINT PAUL 55103

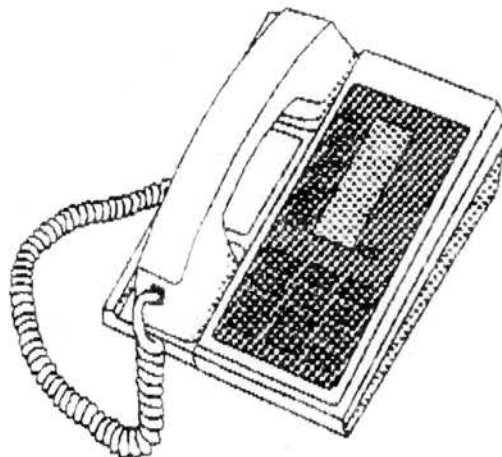
(612) 296-2551

FACSIMILE TRANSMITTAL

TO: Ron Harnack	FR: Mark Kew
CO: BWSR	PH: 296-4717
FAX: 297-5615	RE: Per Dirms

No. of pages including this cover sheet: 8**** IMPORTANT NOTICE ****

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COMMENTS:

Attny Gen's Opinion per our
discussion

OSA FAX #612-296-4755



OFFICE OF THE ATTORNEY GENERAL

State of Minnesota

ST. PAUL 55155

HUBERT H. HUMPHREY III
ATTORNEY GENERAL

April 28, 1994

RECEIVED
APR 29 1994
STATE AUDITOR

Mark B. Dayton
State Auditor
Suite 400
525 Park Street
Saint Paul, MN 55103

Dear Mr. Dayton:

In your letter you set forth substantially the following:

FACTS

Minnesota law generally authorizes county commissioners to receive "per diem" payments in addition to salary, for the performance of official duties.

It is current practice in many counties to interpret "per diem" as a per meeting fee. However, we find no authority for the payment of a per meeting fee under current Minnesota Statutes, and therefore seek your advice on the authority for these payments.

Crow Wing County, for example established a per meeting fee of \$25.00 on December 30, 1991, for county meetings, subject to an exception for Planning Commission and Board of Adjustment meetings, which are \$30.00 per meeting. This resolution was reaffirmed on October 5, 1993.

During the course of our review of per diem payments we noted that multiple payments of \$25.00 were paid for the same day for attendance at such meetings as community health service, planning committee, solid waste committee, ambulance meetings, community corrections, and county health. In addition, meeting fees for sub-committees of the Board are paid for such meetings as building committee, county highway, land and forestry and county sheriff. We noted instances where per meeting fees were paid for attendance at township, fire and municipal council meetings on a day where a per meeting fee was also paid for attendance at a committee of the County Board or a special meeting of the Board.

More generally, we are advised by our field staff that some counties also pay a per diem fee for attendance at the regular board meeting and all other special

Mark B. Dayton

Page 2

April 28, 1994

meetings and committees, allowing multiple per diem payments for attendance at these events on the same day. In addition, it has been reported to us that commissioners submit per diem claims for attendance at township meetings and other meetings of local units of government. The individual commissioner determines whether attendance and submission of claims for per diem payment is appropriate.

You then ask substantially the following questions.

QUESTION ONE

May counties establish a schedule of "per meeting" payments rather than per diem payments for county commissioners in addition to their salaries?

OPINION

We answer your question in the negative. Compensation for county commissioners in most counties is provided pursuant to Minn. Stat. §§ 375.055-375.065 (1992). Minn. Stat. § 375.055, subd. 1, provides in part:

The county commissioners in all counties, except Hennepin and Ramsey, shall receive as compensation for services rendered by them for their respective counties, annual salaries and in addition may receive per diem payment and reimbursement for necessary expenses in performing the duties of the office as set by resolution of the county board. The salary and schedule of per diem payments shall not be effective until January 1 of the next year. The resolution shall contain a statement of the new salary on an annual basis. The board may establish a schedule of per diem payments for service by individual county commissioners on any board, committee or commission of county government including committees on the board, or for the performance of services by individual county commissioners when required by law.

(Emphasis added)

Minn. Stat. § 475.06, subd. 1, provides in part:

The members of the county boards in counties other than Hennepin, Ramsey, and St. Louis, may be paid a per diem pursuant to Section 375.055, subdivision 1, for each day necessarily occupied in the discharge of their official duties while acting on any committee under the direction of the board, and may be paid their actual and necessary traveling expenses in accordance with Section 471.665 for travel incurred in the discharge of the committee work. Any committee may be comprised of all of the members of the county board.

(Emphasis added)

Mark B. Dayton

Page 3

April 28, 1994

Thus, county commissioners are authorized to receive annual salaries and may also be paid "per diem" for performing the duties of office, including work on committees "under the direction of the board," and individual services as commissioners "when required by law."

As noted in the materials included with your letter, the plain meaning of the term "per diem" is "by the day" or "pay for a day's service" Black's Law Dictionary (Rev. 4th Ed.) 1293. Words in statutes are generally to be construed in accordance with their common and approved usage. Minn. Stat. § 645.08(1) (1992). Thus, we must assume, absent any authority to the contrary, that the "per diem" compensation authorized by the foregoing statutes is intended to be computed and allowed by the day in which services are performed, rather than with respect to each "meeting" attended or each separate task performed. This concept is clearly expressed in Section 475.06, subd. 1, quoted above in stating that the payment may be made for "each day necessarily occupied" in the discharge of duties.

QUESTION TWO

May a county board member receive a "per diem" for attendance at the regular meeting of the board?

OPINION

We answer your question in the affirmative. As noted above, Section 375.055, authorizes the county board of commissioners to provide, by resolution, a salary and schedule of per diem payments to be paid to commissioners for performing "the duties of office." The board is required by statute to meet on the "first Tuesday after the first Monday in January, and on other days it prescribes as necessary for the interests of the county." Minn. Stat. § 375.07 (1992). It seems clear that attendance at meetings of the board is one of the "duties of the office" for which per diem payments may be allowed. Therefore, it is our view that such payment are permitted to the extent prescribed in the resolution of the board establishing the schedule of per diem payments.

This opinion is, however, subject to the provisions of Minn. Stat. § 375.065 (1992), which prohibits any county commissioner whose salary is more than 50 percent of the

Mark B. Dayton

Page 4

April 28, 1994

governor's salary, from receiving any per diem for "attendance at meetings related to the business of any local government unit."

QUESTION THREE

May a county board member receive a per diem on the day of the county board meeting if the member also attends a committee meeting of the board or performs other board related services on that day?

OPINION

The response to Question two above would appear to provide the answer to this question as well.

QUESTION FOUR

May a county board member receive multiple per diem payments on the same day when the board member attends several committee meetings and performs such services as road inspection?

OPINION

We answer your question in the negative. As noted above, the "per diem" authorized by Sections 375.055 and 375.06 is to be paid by the "day" spent in performing the duties of office. However, inasmuch as the law, in many circumstances, does not recognize fractions of a day, it is generally held that no particular length of time spent in a given day is required to entitle an officer to collect per diem for a "day" of work. See, e.g., Op. Att. Gen. 124a, May 19, 1959, Annot. 1 ALR. 276, 277. On the other hand, it is also generally held that an officer cannot collect more than one day's per diem pursuant to the same authority, regardless of the number of hours spent in performing work in a single day. Annot. 1, ALR, 276, 278. Minn. Stat. § 375.055, subd. 1, authorizes payment to commissioners by the day for performing the duties of office. Section 375.06 authorizes the same per diem "pursuant to Section 375.055, subdivision 1" for each day necessarily occupied in the discharge of official duties while acting on any committee under the direction of the board. Thus, it appears that per diem whether for committee work or other "duties of office" is payable under the single authority of Section 375.055, subd. 1.

Mark B. Dayton

Page 5

April 28, 1994

Therefore, it is our view that a county commissioner, when authorized by resolution of the board, may collect one per diem for each day spent in performing the official duties connected with the office, regardless of how few or many separate duties connected with the office are performed in such day.

We recognize, however, that there might exist other statutes which provide independent authority for per diem payments in addition to those authorized by Sections 375.055, 375.06. Minn. Stat. § 375.055, subd. 5, provides in part:

Except as provided herein nothing in this section shall limit the right of a county commissioner to collect and retain any fees, per diem payment made pursuant to subdivision 1, or any mileage or expense allowance, or reimbursement of expenses in attending meetings or in the conduct of the business of a board, commission or committee of county government on which the commissioner serves, which the commissioner is now authorized by any other law to collect and retain in addition to the stated annual salary.

(Emphasis added)

This subdivision has recognized that commissioners, in addition to serving as such, might serve on other bodies of government for which additional compensation is separately authorized by statute. In those situations we have concluded that more than one per diem might be retained for a given calendar day in which a commissioner performs commissioner duties and also performs duties for a statutorily separate body with independent authority to compensate its members. For example, in Op. Atty. Gen. 124a, May 19, 1959, we concluded that a county board member might receive per diem pursuant to Section 375.06 for commission work as part of a road viewing committee, and could also retain per diem for a county welfare board meeting held the same day. As noted in that opinion, Section 393.03 at that time provided that each member of the welfare board may receive per diem "in addition to other salary received from any other source." The opinion noted that "when county commissioners attend meetings of the county welfare board, they do so as members of that board and not as county commissioners."

Mark B. Dayton

Page 6

April 28, 1994

Likewise in Op. Atty. Gen. 124a, April 12, 1972, we concluded that a commissioner could receive two per diem allowances for attending a meeting of the welfare board and a meeting of the hospital board on the same day. Again, at the time, both the hospital board and welfare board were constituted under separate statutes each independently authorizing payment of added compensation.

Thus, there may be instances in which a commissioner might be separately authorized to receive a per diem apart from the one authorized for work as a county commissioner. It appears, however, that such separate authority has been, for the most part, eliminated.

In 1975, when the legislature amended Minn. Stat. § 375.055, subd. 1, to generally authorize the payment of per diem to county commissioners in addition to salary, it also amended other statutes pertaining to various boards and committees related to county government to remove separate authority for payment of per diem to county commissioners who are members, and to direct that Section 375.55, as amended, be the source of per diem authority for commissioners serving with such bodies. Act of June 4, 1975, ch. 301, 1975 Minn Laws 816. See id. §§ 1 (Extension Committee), 2 (drainage proceedings), 4,5 (tax forfeited land sales), 6 (fence viewings) 10 (miscellaneous county boards, agencies or committees), 12 (nursing home boards), 13 (welfare boards), 14 (planning commissions).

We have not located independent authority for payment of per diem other than that provided for in Section 375.055 for work with the committees mentioned in your letter or for such things as "road inspection."¹ Absent such independent authority, it is our view that a commissioner may receive, under Section 375.055, one day's per diem for each day spent in carrying out his or her county duties regardless of how many or few separate tasks are involved.

1. Cf. Op. Atty. Gen. 1930, No. 273, P. 248 (enclosed) which distinguishes between legitimate "committee" work and undertaking of the function of the town engineer.

Mark B. Dayton

Page 7

April 28, 1994

QUESTION FIVE

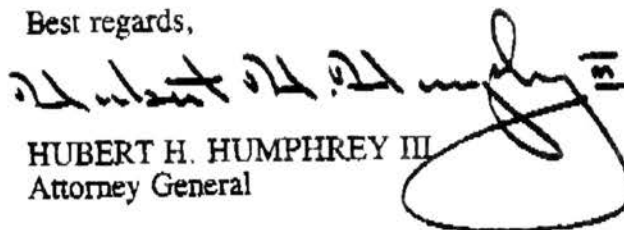
Is there authority to pay a per diem for attendance at meetings of other bodies such as township meetings or fire department meetings and if so, must the annual resolution detail which meetings other than county meetings qualify for per diem?

OPINION

Except as qualified below, we answer your question in the negative. The authority to pay per diem for attendance at such meetings would depend upon whether that attendance could reasonably be viewed as acting on a committee under the direction of the board (Minn. Stat. § 375.06, subd. 1), or service by an individual which is either "required by law" or associated with a "board, committee, or commission of county government," (Minn. Stat. § 375.055, subd. 1). We are not aware of specific instances in which a county commissioner, as such, would be expressly required by law to attend town meetings or fire department meetings. Nor would such groups be considered boards, commissions or committees of the county.

It is, of course, possible that the county board may, in appropriate circumstances, designate one or more commissioners as a committee to perform some fact-finding or liaison function which would necessitate attendance at meetings of some organizations or group outside of county government. In those circumstances, per diem would seem to be authorized pursuant to Minn. Stat. § 375.06, subd. 1. However, we do not find authority for payment of per diem for general attendance where a commissioner simply decides on his or her own to attend such meetings. Cf. Op. Atty. Gen. 1930, No. 273, P. 248; 124-A, June 15, 1951 (copy enclosed).

Best regards,



HUBERT H. HUMPHREY III
Attorney General

Enclosure
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Board member Update

July 1994

The mission of the Board of Water and Soil Resources is to provide leadership enabling local governments to properly manage water and soil resources and to help all citizens be stewards of our irreplaceable natural resources.

Southern Region

- Wetland Conservation Act (WCA) activities/administration by local governmental units (LGUs) was on the increase in the south central counties. Board conservationists (BCs) have been involved in various levels of participation from reassuring telephone calls to on-site inspections with the technical panels. Overall, LGUs are doing a good job of administration.
- The "River Warren" Research Committee made itself a little more known during the month of June. Representatives spoke to the DNR and BWSR staff in New Ulm as well as to the Area VI supervisors and staff in LeCenter. This group is critical of the Minnesota River Assessment Project (MRAP) report because of its focus on agricultural land rather than the landscape of the River Warren (bluff to bluff) which they claim is where much of the sediment in the Minnesota River originates.
- This month BC Chris Hughes assisted with GIS EPPL 7/Local Water Planning Interface installations in Lincoln, Nicollet, and Waseca Counties. With these installations, the southern region is now approximately 25 percent completed; the goal is to have 29 installations completed by mid-winter.
- Sign-up for residents in Watonwan County concerned about septic system enforcement was more than 122 as of June 2, 1994; the feedlot sign-up had reached 35. These individuals have shown an interest in addressing their problems -- if in fact they are problems. Although Regional Supervisor Jeff Nielsen believes this is typical of other county's needs, he has not seen nor heard of sign-ups in counties (such as Waseca or Lesueur) where similar enforcement activity has taken place. As was pointed out at the June 21 meeting of Area VI of the Minnesota Association of Soil and Water Conservation Districts (MASWCD), SWCDs need to provide information to their association or BWSR regarding marketing, design, sign-off, construction, or administrative needs, particularly in view of the State Revolving Fund (SRF), enforcement, and Minnesota River emphasis.
- BCs Tom Fischer, Chris Hughes, and David Sill assisted BWSR Design Engineer Tom Wenzel in completing a survey of the Waseca Experiment Station's recently acquired "wetland farm." In addition to the experiment station using the farm for wetland/farm research, this farm will become the permanent site for the annual WCA advanced delineation training sessions for LGUs in southern Minnesota. This will be an excellent site and opportunity for southern Minnesota

LGUs to sharpen their wetland delineation skills on land that is all too familiar to them--crop land.

- On June 15th, BC Tabor Hoek and DNR staff finalized plans with technical staff of SWCDs and SCS in the southwest region to develop conservation plans on DNR wildlife areas. Plans initially will concentrate on lowering erosion rates on DNR cropland areas to at least "T," the tolerable soil loss to sustain crop productivity, as well as on treatment of site specific erosion problems such as gullies or streambank/lakeshore erosion. Future planning will address water quality standards along with erosion. With DNR being the largest farmer in Minnesota (30,000+ acres under cultivation), this activity will have significant impact on erosion control and public perception.
- Rochester BC Pete Waller's transfer to the Brainerd BWSR office was effective July 5. All of us in the southern region will miss Pete and wish him success in his new work area. We welcome Mary Kells as our new board conservationist in the Rochester office. Mary is very familiar with the activities of local government and BWSR. She started her career in conservation with the Lac qui Parle SWCD as district technician and secretary; from there she moved on to be the coordinator of the Tri-County Conservation Project in the Clearwater River Watershed District; and most recently Mary served as the district manager for the Goodhue SWCD.

Northern Region

The northern region staff had a busy month of June. The highlights are worth further study.

- Duluth BC Mark Nelson did his time in the swamp during June, assisting Pine SWCD on five cease and desist orders. Mark reports many proposed wetland impacts around Hinkley where rapid development in the fast food trade is occurring as a result of the casino. Mark met with Lake County hoping to get them to adopt the Wetland Conservation Act (WCA). Lake, along with four other counties, have still not adopted WCA.
- BC Bill Best reports a new arrival to his family, Ryan Thomas, born May 28. Bill subsequently took a couple weeks off to be home with his family. Congrats to Bill and Ellen. When Bill was brushing up his child-rearing skills, he was busy installing the Land Management Information Center's (LMIC's) Local Water Planning Interface (that's computer stuff) and dataset on the Becker SWCD computer. The district had been chosen last year to be a test site for this system. We are continuing to work out the bugs and hope to be filling other LGU requests soon.
- The DNR hosted a calcareous fen training session for local SWCDs at the urging of Bill and BC Dale Krystosek. Dale and Bill felt it was important for locals and state folks to have an understanding of this rare and unique protected wetland; protected by WCA of course.
- Keith Grow, Brainerd BC, has working with the Snake River crew, Sherburne-Benton joint powers, and Mille Lacs and Pine counties in preparation of challenge grant proposals. Keith says that counties are getting more comfortable in looking at resource needs from a watershed basis and he expects to see some good challenge grant proposals come in. Keith also reports that a number of WCA banking plans are now being reviewed and approved for construction in his area. Some excellent sites are being proposed.

- Northern Supervisor Ron Shelito, Bemidji BC Brian Dwight, and Wetland Specialist John Jaschke met with Kooch, Pennington, Marshall, Lake, and Beltrami counties to discuss their failure to adopt WCA. Although the meeting had some tangible results, we are a long way off from convincing this group to adopt. In a word, they despise WCA, and they don't have much good to say about BWSR and the DNR either. We'll continue to work with this group as long as progress is being made.
- Pete Waller officially got promoted to the northern staff effective July 1. He spent the last two weeks of June getting his family moved and settled. Pete will spend most of July getting oriented to his new work area.

Metro Region

The BWSR Metro Region staff have been extremely busy lately, mostly with the WCA. Jim Haertel documented that he spent all but two work days during June on Technical Evaluation Panels (TEPs) or other WCA related work. Barbara Ohman also devoted a lion's share of her time to the WCA. Despite this, many workload elements of WCA are not getting done. Most other program efforts are consequently not being tended to well. These issues will come out more clearly in the agency program assessment.

Below are some emerging items of which the board should be aware:

- Regional Supervisor Bruce Sandstrom has been spending much of his time in discussions with state, local and regional agencies on the rapidly emerging issue of using wetlands for storm water management. A key issue is a conflict in state policies; one encourages use of wetlands for storm water treatment, while current PCA rules potentially greatly limit such

use without pre-treatment prior to discharge. Also, the U.S. Army Corps of Engineers is now requiring 404 permits for impounding water in wetlands.

- Ramsey District Court issued a summary judgement on Ramsey County's appeal of Rice Creek WD's capital project on Locke Lake. The judgement affirmed the use of ad valorem funding across the watershed but decided that the project was invalid because of failure to follow proper procedure to amend their 509 plan. The city of Fridley has appealed the latter part of the decision. Fridley alleges that the proper procedures to amend the plan were followed and that the only appeal of the capital project was to the BWSR during the plan review process and they failed to appeal in a timely fashion. BWSR staff concurs with Fridley based on current knowledge of the facts.
- A developer in the city of Fridley has appealed the denial of a replacement plan to the BWSR. This matter will have to be decided by the BWSR at its August board meeting. Bruce will coordinate with staff member Doug Thomas in scheduling a meeting with the Dispute Resolution Committee (DRC) prior to the August board meeting.
- The Legislative Water Commission is meeting on August 23 to hear how water planning is going in the state. Metro and non-metro local water planners will be invited to give their perspectives. See Doug or Bruce for further information.

Engineering Section

Area II

- Darrell Apelgrain, BWSR Area II engineer, has orchestrated two meetings

since late June regarding the development of guidelines for road retention projects. Participants in this endeavor include several county engineers, DNR staff, Minnesota Department of Transportation (MnDOT) staff and Al Kean, BWSR chief engineer. Road retention project guidelines were recommended by the interagency flood hazard mitigation team last year.

- HDR Engineering continues to conduct engineering and environmental analyses necessary for the Environmental Assessment Worksheet (EAW) for the RW-22 floodwater detention project. HDR will provide technical input to the DNR, which will review and/or prepare the final EAW.

Feedlots

- Brad Matlack, feedlot specialist, recently provided three days of feedlot training for three new technicians hired for the Redwood River Phase II Clean Water Partnership. He was quite impressed with the enthusiasm and talent exhibited by these technicians, who are located in three different SWCDs. As far as we know, this is the first CWP grant to fund staffing for best management practices (BMPs) implementation.
- The EPA Section 319 grant that has funded Brad Matlack's position for the past year and a half will end on July 31, 1994. We intend to keep Brad on for several months thereafter to provide additional feedlot training for new technicians in the Minnesota River basin (i.e., Redwood River CWP and Blue Earth River Basin Initiative (BERBI) staff) and to help train a new feedlot specialist. Brad will also work to complete some feedlot designs that he is currently working on and provide some assistance to our lakeshore engineer, Gene Clark. It does

not appear that we will be able to fund a position for Brad beyond the end of October. Although we obtained one more year of 319 funding for a feedlot specialist, it is focused on the Minnesota River basin, with Marshall as the office location. We are in the process of filling that position.

Conservation easements

- The retooled application forms and procedures (Application Stage of the retooled program handbook) were mailed to SWCDs in late June. We have heard a number of positive reactions from districts regarding these application materials. Districts can now prepare applications for funding consideration by the BWSR in November. The due date for application submittal to BCs has been set for November 21, 1994.
- Program staff continue to work hard on the finalization of other sections of the retooled handbook. As is often the case, finalization takes longer than expected. Nevertheless, we are keeping the faith and remain confident in the value of our work. The majority of the handbook should be ready for distribution in late August. We intend to conduct two or three review/training sessions in late September and early October.
- We are preparing for discussions with the board in August regarding program funding priorities and the program workplan that was required by the FY95-96 funding appropriation (to be submitted to the Legislative Water Commission).
- We have heard that our second grant proposal under the North American Wetland Conservation Act (NAWCA) for wetland restorations in the Minnesota River basin has ranked quite high nation-

ally. This is a re-submittal of a revised proposal. The first try was unsuccessful.

Lakeshore engineering

- Construction of the Sucker Bay shoreline stabilization project began in early July. Progress has been very good to date. Phase I (rock buttress construction along 1,100 ft. of shoreline) is about half done as of this writing. Gene Clark, lakeshore engineer, has been fulfilling the construction inspection role for the landowners and So. St. Louis SWCD. Field surveys and design work for Phase II (upper surface and groundwater control) are progressing.
- Gene Clark and Al Kean have been collaborating on the final designs for the Two Harbors Campground and Sewall shoreline stabilization projects. We intend to have the plans and specifications for the Two Harbors project ready by early to mid-fall of this year for late fall or early winter construction. Final design of the Sewall project is planned for late fall or winter, with construction next spring.
- We recently received requests for assistance from Clearwater and Itasca SWCDs regarding shoreline and bank erosion problems. Gene visited a number of sites with district staff and provided some technical insights and direction. We must limit our involvement with these sites at this time due to the backlog of North Shore project work that exists. Gene has also visited a number of additional erosion sites along the North Shore during the past month.

Other Engineering Activities

- The recently endorsed Conservation Partnership Technical Advisory Commit-

tee involving the MASWCD, the Minnesota Association of Conservation District Employees (MACDE), SCS and BWSR, met for the first time on July 22. Our primary short-term goal is to develop a consensus recommendation for technical assistance staffing via SRF implementation funds. This will require a broad look at future technical assistance staffing by all of the partners. Our first meeting focused on building a foundation for this work by identifying the desired attributes of an effective technical assistance delivery system and the impediments/problems with the current delivery system. Participation was good. We intend to have a recommendation to the board and SCS by September or early October.

July 1994 Board Presentation:
SOIL CONSERVATION INITIATIVE

- (1) Strategic Plan
 - Soil conservation strategies
 - programmatic pyramid
 - education-incentives-regulations strategies
- (2) Assessment of erosion in Minnesota
 - resource inventories (bar graph of 1967-1987 erosion control needs and adequately protected acres)
 - PCA water quality assessments (table)
- (3) Local water plans' references to soil erosion ordinances (bullet chart)
- (4) BWSR convenes Erosion Ordinance Advisory Committee in 1991
 - model ordinance for agricultural erosion control
 - preliminary report identifies three phases of activities
- (5) BWSR reconvenes and refocusses committee in 1993
 - now named Soil Conservation Advisory Committee
 - completes phase 1 (model ordinance)
 - completes phase 2 (report with recommendations)
 - awaiting phase 3 (legislative action, based on report)
- (6) Overview of report recommendations
- (7) BWSR Strategic Soil Loss Committee prioritization of recommendations

August 1994 Board Presentation:
SOIL CONSERVATION INITIATIVE

- (1) Overview of report recommendations (dozen funding items; additional administrative items)
- (2) BWSR Strategic Soil Loss Committee prioritization of recommendations
- (3) Legislative proposal

STRATEGIC PLAN

BOARD OF WATER AND SOIL RESOURCES

September 1990

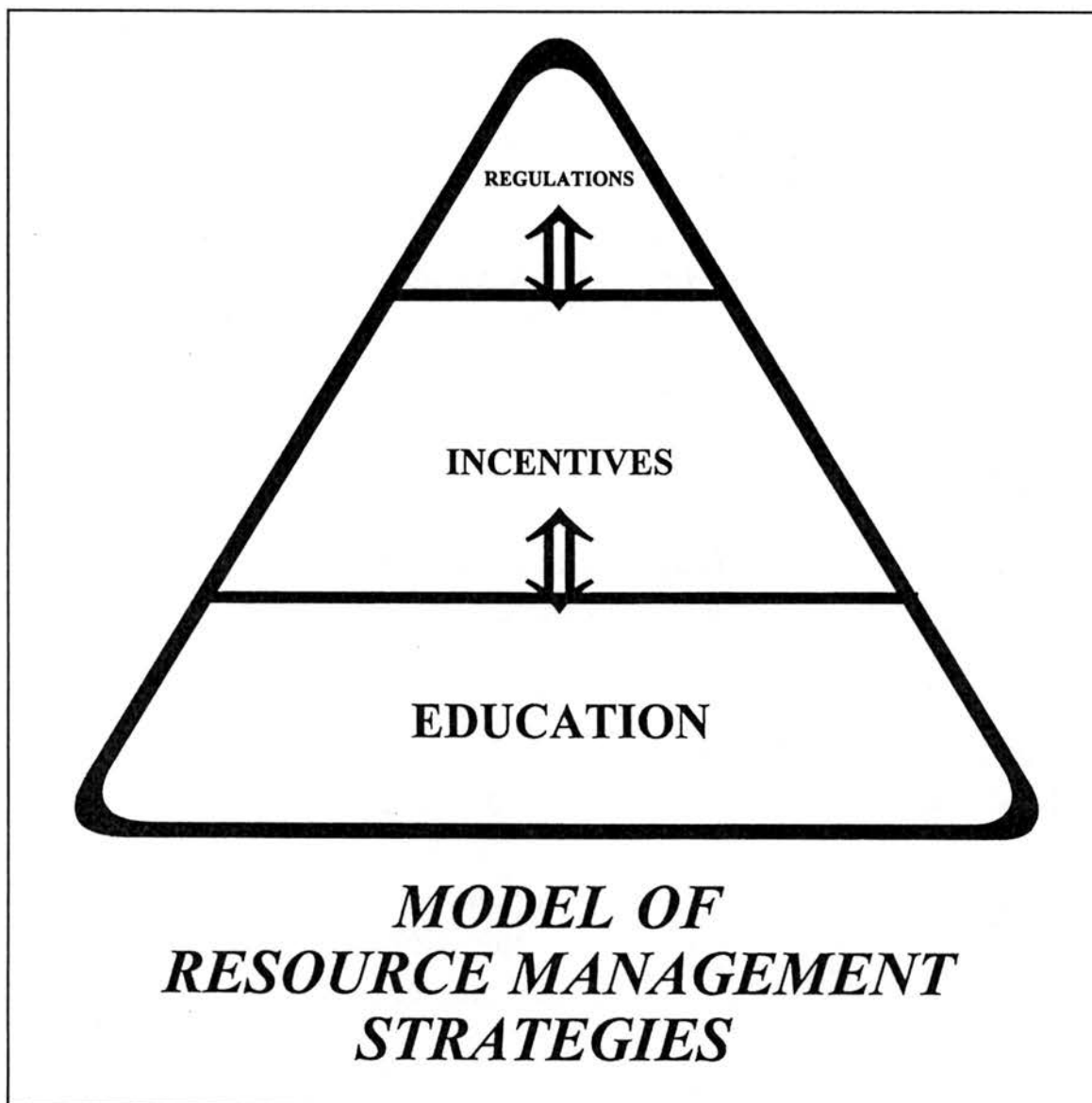
CONTENTS

About the Board	i
Contents	ii
I. Introduction: Minnesota's Water and Soil Resources	1
A. Water Resources	2
B. Soil Resources	3
II. The BWSR's Mission	4
III. Resource Management Issues	6
A. Land Use Alteration	6
1. Wetlands	7
2. Marginal and Sensitive Lands	8
3. Urbanizing Lands	9
4. Forest Lands	10
B. Nonpoint Source Pollution	11
C. Soil Conservation	13
D. Water Quantity Management	15
IV. Resource Management Strategies	16
A. Education	17
B. Incentives	19
C. Regulation	21
V. The BWSR's Future	22

BWSR STRATEGIC PLAN
POSITIONS ON RESOURCE MANAGEMENT ISSUES
Pertaining to a Soil Conservation Initiative

SOIL CONSERVATION:

- Land retirement programs --
targeted to highest priority marginal agricultural lands and
sensitive lands
- Land treatment cost-share programs --
targeted to erosion-prone productive lands
- Retired marginal aglands with severe erosion potential --
do not bring back into production unless excessive soil loss is
prevented
- Soil loss on all lands --
levels at or below soil loss tolerances by 2000
- Local adoption of erosion and sediment control ordinances --
(1) promote as part of local water planning process
(2) local governments adopting and enforcing such ordinances
should be rewarded
- Recover public costs of sediment removal from public property
& rights-of-way --
Authorize local/state governments to assess private landowners
who refuse to take reasonable steps to prevent excessive soil loss



BWSR STRATEGIC PLAN
RESOURCE MANAGEMENT STRATEGIES
(excerpts)

EDUCATION

It is the BWSR's position that its educational activities should include:

- Developing and maintaining local technical assistance and educational services capabilities.

BWSR education-related management strategies include:

- * Providing local governments the capabilities to develop and implement information and education programs through technical and financial assistance.

- * Identifying the needs of local government to successfully implement water and soil management programs and communicating those needs to . . . the legislature.

- * Supporting the educational efforts of other agencies and educational institutions.

- * Providing local government officials and staff with special training regarding water and soil resources management . . .

- * Developing and making available . . . model ordinances, . . . technical guidelines and policies, and other guidance materials to assist local governments in designing and implementing effective and coordinated water and soil management programs.

- * Supporting legislative initiatives for the gathering of resource information and implementation of broad-based public education and information programs, as well as innovative approaches to reaching specific target groups.

BWSR STRATEGIC PLAN
RESOURCE MANAGEMENT STRATEGIES
(excerpts)

INCENTIVES

It is the BWSR's position that incentives should:

1. Be a tool available to local government to enhance local program delivery.
2. Be offered to potentially affected land occupiers to create positive attitudes about proper land management practices.
3. Provide opportunities to dissuade harmful and encourage beneficial land and water use activities.
4. Be provided to landowners who practice good stewardship and create economic disincentives for those who do not.

BWSR incentive-related management strategies include:

* Advocating expanded state and local financing opportunities for implementing elements of approved comprehensive local water management plans . . .

* Assisting local governments in developing local incentive programs.

BWSR STRATEGIC PLAN

RESOURCE MANAGEMENT STRATEGIES

(excerpts)

REGULATION

It is the BWSR's position that local governments with regulatory authorities should:

1. Be provided the governmental powers necessary to address water and soil management issues proactively and be encouraged to use these authorities.
2. Be able to obtain the resources needed to properly administer and enforce local rules and official controls.
3. Couple local regulations with active efforts to educate residents and provide incentives to land occupiers to properly manage water and soil resources.
4. Be encouraged to adopt and enforce local regulations to meet their unique needs.

BWSR's regulation-related management strategies will include:

* Providing general guidance and assistance to local governments seeking to adopt official controls or rules addressing . . . aspects of water and soil resources management.

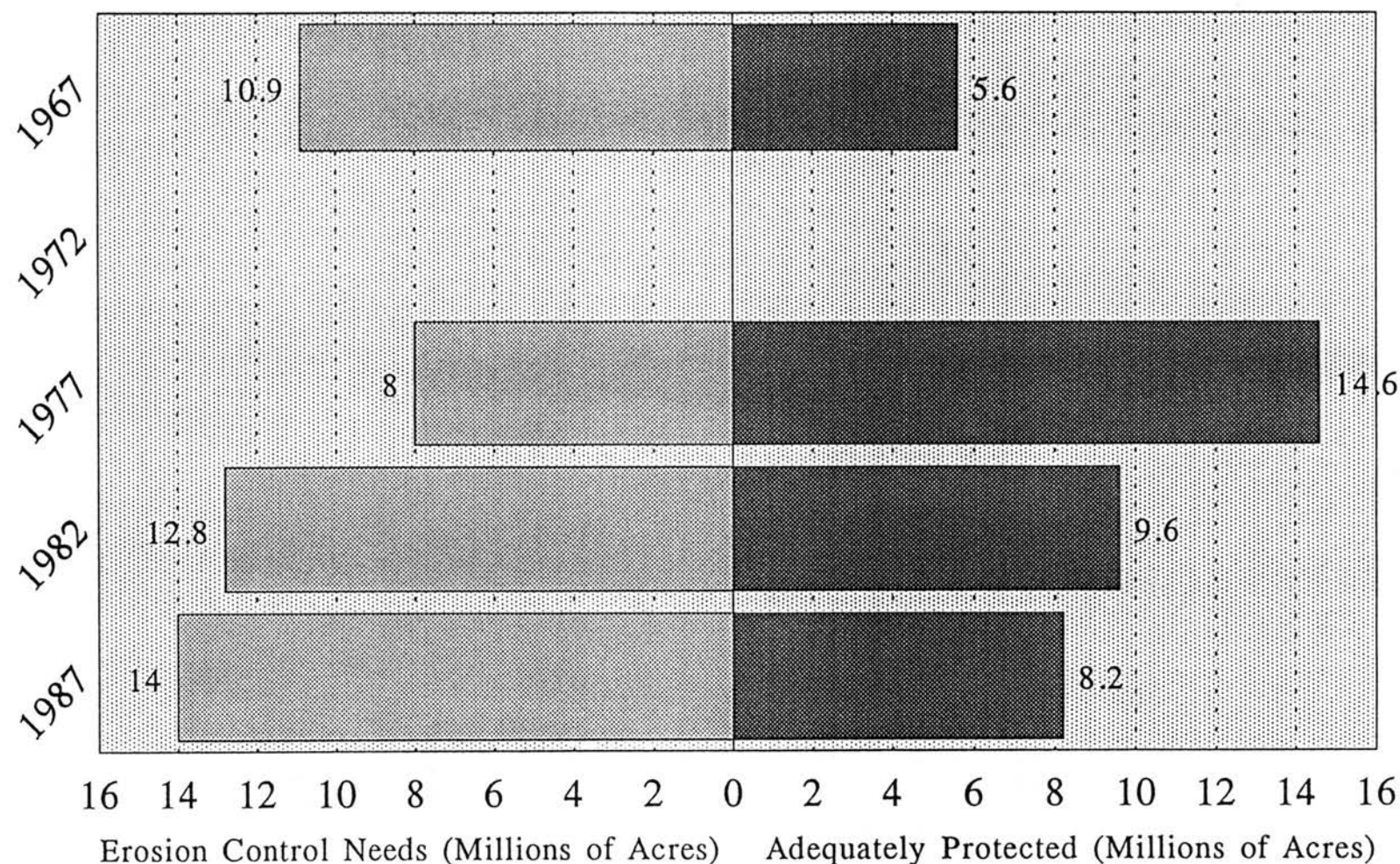
* Collecting, developing, and making available model ordinances and rules for water and soil resources management . . .

* Encouraging local governments to make use of their regulatory authorities in addressing water and soil resources management issues

. . .

EROSION CONTROL NEEDS ON MINNESOTA'S CROPLAND: 1967 - 1987

Year



NOTE: Since 1987, nearly 2 million acres have been enrolled in the federal Conservation Reserve Program and approximately 20% of all cropland is under conservation tillage in Minnesota.

SOURCE: USDA-SCS

K:\APPS\HG\DATA\ECNEEDS1

SUMMARY OF NONPOINT WATER POLLUTION SOURCES IMPACTING MINNESOTA'S SURFACE WATERS

A. Impaired Surface Waters		
Source	River Miles	Lake Acres
Agricultural Lands	5697	386973
On-Site Wastewater Systems	3555	530480
Urban Lands	3786	383460
Construction Sites	1672	347342
Forest Lands	896	22691
B. Threatened Surface Waters		
Source	River Miles	Lake Acres
Agricultural Lands	4186	631784
Urban Lands	1535	625785
On-Site Wastewater Systems	1518	732748
Construction Sites	865	444022
Forest Lands	361	51669

EROSION & SEDIMENT CONTROLS

REFERENCED IN GREATER MINNESOTA LOCAL WATER PLANS

✓ Considering/Proposing New Ordinances [42]

✓ Proposing Revisions [20]

✓ Existing Ordinances [6]



July 1, 1994

Southbridge Office Building
155 S. Wabasha Street
Suite 104
St. Paul, MN 55107
(612) 296-3767
Fax (612) 297-5615

Field Offices

Northern Region:

394 S. Lake Avenue
Room 403
Duluth, MN 55802
(218) 723-4752
Fax (218) 723-4794

3217 Bemidji Avenue N.
Bemidji, MN 56601
(218) 755-4235
Fax (218) 755-4201

217 S. 7th Street
Suite 202
Brainerd, MN 56401-3660
(218) 828-2383
Fax (218) 828-6036

Southern Region:

P.O. Box 756
Highway 15 S.
New Ulm, MN 56073
(507) 359-6074
Fax (507) 359-6018

1200 S. Broadway
Room 135
Rochester, MN 55904
(507) 285-7458
Fax (507) 280-2875

P.O. Box 267
1400 E. Lyon Street
Marshall, MN 56258
(507) 537-6060
Fax (507) 537-6368

Metro Region:

Southbridge Office Building
155 S. Wabasha Street
Suite 104
St. Paul, MN 55107
(612) 282-5116
Fax (612) 297-5615

TO: Soil Conservation Advisory Committee
Others interested in soil conservation in Minnesota

FROM: David H. Behm, committee facilitator
BWSR Programs & Policy Analyst

RE: Report of the Soil Conservation Advisory Committee

The attached document reflects the culmination of discussions of members of the Soil Conservation Advisory Committee convened by the Minnesota Board of Water and Soil Resources. The committee was initially convened in 1991 to prepare a model ordinance for adoption by counties and townships to address agricultural erosion. The BWSR was prompted to do so because of the numerous references made within county local water plans to either revise existing or adopt new local ordinances to address erosion and sediment control -- many counties have specifically identified agricultural sources as an immediate concern.

The model ordinance will be distributed to all counties, townships, and soil and water conservation districts later this summer.

In 1993, the committee reconvened to review available information regarding the status of erosion in Minnesota. Upon discussing the available information, specific recommendations were presented to the committee for its consideration. Those recommendations are contained within this report. The member organizations and agencies will review this document and individually report back to the BWSR regarding their degree of support for the recommendations contained therein.

During the summer and fall of 1994, the BWSR Board will discuss these recommendations amongst its members and develop a legislative initiative for the FY96-97 biennium. As a reader of this document, you are encouraged to submit written comments or suggestions to me which may assist the Board in its deliberations and preparation of this important legislative package. Please submit your written comments to me at the address listed above. Feel free to call me with any questions you may have; my phone number is 612-296-0880.

Thank you for your interest in sustaining the fundamental natural resources of Minnesota's diverse agricultural productivity: its soils and waters.

An Equal
Opportunity Employer

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*A REPORT OF THE SOIL CONSERVATION ADVISORY COMMITTEE
to the Minnesota Board of Water & Soil Resources*

JULY 1, 1994



The following agencies and organizations participated on the Soil Conservation Advisory Committee. None of the members have endorsed this report or any specific recommendation contained herein.

- *Bret Anderson, Minnesota Department of Natural Resources*
- *Greg Anderson, USDA-Agricultural Stabilization & Conservation Service*
- *C. Merle Anderson, farmer*
- *Wayne Anderson, Minnesota Pollution Control Agency*
- *Julie Bleyhl, Minnesota Farmers Union*
- *Paul Burns and Mark Dittrich, Minnesota Department of Agriculture*
- *John Dooley, Minnesota Association of Townships*
- *Lowell Franzen, Minnesota Association of Conservation District Employees*
- *Rick Hanna, Minnesota Association of County Planning & Zoning Administrators*
- *Owen Knutson, Minnesota Association of Soil & Water Conservation Districts*
- *Roger Mussetter, USDA-Soil Conservation Service*
- *Howard Peterson, Minnesota Association of Watershed Districts*
- *Steve Reckers, Minnesota Planning*
- *Todd Rongstad, Minnesota Farm Bureau Federation*
- *Dave Weirens, Association of Minnesota Counties*

- *David Behm, Minnesota Board of Water & Soil Resources (staff facilitator)*

PREFACE

Maintaining high quality soil is fundamental to sustaining agricultural productivity. Society must continue to reinvest in the land management measures necessary to sustain the soil's productive capacity and overall quality in order to reap the public benefits of a safe and abundant food and fiber supply as well as prevent further degradation of our air and water resources. The reinvestment necessary in agriculture is not unlike similar private and public reinvestment in other industries.

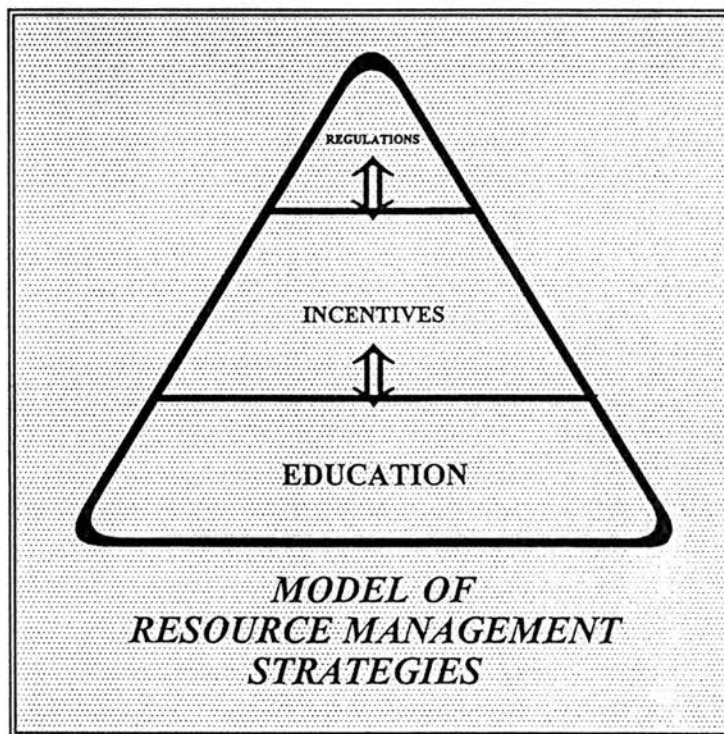
Agricultural producers acknowledge their individual responsibilities to adequately protect the public's interest in soil and water resources for present and future generations. Similarly, the general public acknowledges the inherent and essential need for agricultural producers to have access to the tools and resources necessary to ensure the sustainability of agriculture.

To ensure the economic viability of agriculture while also providing the public goods of water quality protection and sustainability of soil productivity, the Soil Conservation Advisory Committee suggests that a clear restatement of the state's goals for soil protection be made and a balanced approach of resource management strategies (i.e., education-incentives-regulations) be employed in a comprehensive menu of options to address agricultural erosion. The recommendations build upon the voluntary program. The following figure illustrates a conceptual model of an appropriate balance of the recommended initiatives.

In response to many counties identifying the need to revise or adopt ordinances to address erosion and sediment control (especially on agricultural lands), the Minnesota Board of Water and Soil Resources (BWSR) convened an advisory committee in June 1991 to draft a "model" ordinance to assist interested counties. It was the initial intent of the BWSR to then encourage the adoption of the "model ordinance" by all counties, pursuant to their statutory planning and zoning authorities. BWSR staff believe that several counties will likely begin adopting such ordinances in the near future and that some guidance materials relating to existing planning and zoning authorities are needed as soon as possible to assist these counties in their deliberations.

The advisory committee met several times in 1991 and reconvened in 1993 to complete its review of the model ordinance. In late 1993, the BWSR requested the advisory committee to prepare a brief report outlining the fundamental needs of a comprehensive soil conservation program for Minnesota. Based on the recommendations contained in this report, the BWSR will seek a legislative initiative for the FY96-97 biennium to implement an improved and more comprehensive voluntary program to address agricultural erosion.

The BWSR anticipates distributing the model ordinance to all counties, townships and soil and water conservation districts (SWCDs) in the summer of 1994.



EXECUTIVE SUMMARY

Upon review of the information referenced herein or contained in the Appendix of this report, the Advisory Committee finds the following:

- Continuation of current trends of agricultural erosion threaten the long-term productive capability of the soil to provide an abundant food and fiber supply.
- Ample evidence suggests that agricultural erosion and off-site deposition of sediment have impacted (i.e., impaired and threatened) many of Minnesota's surface waters.

Consequently, the Advisory Committee recommends the following:

- An accelerated reduction of agricultural erosion and off-site deposition of sediment and, preferably, an improvement in the overall quality of Minnesota's soil resources must be achieved.
- The federal/state/local/private partnership of delivering soil and water conservation assistance to agricultural producers must be strengthened in the very near future by:
 - (1) accelerating the availability of technical and financial assistance,
 - (2) providing agricultural producers with current soil survey and erosion control information for specific soil types and crops,
 - (3) enhancing statewide resource inventories to ensure that such information is statistically reliable on a countywide and minor watershed basis, and
 - (4) promotion of the adoption of county ordinances to control agricultural erosion.
- Minnesota should establish a "nondegradation" policy for the protection and enhancement of the quality of its soil resources.
- Minnesota should identify the necessary components of a balanced and comprehensive voluntary program and to prescribe a reasonable timeframe for achieving the erosion rate goals identified in *Minnesota Milestones: A Report Card for the Future*.

FINDINGS AND RECOMMENDATIONS

A. Priorities of the State

(1) Soil Conservation for Soil Quality Protection & Improvement

As reported in *Minnesota Milestones: A Report Card for the Future* --

- Statewide average annual soil erosion rates must be reduced so as not to exceed 5 tons per acre per year by the year 2000.

As illustrated in the Appendix to this report, the Advisory Committee found --

- More acres of cropland need erosion control than are adequately protected (refer to "Erosion Control Needs on Minnesota's Cropland: 1967-1987"); and
- Average annual wind erosion on cultivated cropland exceeds the soil's capability to sustain long-term production to produce food and fiber (refer to "Soil Erosion on Minnesota Cultivated Cropland").

Therefore, the Minnesota Board of Water and Soil Resources is advised to:

- Consider legislative amendments to *Minnesota Statutes*, section 103A.209 ("soil and water conservation policy") to add a "nondegradation of soil quality" clause;

- Consider legislative designation of the Lester soil as a state symbol;
- Seek state and matching local funding to prepare updated county-level and minor watershed-level maps of high priority erosion areas; and
- In consultation with the Minnesota Department of Agriculture (MDA) and the U.S. Department of Agriculture-Soil Conservation Service (USDA-SCS), produce maps of highly productive agricultural areas most at risk of suffering reduced soil productivity due to soil erosion rates exceeding soil loss tolerances.

(2) Soil Conservation for Water Quality Protection & Improvement

As reported in *Minnesota Milestones: A Report Card for the Future* --

- 30% of river miles and 19% of lake acres will meet fishable and swimmable water quality standards by the year 2000 -- these will increase to 40% and 29%, respectively, in the year 2010 and to 50% and 39%, respectively, in the year 2020.

As illustrated in the Appendix to this report, the Advisory Committee found --

- Erosion and runoff from agricultural land impairs and threatens a greater number of river miles than any other source of nonpoint water pollution and is also a significant source which impairs or threatens several hundred thousand lake acres (refer to "Summary of Nonpoint Source Water Pollution Sources Impacting Minnesota's Surface Waters").

Therefore, the Minnesota Board of Water and Soil Resources is advised to:

- Encourage local governments to use watershed assessment and planning to develop implementation approaches that address local priority water quality protection and improvement goals;
- Seek state and matching local funding to prepare updated county-level and minor watershed-level maps of high priority sedimentation sources; and
- In cooperation with the USDA-SCS and the Minnesota Pollution Control Agency, establish an auditing process to conduct on-site reviews to determine where best management practices for the control of agricultural erosion and sedimentation are being properly installed/operated/maintained, and whether or not they are effective.

B. Accelerate Availability of Information and Technical Assistance

As illustrated in the Appendix to this report, the Advisory Committee found --

- While SWCD and USDA-SCS staffing levels have remained relatively stable throughout the 1980s, the availability of one-on-one technical assistance to landowners has declined over the last decade (refer to the compendium of staffing level graphs); and
- The state has contributed nearly \$11 million for the preparation of soil surveys, yet not all counties have a published soil survey and those prepared initially are now in need of technical updating to improve their use for land use assessments of soils.

Therefore, the Minnesota Board of Water and Soil Resources is advised to:

- Establish an interagency technical advisory committee to evaluate and retool the delivery of technical assistance from the conservation partnership of federal/state/local agencies;
- Seek state funding to reestablish a soil and water conservation specialist position within the Minnesota Extension Service (MES) of the University of Minnesota (UofM);
- Upon reestablishing the MES/UofM soil and water conservation specialist position, seek state funding to:
 - (a) develop (in cooperation with USDA) a minimum data set of soil quality indicators as suggested by the National Academy of Science, and
 - (b) add regional education specialists (joint appointments with MES and the BWSR) to implement the strategies related to agricultural producers and the control of agricultural erosion, as described in *A Green Print for Minnesota* (state plan for environmental education);
- Seek state funding to ensure county-by-county coverage of soil conservation data items (including soil quality parameters) of high priority to the state for all future National Resources Inventories conducted by USDA-SCS, beginning in 1997;
- Seek state and matching local funding to ensure the availability of soil survey information to all agricultural producers in the state by:
 - (a) preparing soil surveys for all counties,
 - (b) updating existing soil surveys in high priority soil productivity areas, and
 - (c) digitizing soil survey information in high priority soil productivity areas;
- Seek state and matching local funding to employ additional SWCD technicians to provide accelerated availability of one-on-one assistance to landowners necessary to achieve the soil erosion and related water quality goals identified in *Minnesota Milestones: A Report Card for the Future*; and
- Seek state funding to establish a certification/training program for erosion and sediment control specialists from state/local governments and a fee-based certification/training program for private consultants to ensure that the capability of the existing and accelerated technical assistance provided is adequate.

C. Accelerate Availability of Financial Assistance

The Advisory Committee found --

- Since 1978, inflation has reduced the purchasing power of the annual appropriation to the state cost-share program by approximately 50%; and
- Since 1980, Iowa and Missouri have each appropriated *nearly five times more than* the amount of funding appropriated for Minnesota's cost-share program.

Therefore, the Minnesota Board of Water and Soil Resources is advised to:

- Seek additional state funds for the cost-share program authorized by *Minnesota Statutes*, section 103C.501 to:
 - (a) recover inflationary reductions that have occurred since 1978,
 - (b) accelerate the application of best management practices to control agricultural

erosion and sedimentation for the purposes of meeting the anticipated increase in requests for assistance that will be necessary to achieve the soil erosion and related water quality goals identified in *Minnesota Milestones: A Report Card for the Future*;

- In cooperation with MDA and USDA, seek accelerated state funding to convert high priority Conservation Reserve Program contract acres to perpetual RIM Reserve conservation easements;
- Ensure the long-term availability of the new State Revolving Fund loan program to complement other existing and future incentive programs offered to agricultural producers to apply best management practices for the control of agricultural erosion and sedimentation; and
- Seek state funding for a local property tax credit program to encourage agricultural producers to apply best management practices to control agricultural erosion and sedimentation.

D. Accelerate Adoption of Local Official Controls

The Advisory Committee found --

- Forty-two Greater Minnesota counties have indicated in their comprehensive local water plans their intent to consider or propose a new ordinance to address erosion and sediment control;
- Twenty Greater Minnesota counties have indicated in their comprehensive local water plans their intent to propose revisions to existing ordinances which address, at least in part, erosion and sediment control;
- Six Greater Minnesota counties have an ordinance which specifically addresses erosion and sediment control; and
- No Greater Minnesota county or township has adopted an ordinance pursuant to *Minnesota Statutes*, section 103F.401 to 103F.455.

Therefore, the Minnesota Board of Water and Soil Resources is advised to:

- Consider legislative actions to:
 - (a) amend *Minnesota Statutes*, section 103C.405 ("duties of the state board -- program plan") to --
 - (1) identify the components of a comprehensive voluntary program,
 - (2) prescribe a reasonable timeframe for achieving the erosion rate goal identified in *Minnesota Milestones: A Report Card for the Future*, and
 - (b) repeal *Minnesota Statutes*, section 103F.401 to 103F.455;
- In cooperation with USDA and the Minnesota Association of County Planning and Zoning Administrators, assess landowners' compliance with existing federal, state and local regulations addressing agricultural erosion;
- Encourage counties (or townships) to voluntarily adopt the model agricultural erosion control ordinance prepared by the Advisory Committee -- seek state and matching local funding to provide an incentive to do so until the year 2000;
- Seek state and matching local funding to accelerate assistance to counties which have identified in their respective local water plan an intent to revise or develop ordinances

- addressing agricultural erosion;
- Request biennial reports from those state agencies which own or manage agricultural land or that administer programs affecting the management of private agricultural lands regarding the compliance of those lands with the erosion rate goal identified in *Minnesota Milestones: A Report Card for the Future*; and
- Upon receipt of these reports, the BWSR should include an assessment of statewide soil conservation achievements and needs in its biennial report to the Governor (pursuant to *Minnesota Statutes*, section 103B.101, subdivision 9, clause (7)).

Lastly, two organizations represented on the Soil Conservation Advisory Committee raised concerns about the following initiative. This potential initiative was retained in the body of this report because it was discussed by the committee and the Minnesota Board of Water and Soil Resources must further discuss and determine if it will consider incorporating the idea within its legislative initiative for the FY96-97 biennium.

- Consider legislative amendments to *Minnesota Statutes*, section 394.25, to enable counties to assess "excessive erosion fees" to agricultural lands on which average annual erosion rates exceed soil loss tolerances with the fees collected to be used exclusively for local education or incentive programs to encourage agricultural landowners to apply best management practices.

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 - 25) ----. 1971. *Minnesota Soil and Water Conservation Needs Inventory, 1967.* USDA: St. Paul.

APPENDIX

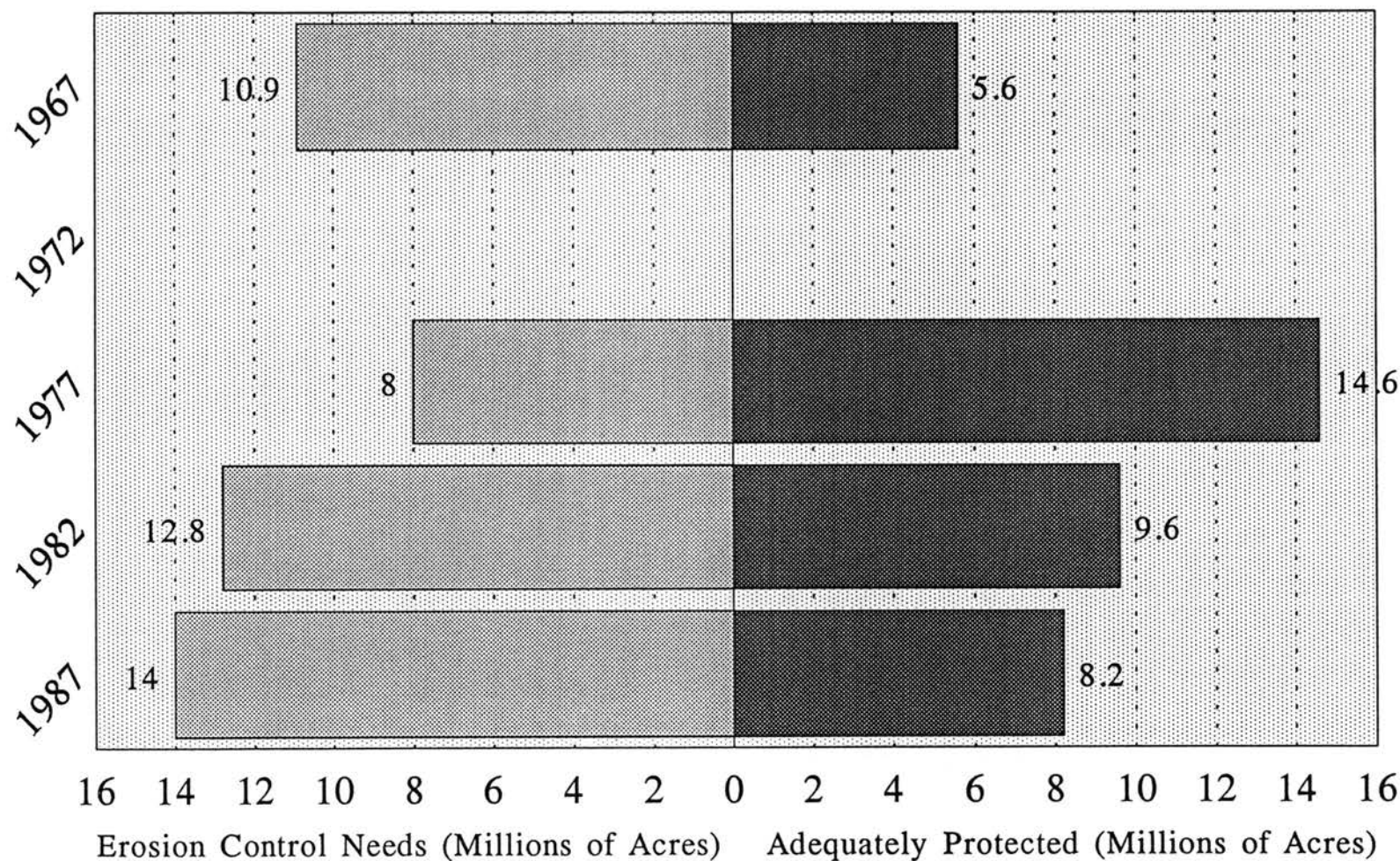
TO THE

REPORT OF THE SOIL CONSERVATION ADVISORY COMMITTEE
to the Minnesota Board of Water & Soil Resources

EROSION CONTROL NEEDS ON MINNESOTA'S CROPLAND:

1967 - 1987

Year



NOTE: Since 1987, nearly 2 million acres have been enrolled in the federal Conservation Reserve Program and approximately 20% of all cropland is under conservation tillage in Minnesota.

SOURCE: USDA-SCS

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Conservation Tillage in Minnesota, 1987-1993
(All Crops)

YEAR	TOTAL PLANTED (acres)	NO-TILL (acres) [% of total planted]	RIDGE- TILL (acres) [% of total planted]	MULCH- TILL (acres) [% of total planted]	TOTALS (acres) [% of total planted] {U.S. rank}
1993	17,737,678	809,306 [5]	569,097 [3]	3,449,875 [19]	4,828,278 [27] {N/A}
1992	18,297,222	531,027 [3]	572,799 [3]	2,971,651 [16]	4,075,477 [22] {10}
1991	18,190,002	309,994 [2]	559,903 [3]	2,699,398 [15]	3,569,295 [20] { 8}
1990	18,258,603	230,100 [1]	535,904 [3]	2,597,012 [14]	3,363,016 [18] { 8}
1989	18,105,232	188,944 [1]	478,247 [3]	2,533,506 [14]	3,200,697* [18] { 9}
1988	17,410,093	164,953 [<1]	460,184 [3]	3,653,217 [21]	4,352,324* [25] { 6}
1987	22,990,000	20,600 [<1]	149,200 [<1]	2,068,800 [12]	2,701,100* [12] {N/A}
AVERAGE [%]	18,712,690	322,132 [2]	475,048 [3]	2,853,351 [15]	3,727,170* [20]

*Total also includes those crop acres under "strip tillage."

SOURCES:

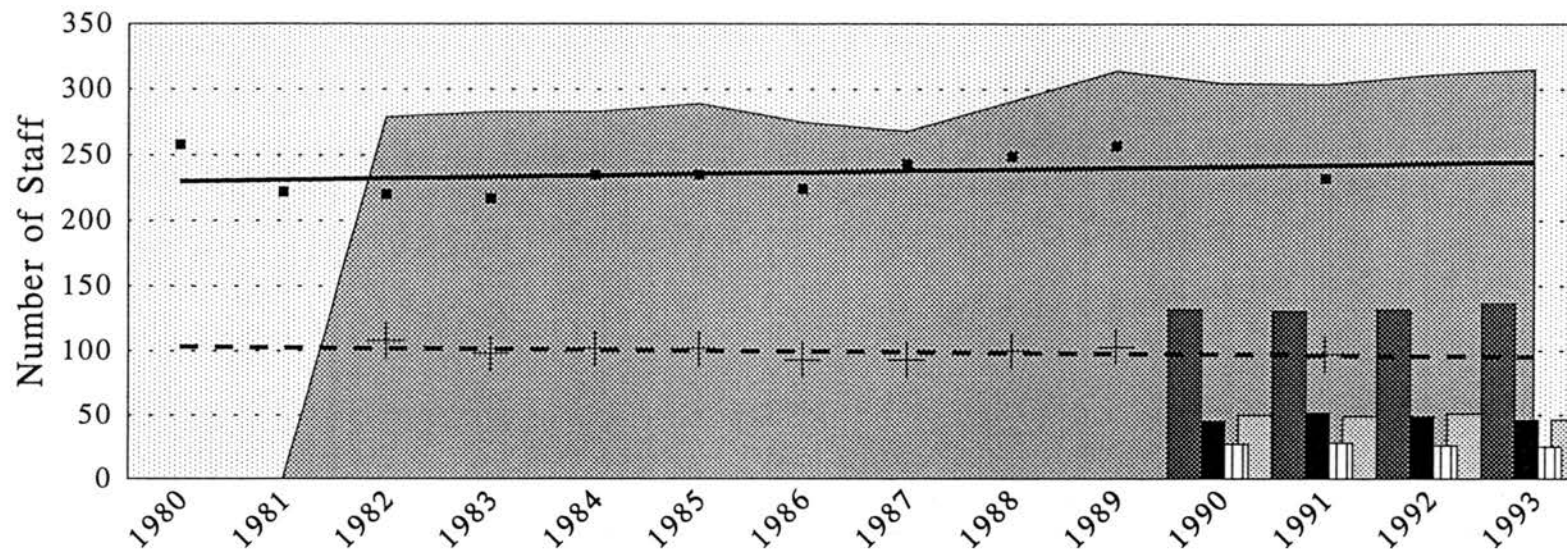
Conservation Tillage Information Center

1987 National Resources Inventory, Soil Conservation Service

Staffing Levels:

Soil Conservation Service and Soil & Water Conservation Districts

1982 - 1993



SCS Technicians	N/A										50	49	51	46
SCS Engineers											27	28	26	25
SCS Soil Scientists											45	52	49	46
SCS Soil Conserv'ists											132	131	132	137
SCS Total Staff			279	283	283	289	275	268	291	314	305	304	311	315
SWCD Technicians			108	98	102	102	93	93	100	103	N/A	97.5	N/A	N/A
SWCD Total Staff	258	222	220	217	235	235	224	243	249	257		232.25		

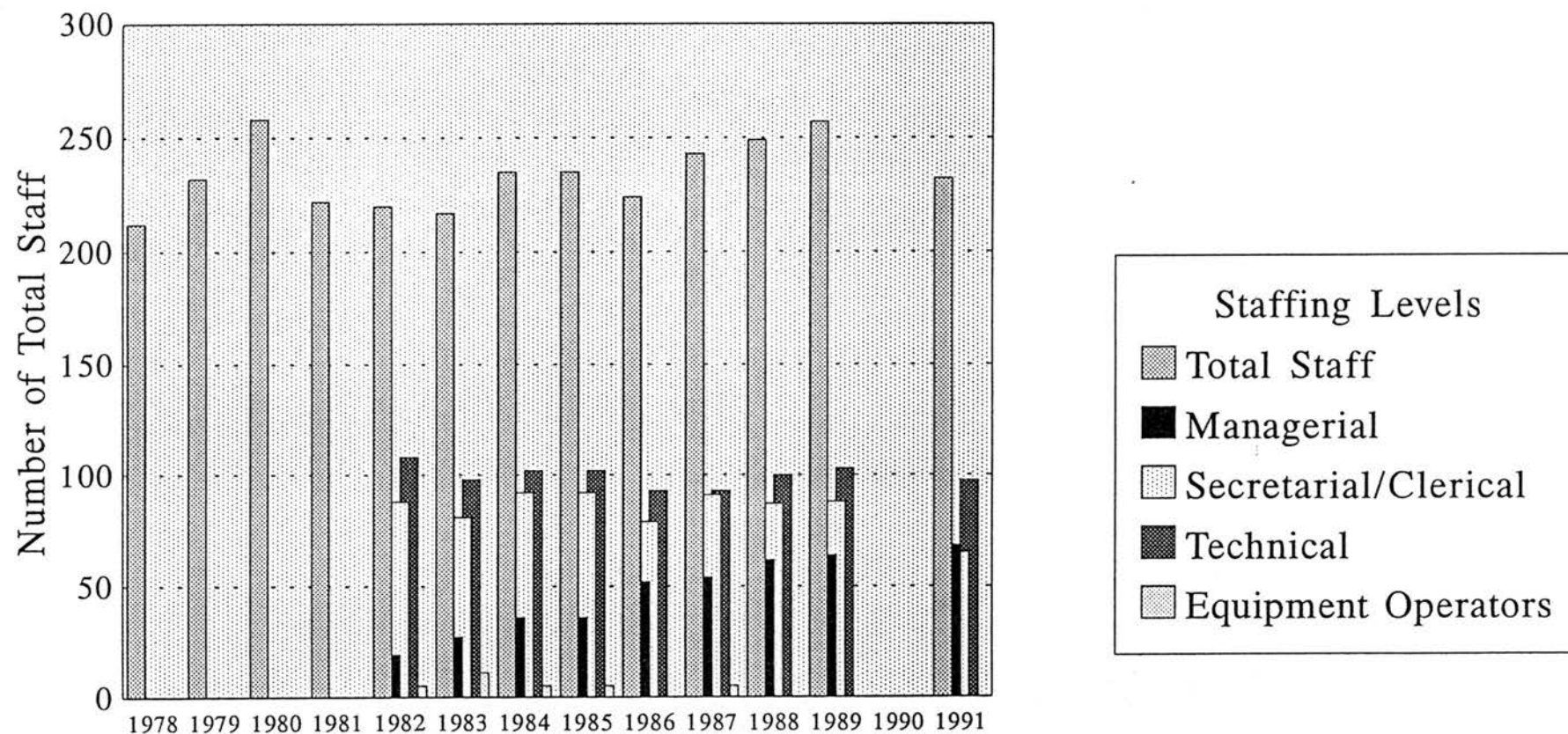
Years

Type of Staff

SWCD Total Staff
 SWCD Technicians
 SCS Total Staff
 SCS Soil Conserv'ists
 SCS Soil Scientists
 SCS Engineers
 SCS Technicians

N/A = Not Available

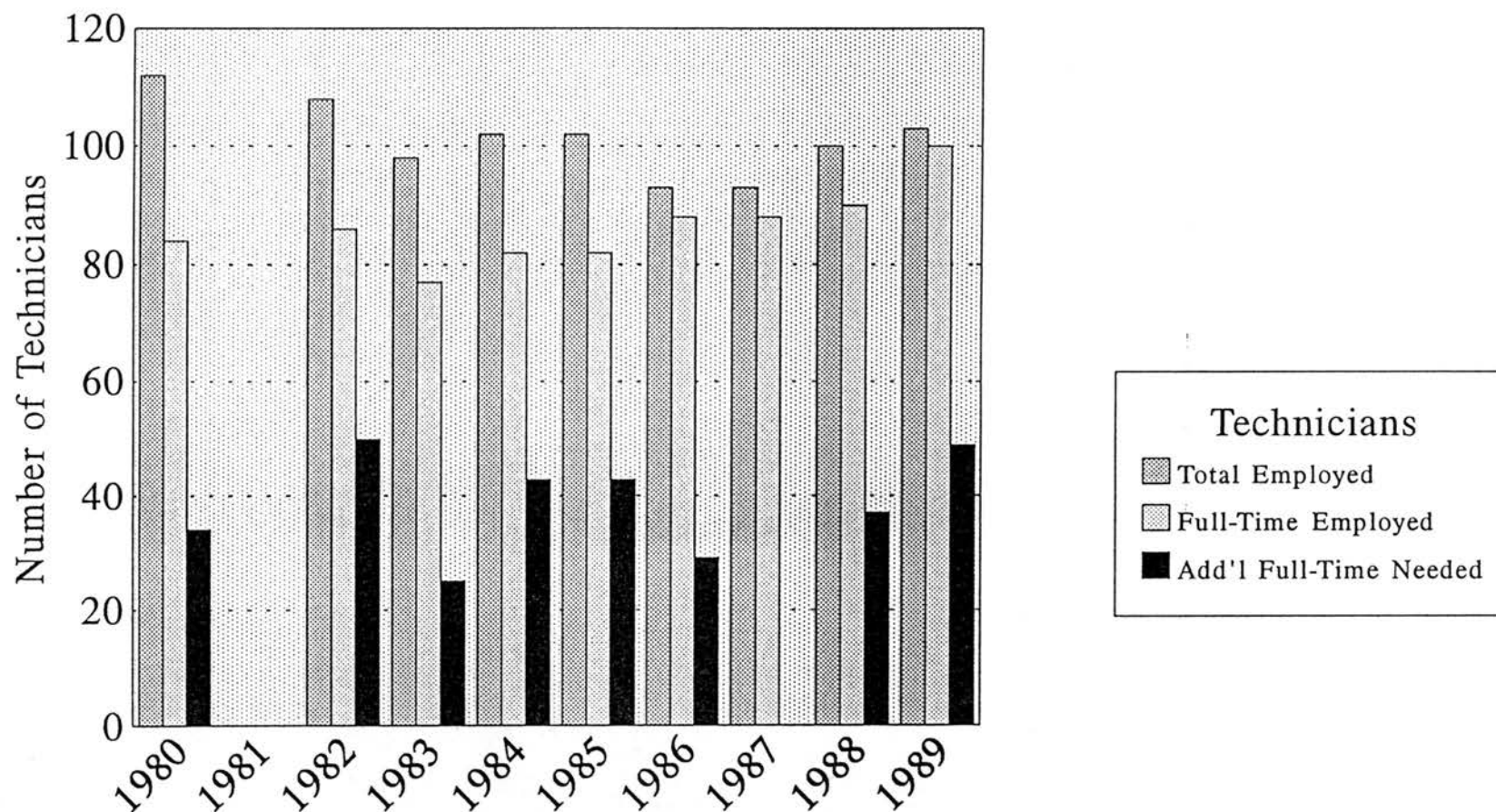
STAFFING LEVELS OF SOIL & WATER CONSERVATION DISTRICTS: 1978 - 1991



Total Staff	212	232	258	222	220	217	235	235	224	243	249	257	N/A	232.25
Managerial	N/A				19	27	36	36	52	54	62	64	N/A	68.5
Secretarial/Clerical					88	81	92	92	79	91	87	88		65.25
Technical					108	98	102	102	93	93	100	103		97.5
Equipment Operators					5	11	5	5	0	5	0	0		0

Years

TECHNICIANS EMPLOYED AND NEEDED BY SOIL & WATER CONSERVATION DISTRICTS: 1980 - 1989



Total Employed	112	N/A	108	98	102	102	93	93	100	103
Full-Time Employed	84	↓	86	77	82	82	88	88	90	100
Add'l Full-Time Needed	34	↓	50	25	43	43	29	N/A	37	49

Years

N/A = Not Available

SOIL & WATER CONSERVATION DISTRICT

Expenditures on Personal Services:

1984 - 1993

<i>Years</i>	<i>Total Expenditures: Personal Services</i>	<i>Total Staff</i>	<i>Cost per Staff</i>
1984	3,595,000	235	15,298
1985	3,766,000	235	16,026
1986	3,984,000	224	17,786
1987	4,599,000	243	18,926
1988	5,506,000	249	22,112
1989	6,054,000	257	23,556
1990	6,573,000	*	*
1991	7,083,000	232.25	30,497
1992	7,729,000	*	*
1993	8,187,000	252	32,488

* = Not Available

SOIL & WATER CONSERVATION DISTRICT

Expenditures on Personal Services:

1984 - 1993

- ▶ Soil and water conservation districts have increased their expenditures on personal services, yet overall staffing levels have remained relatively flat over the past 10-year period. There are several reasonable explanations for this apparent discrepancy between the relationship of the growth of expenditures and staffing levels. They are as follows:
- ▶ Double-digit inflation occurred during much of the mid- to late-1980s, which was largely responsible for the significant increase in overall personal services expenditures.
- ▶ Beginning in the late 1970s and early 1980s, soil and water conservation districts across the state began to increase the number of their employees to meet increasing demands from local landowners to apply soil and water conservation practices to control erosion and protect water quality. These entered the profession at relatively low wages, many without fringe benefits.
- ▶ Many of the employees hired in the late 1970s and early 1980s were retained by their respective SWCDs for many years. Consequently, these employees gained seniority within their positions which resulted in increased wages over time. Now, these employees are at or near the top of their respective paycales.
- ▶ Beginning in the mid-1980s, many SWCDs began to add employee benefit programs in efforts to retain these dedicated employees. Also, most SWCDs recognized the findings of comparable worth studies and incorporated paycale adjustments accordingly. These adjustments resulted in greater expenditures for personal services.
- ▶ Most SWCDs now have a manager directing the daily activities and programs of the district. These individuals are compensated at the highest paycale levels.
- ▶ Cumulatively, these actions are responsible for the significant increase in personal service expenditures by SWCDs and also explains why there has been no comparable increase in overall levels. It is also noteworthy to mention that as SWCDs have promoted from within, many of the technicians who previously provided one-on-one technical assistance to landowners are now less available to meet these requests. Consequently, as the SWCDs have increased their capacity to accept the delegation of many state (and federal) programs since 1984, their overall capacity to provide one-on-one technical assistance to their constituents has actually been reduced.

Soil Conservation Advisory Committee Recommendations: **JULY 1994**
New or Accelerated Appropriations

NOTES:

- 1) *The items are listed according to the priorities as recommended by the BWSR Strategic Soil Loss Committee.*
- 2) *The "excessive erosion fee" is not listed below.*
- 3) *The BWSR Strategic Soil Loss Committee also recommends reestablishing the MES/UofM windbreak specialist position (not listed below or in the Soil Conservation Advisory Committee report).*

PRIORITY 1:

- Development of soil quality indicators
(as recommended by the National Academy of Sciences) \$?
- County-level NRI data in 1997 and every 5 years thereafter \$?
- Soils information:
[estimate represents state share, but would require matching amount of local funds]
[assume annual appropriation @ \$ 1,000,000 for 5 years] \$ 5,395,000
 - (a) soil survey completion or remap = 11 counties
 - (b) update & recompile older soil surveys = 55 counties
 - (c) digitize soil surveys = 13 counties
(including all of the above counties; 79 counties total)
- Convert high priority CRP & 10-year RIM Reserve parcels to perpetual RIM Reserve easements \$ 5,816,000

PRIORITY 2:

- MES/UofM soil and water conservation specialist \$?

*Priority 2
Forestry - windbreaks u of m*

Soil Conservation Advisory Committee Recommendations: **JULY 1994**
New or Accelerated Appropriations (continued)

PRIORITY 3:

- High priority maps (erosion, sedimentation) at county- and minor watershed-levels:
 [state plus matching local funds] \$?
- MES/BWSR regional soil & water conservation education specialists
 (7 @ \$70,000 each) [annual appropriation] \$ 490,000
- Acceleration of SWCD technical assistance (49 technicians @ \$40,000 each)
 [state plus matching local funds; annual appropriation] \$ 980,000
- Certification/training program \$?
- Acceleration of state cost-share program
 {recover inflationary losses since 1978 (\$0.75 million) plus overall acceleration (\$3 million)}
 [additional annual appropriation] \$ 3,750,000

PRIORITY 4:

- Grants to Greater MN counties to adopt "model agricultural erosion ordinance" {60 counties @ \$15,000 each}
 [state plus matching local funds; annual appropriation through 2000] \$ 900,000
- Local conservation credit program (property tax credits) \$?

GRAND TOTALS:

- | | | |
|--|-----------------------------------|---------------------------------|
| (a) permanent annual funding: | STATE = \$ 5,220,000 ⁺ | LOCAL = \$ 980,000 ⁺ |
| (b) additional annual funding through the year 2000: | STATE = \$ 1,900,000 | LOCAL = \$ 1,900,000 |
| (c) additional funding in 1997 (and every five years thereafter) | STATE = \$? | LOCAL = N/A |
| (d) additional one-time funding | STATE = \$ 5,816,000 | LOCAL = N/A |

Soil Conservation Advisory Committee Recommendations:
New or Accelerated Appropriations (continued)

JULY 1994

POTENTIAL FUNDING SOURCES:

NOTE: Excessive erosion fees and the MES/UofM windbreak specialist position are NOT included in this list.

Source:

Items:

General fund

- MES/UofM soil and water conservation specialist
- MES/BWSR regional soil and water conservation education specialists
- SWCD technicians
- certification program
- cost-share program
- model ordinance grants to counties
- local conservation credit program

Environmental/Future Resources Trust Funds

- high priority maps
- soil quality indicators
- NRI data, beginning in 1997
- soils information
- convert high priority CRP parcels to RIM Reserve
- model ordinance grants to counties

Local property tax

- high priority maps
- soils information
- SWCD technicians
- model ordinance grants to counties
- local conservation credit program

State (and local?) sales tax

- cost-share program

Fees (registration fees)

- certification/training program

Soil Conservation Advisory Committee Recommendations: **JULY 1994**
Policy and Administrative Initiatives

NOTE: *The BWSR Strategic Soil Loss Committee did not prioritize these recommendations.*

- Add "Nondegradation of soil quality" clause to statutory "soil and water conservation policy"
- Designation of Lester soil as a state symbol
- Encourage local governments to use watershed assessment and planning to develop implementation approaches that address local priority water quality protection and improvement goals
- Establish auditing process to conduct on-site reviews to determine where best management practices for the control of agricultural erosion and sedimentation are being properly installed, operated, and maintained and whether or not they are effective
- Establish interagency technical advisory committee to evaluate and retool the delivery of technical assistance from the conservation partnership of federal/state/local agencies
- Ensure long-term availability of new State Revolving Fund loan program to complement other existing and future incentive programs offered to agricultural producers to apply best management practices for the control of agricultural erosion and sedimentation
- Amend statutory "duties of state board -- program plan" to:
 - (1) identify the components of a comprehensive voluntary program, and
 - (2) prescribe a reasonable timeframe for achieving the erosion rate goal identified in *Minnesota Milestones: A Report Card for the Future*
- Repeal "excessive soil loss" statutes
- Inventory landowners' compliance with existing federal, state, and local regulations addressing agricultural erosion
- Request biennial reports from those state agencies which own or manage agricultural land or that administer programs affecting the management of private agricultural lands regarding the compliance of those lands with the erosion rate goal identified in *Minnesota Milestones: A Report Card for the Future*
- Upon receipt of these reports, the BWSR should include an assessment of statewide soil conservation achievements and needs in its biennial report to the Governor



Minnesota Farm Bureau Federation

1976 Wooddale Drive, P.O. Box 64370, St. Paul, MN 55164-0370
Phone (612) 739-7200 Fax (612) 739-5381

June 23, 1994

David H. Behm
Minnesota Board of Water & Soil Resources
155 S. Wabasha Street, Suite 104
St. Paul, MN 55107

Dear Dave:

Thank you for taking the time last week to come out to our office to discuss the peer review draft of your soil conservation proposal. It was a a productive discussion, and we look forward to continuing to work together as consideration of this important issue continues.

The Minnesota Farm Bureau obviously shares your commitment to the development of new policies to address the state's soil erosion problems. The recommendations for additional cost-share funding and technical assistance are long-overdue and will certainly receive our wholehearted support.

As the three of us related, however, our members have some serious reservations about this preliminary draft. In our view, the establishment of an "excessive erosion fee" or "soil erosion surcharge" conflicts with the advisory committee's oft-stated plan to develop a more effective, voluntary erosion control program. In addition, the tone and standards articulated in these BWSR recommendations could result in farmers becoming more of a target than a partner in the process.

Although our policy directly opposes this type of punitive program, be assured that your suggestions will serve as a starting-point for our members' 1994 policy development debate. This grassroots consideration should help us identify a more farmer-friendly manner to achieve the results we all desire.

As we discussed, it would be appropriate to list MFBF as an advisory committee participant if you explain that we do not endorse the report or its recommendations.

Thank you again for seeking our input.

Sincerely,

Todd J. Rongstad