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Minnesota Board of Water and Soil Resources. Minutes.

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BOARD OF WATER AND SOIL RESOURCES
KELLY INN
161 ST. ANTHONY STREET
ST. PAUL, MINNESOTA
APRIL 28, 1993

APPOINTED MEMBERS PRESENT
Jim Nielsen, Jim Rossman, Don Ogaard, Dwain Otte, Sharon Clark, Ted Lovdahl, Barbara Uppgaard, Barbara Cobb, Kathleen Roer, Warren Rodning, Howard Peterson, and John Boulton.

AGENCY MEMBERS PRESENT
Wayne Edgerton, Department of Natural Resources (DNR)
Wayne Anderson, Pollution Control Agency (PCA)
Elton Redalen and Paul Burns, Department of Agriculture (MDA)
Fred Bergsrud, U of M/Extension Services (MES)
Kim Benson-Johnson, Department of Health (MDH)

OTHERS PRESENT
D'Wayne DeZiel and Bob Pigeon, Minnesota Association of Soil & Water Conservation Districts (MASWCD)
Pat Wulff, Minnesota Lakes Association (MLA)
Curt Borchert, Minnesota Association of Conservation District Employees (MACDE)
Eugene Kalmes and Shelly Eckblad, Whitewater Project
Tim Koehler, Soil Conservation Service (SCS)

STAFF PRESENT
Ron Harnack
Jim Birkholz
Doug Thomas
Pete Waller
Jim Haertel
Barbara Cobb
Susan Tsakakis
Al Kean
Dave Behm
Chuck Niska
Mary Jo Anderson

Meeting Called to Order - Chairman Nielsen called the meeting to order at 9:00 a.m.

** 93-14 **Adopt Agenda** - Moved by Rossman, seconded by Cobb, to adopt the agenda as presented. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-15 **Minutes of March 24, 1993** - Howard Peterson stated that Al Dornfeld's name needs to be added to the attendance roster on page one of the minutes. Moved by Rossman, seconded by Roer, to approve the minutes of March 24, 1993, as circulated. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Chairman's Report - Chairman Nielsen reported that agency heads of the MDA, DNR, and PCA met yesterday regarding feedlot issues. Chairman Nielsen stated that the feedlot issue is being stonewalled. Wayne Anderson, PCA, asked Chairman Nielsen to clarify his comment. Chairman Nielsen responded that an open dialogue is a stonewalling tactic by PCA. Ron Harnack responded that there are ongoing meetings being held regarding feedlot issues, permitting, enforcement, etc., and there is progress being made. Wayne Edgerton stated that a list of feedlot violators has been compiled; those violators are under investigation by the Attorney General's Office, and the list is kept confidential. Chairman Nielsen stated that agencies should be in a position to work cooperatively on this issue; why make criminals out of feedlot violators.

Chairman Nielsen stated that BWSR hasn't played a big part in the Sustainable Development Process. D'Wayne DeZiel stated that he would like to see the BWSR at those meetings. Chairman Nielsen said that staff have been assigned to task forces including the Sustainable Ag Task Force, and if any members are interested in this they should contact Jim Nielsen or Ron Harnack. Barbara Uppgaard said that BWSR should state where they fit in rather than wait to hear from them; BWSR needs to be proactive. May 10 is the next meeting date of the Sustainable Ag Task Force.

Executive Director's Report - Ron Harnack stated that the Board Member Update has been distributed for members information. He gave a brief budget update on the Minnesota River initiative in RIM. The Senate reduced the wetlands budget by $500,000 per year. The budget looks pretty good in the House.

Ron updated the BWSR on Legislative issues. The wetlands bill is still going through on the floor. Ron foresees the legislature adjourning by May 10.

Don Ogaard briefly reported on the BWSR's Soil Loss Committee. The committee met last night and discussed the model ordinance. The committee will resume meeting with agency

committees. Their next meeting is scheduled for May 28.

Richfield/Bloomington WMO Boundary Change - Jim Haertel met with the Dispute Resolution Committee (DRC) and approved the facts, findings, and conclusion of the Richfield/Bloomington WMO boundary change; the DRC recommends approval of the boundary change. Moved by Peterson, seconded by Lovdahl, to accept the DRC's recommendation to approve the Richfield/Bloomington WMO boundary change. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-16

Howard Peterson summarized the Rice Creek Watershed District issue. Rice Creek ordered a project hearing and Fridley will, without prejudice, withdraw their appeal.

Snake River Joint Powers Agreement (JPA) - Doug Thomas reported that staff attended a Snake River JPA meeting on April 8, 1993. The purpose of the meeting was to present recommended changes to the agreement based on board member input since the March 24, 1993, BWSR meeting. The JPA members accepted changes recommended. Doug Thomas recommended approval of the JPA. Moved by Cobb, seconded by Uppgaard, that the BWSR accept the JPA as adequate and instruct staff to work with the petitioners to withdraw the petition for establishment of the Snake River Watershed District; and direct staff to establish an annual review of the Snake River Joint Powers Board, with the first report to be done in January of 1994. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed. None. Carried. Dwain Otte suggested that staff report to the BWSR in October on how this is progressing rather than wait until the first review in January. Staff was directed to do so. Cobb commended Doug Thomas and everyone who has been involved in the situation, for their time and efforts in developing an excellent joint powers agreement.

** 93-17

Assignment of Lands/Areas to Specific Water Planning Entities - Jim Haertel explained that the Metropolitan Watershed Management Act (Act) was amended in 1990 to require watershed management plans for areas that were formerly exempt from planning in the seven-county metro area (M.S. 103B.205 to 103B.255). A policy determination should be made on whether a few small metro areas on the fringe of the seven-county metro area should be allowed to meet the watershed management planning requirement by being included in an adjacent non-metro county's local water plan (LWP) or be required to plan under the Metro Act. The areas of concern are the cities of Rockford and Hanover; a large portion of each city is in Wright County and a small portion is in Hennepin County. The areas of each city in Wright County are in the Wright County local water plan. Rockford and Hanover desire to include their entire city in the Wright County local water plan. If not allowed, other options would be for each city to prepare a plan under the Act for at

least the area of Hennepin County, or join a neighboring water management organization or watershed district. Jim stated that staff has been in consultation with Bill Clapp, special assistant attorney general, on this issue, and it's their opinion that the BWSR make the policy determination. The staff recommendation is to allow watershed management planning in these small metro fringe areas under the adjacent county's local water plan, the cities of Rockford and Hanover to remain in the Wright County local water plan. Moved by Otte, seconded by Roer, to accept the staff recommendation to allow Rockford and Hanover to remain in the Wright County local water plan. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-18

Chairman Nielsen called for a break in the meeting at 9:55 p.m. The meeting reconvened at 10:15 a.m.

Whitewater Watershed Project - Ron Harnack introduced Eugene Kalmes and Shelly Eckblad, Whitewater Project representatives, and Tim Koehler, SCS. Eugene reported that the Whitewater Project started in 1987. Shelly explained that the Whitewater Project is in Olmsted, Wabasha, and Winona Counties, and membership of the project board includes three county commissioners and three SWCD supervisors. Tim distributed an SCS reference document, "Water Resources Projects Status Report," for the Board's information. They are asking the BWSR to consider Four Watershed Units as a high priority with intent to work with the Joint Powers Board. Tim explained that they are not asking the BWSR for anything different from their original request. Discussion followed. Moved by Rossman, seconded by Otte, that the BWSR approve the PL566 applications for the Whitewater Watershed Project (four subwatersheds) as a high priority. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-19

Chairman Nielsen introduced Dick Jackson, Mille Lacs County commissioner, who just arrived. Mr. Jackson thanked the BWSR for their approval of the Snake River Joint Powers Agreement.

Soil Conservation Service (SCS) Report - Tim Koehler explained that Gary Nordstrom is in Kansas City today for a meeting. Tim reported that the administrative proposal for the 1994 budget was sent to Washington, D.C., for Congress to consider.

Tim stated that there's a proposal to restructure three agencies, SCS, Farmers Home Administration (FmHA), and the Agricultural Stabilization and Conservation Service (ASCS) and combine them into one, the Farm Services Agency. Tim reported that a decision has not yet been made regarding Senator Madigan's proposal to close offices.

Ron Harnack suggested that the BWSR send a letter to the Minnesota congressional delegation regarding the "Farm Services Agency" - restructuring of the U.S. Department of Agriculture. Chairman Nielsen suggested that a presentation by SCS, ASCS, FmHA and staff of the congressional delegation be made at the May meeting regarding this issue. Ron reported that Wally Sparby has been appointed as the new chief of ASCS.

Don Ogaard reported that he will give a slide presentation at the May meeting regarding Red River projects and the Red River Watershed District's annual report.

Chairman Nielsen introduced representatives of the Lake Association, Donna Strusinski, Clare Frebo and Lloyd Marier; and commended them for their diligence. They briefly commented on their appreciation of the BWSR's action today regarding the Snake River Joint Powers Agreement.

Feedlot Cost-Share Policy Relating to Enforcement Actions - Jim Rossman explained that the BWSR had requested the Feedlot Committee to review options to allow cost-share for feedlots when enforcement action had been taken by DNR or PCA. Five options were reviewed and the committee preferred Option #5. Barbara Cobb asked Wayne Anderson, PCA, what his thoughts were on Option #5. He stated that it's adequate and he's willing to see it work. Paul Burns, MDA, thinks Option #5 is consistent with Commissioner Elton Redalen's perspective and that it send a strong signal. Discussion followed. The committee agreed to add the word "formal" to enforcement in the last paragraph, and to change the word "landowner" to "feedlot owner." Moved by Rossman, seconded by Lovdahl, to adopt Option #5 of the Feedlot Cost-Share Policy Relating to Enforcement Actions as follows:

** 93-20

WHEREAS, the State of Minnesota has made available, through the Cost-Share Program administered by the Board of Water and Soil Resources, funding for the purpose of sharing in the costs of installing manure management systems which will prevent or minimize the degradation of water and soil resources and protect the public health; and

WHEREAS, feedlot owners or operators participating in the Cost-Share Program are expected to act in good faith to comply with all applicable state and local government resource protection rules and ordinances; and

WHEREAS, the current Cost-Share Program rules are silent regarding the eligibility of feedlot owners or operators who knowingly violate these rules and ordinances.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with soil and water conservation districts, counties and appropriate state agencies to determine the eligibility of feedlot owners or operators for Cost-Share Program funding of manure management systems on a case-by-case basis where formal enforcement actions have been taken,

considering the environmental and legal facts of the situation, as well as the feedlot owner's demonstration of good faith.

Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Future Meetings - Ron Harnack stated that members need to look at upcoming BWSR meeting dates and schedule accordingly. It was decided to meet on the following dates: May 26; June 25-26 in conjunction with MAWD meeting and tour; no meeting in July; August 25; September 22 meeting and tour in Itasca County; October 27; combine the November/December meeting and meet December 8.

Advisor Comments

-Minnesota Association of Soil and Water Conservation Districts (MASWCD): D'Wayne DeZiel reported that the National Association of Conservation Districts (NACD) will hold their North Central Leadership Session in Duluth, July 11-14, 1993. The NACD North Central Urban Symposium is scheduled for November 7-10 in Minneapolis. D'Wayne stated that MASWCD has been spending a lot of time on the SCS restructuring issue.

-Minnesota Association of Conservation District Employees (MACDE): Curt Borchert, the district manager in Norman County SWCD, reported that he had been appointed as a director of MACDE. Curt will be attending BWSR meetings.

-Minnesota Lake Association (MLA): Pat Wulff thanked BWSR for their contribution to the MLA for their fall conference. MLA has recently received a grant for $51,000 over a two-year period from the Environmental Protection Agency (EPA). Pat reported that MLA is taking part in the MES Master Gardener Program; this is a good working experience with MES.

-Minnesota Association of Watershed Districts (MAWD): Howard Peterson reported that the MAWD meeting and tour materials for their summer tour will be distributed soon -- dress comfortably for the tour. Howard recognized the Minneapolis "Star and Tribune" for their article on rule writing.

Chairman Nielsen adjourned the meeting for lunch at 11:55 a.m. The meeting reconvened at 1:00 p.m.

Jim Birkholz will be sitting in for Ron Harnack this afternoon, as Ron will be at the Capitol. Don Ogaard had another meeting to attend so he will be out this afternoon. Kim Benson-Johnson, MDH, entered the meeting at 1:10 p.m.

Tim Gramm Conservation Easement - Al Kean explained that two years ago the Department of Agriculture released sale of land to Tim Gramm with a conservation easement relating to highly erodible land. Tim Gramm has requested release from the easement. BWSR staff, MDA staff, Attorney General's Office, and Senator Charlie Berg have met with Tim Gramm to discuss this issue. During this meeting, there was general support for a conditional release from the easement. Wayne Edgerton, DNR, stated that questions and concerns regarding the easement pertain to the RIM rules. Paul Burns, MDA, responded that enforcement of the easement is not up to MDA. Discussion followed. Jim Birkholz stated that staff and the Attorney General's Office will look into this, whether or not the BWSR has the authority or who is responsible for this. Elton Redalen suggested delaying action on this until further information is obtained. Chairman Nielsen directed staff to assist Mr. Gramm where possible. Chairman Nielsen asked what jurisdiction does the BWSR have, is it possible to develop a substitute plan for the easement, and what are the penalties involved? Moved by Lovdahl, seconded by Rodning, that staff directed to research and find answers to: 1) what jurisdiction does BWSR have? 2) is it possible to develop a substitute plan for the easement? and 3) what are the penalties involved? regarding the Tim Gramm easement. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried. Jim Rossman stated that Mr. Gramm needs to be notified that cropping that easement is not a good idea.

** 93-21

** 93-22 Moved by Otte, seconded by Clark, that staff directed to investigate M.S. 103F.535 - are they under jurisdiction rule? Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Continuation of the BWSR/MES Education Position and Partnership - Sharon Clark distributed a letter she planned to send to Senator Lawrence Pogemiller regarding the BWSR's support for continued funding of the environmental education effort. Fred Bergsrud, MES, stated that Barbara Liukkonen's position has been very beneficial and Dr. Pat Borich has also been very positive regarding this position. Susan Tsakakis gave background information, and reported on the activities that Barb has been involved in the past six months. The BWSR Education Committee's recommendation is to extend the position for the biennium. Pat Wulff commended Barbara's work and said she appreciated the BMP sheets Barbara had developed and stated how helpful the sheets are to realtors and lake associations. Chairman Nielsen suggested that the efforts of BWSR be heightened; and we should take more credit for what we're doing. Moved by Clark, seconded by Lovdahl, to continue the BWSR/MES education position for the upcoming fiscal year 1994-1995 biennium. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried. Sharon Clark proposed an education position in southern Minnesota. Fred Bergsrud explained that MES has a water quality position in southeastern Minnesota. He stated that possibly BWSR and MES could

** 93-23

jointly go to the Legislature for funding additional positions, including a third position in the metro area. A meeting has been scheduled for May 25 to discuss this issue further. Jim Rossman stated that he endorses this proposal. Chairman Nielsen thanked the Education Committee for their efforts, and especially appreciated the exemplary, highly motivated, excellent report made by Susan Tsakakis!

Local Water Planning Challenge Grants - Chuck Niska summarized the Local Water Resources Protection and Management Program and also gave a brief synopsis of the local water planning challenge grant proposal. Chuck stated that approval is needed to make the grants; the grant agreements are available to send out now with funding to be sent out in two to three months. Discussion followed. Moved by Rodning, seconded by Boulton, to approve the staff recommendation for disbursement of the Local Water Resources Protection and Management Program challenge grant requests. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-24

Chairman Nielsen announced that Chuck Niska is leaving BWSR, effective today, and going to DNR to work with their federal grant program. Dwain Otte expressed his appreciation for Chuck's assistance at BWSR. Chairman Nielsen asked Chuck to leave a note to his successor to tell members what the criteria is for the programs and also a justification for each project.

Cost-Share Program Allocation Process/Request for Change - Dave Behm explained the need for revision of the Cost-Share Program rules. Staff asked for BWSR endorsement and will come before the BWSR again at the May meeting with greater detail. Chairman Nielsen suggested that staff prepare a summary of the current rules showing an abstract comparison of the changes to be made and to present this information at the May or June meeting.

Chairman Nielsen commended Dave Behm for his attendance at the meetings with Elton Redalen.

Fred Bergsrud distributed copies of the publication "Clean Water" for the BWSR's information.

Chairman Nielsen distributed copies of the "Kiplinger Agriculture Letter" for members information.

** 93-25 Moved by Boulton, seconded by Peterson, to adjourn the meeting at 2:50 p.m. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Respectfully submitted,

D. James Nielsen
Chairman

A

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M E M O R A N D U M

April 5, 1993

TO: Dispute Resolution Committee
Howard Peterson, Chair
Jim Nielsen
Jim Rossman
Kathleen Roer
Ted Lovdahl

FR: ~~Jim~~ Jim Haertel, Board Conservationist

PH: (612) 297-2906

RE: CITY OF RICHFIELD PETITION - BOUNDARY CHANGE

After the meeting today I redrafted the hearing minutes from January 26 and the Findings, Conclusions and Recommendations. However, the hearing minutes from March 23 have NOT been redrafted since the person who typed them is on vacation this week.

Please find enclosed the redrafted items mentioned above plus the minutes from today's meeting. I have annotated all the changes made subsequent to today's meeting. Also enclosed is a copy of the March 23 hearing minutes with the changes annotated.

I will make sure Howard receives final copies of all of these items including the draft Order, whether ultimately changed from what you are receiving now or not, before the beginning of the Board meeting on April 28.

Additionally, I have requested copies of the approved minutes from Minnehaha Creek Watershed District and Nine Mile Creek Watershed District as we discussed.

Please contact me with any corrections, comments or questions.

Enclosures

c: Bruce Sandstrom
Bill Clapp

Minnesota Board of Water and Soil Resources
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In the Matter of the review of the **City of Richfield Petition for a Boundary Change** relating to Minnehaha Creek Watershed District, Nine Mile Creek Watershed District and Richfield-Bloomington Watershed Management Organization pursuant to Minnesota Statutes Section 103D.251.

Whereas, the Board of Water and Soil Resources (Board) received a petition from the City of Richfield dated December 7, 1992 that requests changes to the boundaries of the Minnehaha Creek and Nine Mile Creek Watershed Districts that would effectively transfer approximately 1225 acres and 173 acres, respectively, from said Districts to the Richfield-Bloomington Watershed Management Organization, and;

Whereas, at its December 16, 1992 meeting the Board found that the petition meets the requirements of Minnesota Statutes Section 103D.251, and;

Whereas, at its December 16, 1992 meeting the Board heard testimony as to the merits of the petition and ordered that a public hearing be held on the matter before the Board's Dispute Resolution Committee, and;

Whereas, the public hearing was scheduled and notice of such hearing was given pursuant to Minnesota Statutes Section 103D.221, Subd. 2 and 103D.251, Subd. 6, and;

Whereas, the public hearing was held on January 26, 1993 at the Wood Lake Nature Center, 735 Lakeshore Drive, Richfield, Minnesota and continued on March 23, 1993 at the same location, and;

Whereas, the Dispute Resolution Committee met on April 5, 1993 to consider the testimony, exhibits and letters pertaining to this matter,

Now Therefore, the Dispute Resolution Committee hereby makes the following Findings of Fact, Conclusions and Recommendations:

FINDINGS OF FACT

1. The Order For and Notice Of Hearing was published per Exhibit 4 on January 13, 1993 in the St. Louis Park Sun-Sailor; on January 6 and 13, 1993 in the Richfield Sun-Current; and on January 13, 1993 in the Minnetonka Sun-Sailor.

2. The Minnehaha Creek Watershed District, the Nine Mile Creek Watershed District and the Richfield-Bloomington Watershed Management Organization would have their boundaries changed, as depicted in Exhibits 1, 14, 15 and 26, if this petition is approved. The property affected by the proposed boundary change includes areas tributary to Wood Lake and a limited area along 77th Street within the City of Richfield that would be directed to drain into Wood Lake instead of Nine Mile Creek as part of the 77th Street improvement project. An outlet to Wood Lake would also be constructed as part of said improvement project. In the interim the outlet would flow into a sump and be pumped into the Nine Mile Creek Watershed District. In the future the City of Richfield plans to provide for a gravity outflow.

3. A major portion of the drainage area tributary to Wood Lake lies within the boundaries of the Minnehaha Creek Watershed District. The drainage area is approximately 2 square miles and Wood Lake is approximately 120 acres per Exhibit 12. During past high water events the City of Richfield has laid pipe overland and pumped water from Wood Lake to lessen flooding problems in the area. Wood Lake does not have an outlet to Minnehaha Creek and has never contributed surface water runoff to Minnehaha Creek either by gravity or pumping.

4. The area tributary to Wood Lake has not received any benefits from the operation of the Minnehahah Creek Watershed District that cannot be provided in the future by the Richfield-Bloomington Watershed Management Organization.

5. If the proposed project does not proceed as part of the 77th Street improvement project, future costs to replicate the project would be high since the reconditioned streets would have to be torn up. There is additional benefit to the watershed districts and the City since some of the cost will be defrayed due to federal highway funding presently available.

6. The Department of Natural Resources issued Protected Waters Permit 93-6106 for construction of an outlet and inlet outfall for Wood Lake per Exhibit 24. The permit authorizes an initial

outlet control structure elevation of 819.2 FT MSL which is 1.5 feet below the Ordinary High Water Mark of Wood Lake. The permit contains numerous provisions to limit adverse impacts on Wood Lake.

7. The Richfield-Bloomington Watershed Management Organization has approved the proposed 77th Street project per Exhibit 23.

8. The proposed boundary change will benefit the Richfield-Bloomington Watershed Management Organization by making its legal boundary consistent with both the actual existing watershed boundary and the actual watershed boundary which will exist after construction of the planned drainage improvement projects. The proposed boundary change will benefit the Minnehaha Creek Watershed District and the Nine Mile Creek Watershed District for the same reasons.

9. The Minnehaha Creek Watershed District and the Nine Mile Creek Watershed District can perform the functions for which they were established without the inclusion of the affected area that would be included in the Richfield-Bloomington Watershed Management Organization.

10. The Minnehaha Creek Watershed District passed a resolution in support of the proposed boundary change per Exhibits 20 and 21.

11. The Nine Mile Creek Watershed District has no objection to the proposed boundary change per Exhibit 17. Further, the Nine Mile Creek Watershed District has issued a permit to the City of Richfield for the 77th Street improvement project per Exhibit 18.

12. The Lower Minnesota River Watershed District has no objection to the proposed boundary change per Exhibit 22.

13. The Richfield-Bloomington Watershed Management Organization passed a resolution in support of the proposed boundary change per Exhibit 23.

14. The Richfield Community Services Commission passed a resolution in support of the proposed boundary change per Exhibit 10.

15. The City of Bloomington passed a resolution in support of the proposed boundary change per Exhibit 8.

16. The Richfield-Bloomington Watershed Management Organization passed a resolution per Exhibit 27 to reimburse the Minnehaha Creek Watershed District for engineering and legal costs

incurred which benefit the City of Richfield and the Richfield -Bloomington Watershed Management Organization, to continue the joint feasibility study for the Wood Lake subwatershed, and to accept full legal responsibility for the 77th Street improvement project.

17. Mr. Pete Willenbring, P.E., outlined several issues in Exhibit 11 that support the proposed boundary change.
    a) The Wood Lake basin is landlocked and has never drained to Minnehaha Creek. Wood Lake elevations would have to rise several feet before runout would occur. Both Minnehaha Creek Watershed District and Richfield-Bloomington Watershed Management Organization agree on this per Exhibit 25. wording added
    b) The City of Richfield is committed to pump Wood Lake if water elevations exceed 819.2 FT MSL.
    c) An outlet from Wood Lake to Minnehaha Creek cannot meet Minnehaha Creek Watershed District Rules since it would increase the discharge rate of water flowing into Minnehaha Creek and the District has gone on record that the creek cannot accept more water due to existing flooding problems.
    d) The proposed outfall to I-494 is adequate to accommodate the proposed discharge.
    e) The final design report for the 77th Street improvement project demonstrates it is technically and financially feasible to construct a future gravity outlet from Wood Lake to the south into the I-494 drainage system.

18. The Sierra Club, North Star Chapter, Minneapolis Group objected to the proposed boundary change per Exhibit 6 due to the controversial nature of the petition, that the current watershed boundaries are based on sound hydrologic principles and should remain as established, and that the rules should not be changed to fit the situation.

completely changed

19. Mr. James Spensely testified at the January 26 hearing as the President of the Minnehaha Creek Watershed District and as a private citizen at the March 23 hearing continuance since he was no longer on the Minnehaha Creek Watershed District Board.

completely changed

20. Mr. Spensely challenged the wisdom of the proposed 77th Street improvement project per Exhibit 28, but the record indicates that the project has or will receive the required permits.

completely changed

21. The objections to the boundary change by the Sierra Club and Mr. Spensely are based on unwarranted concerns about the proposed 77th Street improvement project.
    a) Even if the gravity project is not ultimately constructed, the project using a sump and pump will be better than in

(from old IV + V in Conclusions)

the past when overland pipe had to be laid to provide for the pumping into Nine Mile Creek Watershed District.

b) The boundary change increases the amount of watershed currently tributary to Wood Lake by approximately 115 acres. This represents less than a 10% increase in watershed area. Any adverse effects will be ameliorated by the fact that the lake will have an outlet and there will be provisions for the treatment of stormwater reaching Wood Lake, neither of which exists at present.

c) There was no testimony to demonstrate which watershed district or watershed management organization has the more restrictive rules. The Board should not speculate as to whether this is or should be an issue, nor is there any factual basis for making this an issue.

d) Potential wetland impacts of the outlet project will be mitigated by the DNR permit and the Wetland Conservation Act. The Wood Lake Nature Center is owned by the City of Richfield and is nationally recognized, consequently the City will take great care not to adversely impact the pride of their community.

e) Even if the project floods Type 6 wetland, the potential for longer duration flooding is greater without the project than with the project.

f) The project represents a window of opportunity to cost-effectively provide an outlet for Wood Lake.

22. In addition to previously cited exhibits, the following exhibits were also entered into the record.

a) Exhibit 1 - Petition for boundary change
b) Exhibit 2 - Notice and Order of Hearing
c) Exhibit 3 - Affidavit of Mailing of Notice of Hearing
d) Exhibit 5 - Copy of 1/15/93 letter from Nine Mile Creek Watershed District
e) Exhibit 7 - Copy of 1/15/93 letter from Lower Minnesota River Watershed District
f) Exhibit 9 - City of Richfield chronology of events relating to 77th Street project
g) Exhibit 13 - unsigned Exhibit 23
h) Exhibit 16 - bound document entitled "Final Design Report for 77th Street Storm Drainage System Improvements" December, 1992
i) Exhibit 19 - bound document entitled "Feasibility Study for providing an outlet to Richfield Lake and Wood Lake" March, 1993
j) Exhibit 25 - City of Richfield written statement dated March 23, 1993

CONCLUSIONS

I. All relevant substantive and procedural requirements of law and rule have been fulfilled. The Board has proper jurisdiction in the matter of approving a boundary change relating to Minnehaha Creek Watershed District, Nine Mile Creek Watershed District and Richfield-Bloomington Watershed Management Organization pursuant to Minnesota Statutes Section 103D.251.

II. Findings state that Wood Lake has never flowed by gravity to either Minnehaha Creek Watershed District or Richfield-Bloomington Watershed Management Organization. Testimony indicates it would be a toss up as to what direction the water would flow should the water raise several feet. Both Minnehaha Creek Watershed District and Richfield-Bloomington Water Management Organization agree on this.

III. No guidance in law states when a boundary change should be made or allowed when there is a landlocked basin involved or when it is not clear where the water naturally flows. *

old IV + V moved to Finding 21

NEW

IV. The proposed 77th Street Improvement Project will drain the Wood Lake area to the jurisdiction of the Richfield-Bloomington Watershed Management Organization.

V. Exhibits 1, 14, 15 and 26 are maps that depict boundaries of the watershed districts and the watershed management organization, however Exhibit 1 shows the proposed boundary change most clearly.

VI. In consideration of Conclusions I through **V**, approval of the petition would benefit the public welfare and public interest and advance the purpose of Minnesota Statutes Section 103D as directed by Minnesota Statutes Section 103D.251, Subd. 7.

RECOMMENDATIONS

In consideration of the above Findings of Fact and Conclusions, the Dispute Resolution Committee hereby recommends that the Board establish the boundary change as requested by the City of Richfield.

Approved by the Dispute Resolution Committee:

_____

Howard Peterson, Chairman date

Minnesota Board of Water and Soil Resources
Southbridge Office Building
155 South Wabasha Street, Suite 104
St. Paul, Minnesota 55107

In the Matter of the review of the **City of Richfield Petition for a Boundary Change** relating to Minnehaha Creek Watershed District, Nine Mile Creek Watershed District and Richfield-Bloomington Watershed Management Organization pursuant to Minnesota Statutes Section 103D.251.

ORDER APPROVING BOUNDARY CHANGE

Whereas, the Board of Water and Soil Resources (Board) received a petition from the City of Richfield dated December 7, 1992 that requests changes to the boundaries of the Minnehaha Creek and Nine Mile Creek Watershed Districts that would effectively transfer approximately 1225 acres and 173 acres, respectively, from said Districts to the Richfield-Bloomington Watershed Management Organization as further described in Exhibit 1 attached and made a part hereof, and;

Whereas, a public hearing was held on January 26, 1993 at the Wood Lake Nature Center, 735 Lakeshore Drive, Richfield, Minnesota and continued on March 23, 1993 at the same location before the Dispute Resolution Committee, and;

Whereas, the Dispute Resolution Committee approved the attached Findings of Fact, Conclusions and Recommendations dated April 5, 1993 which the Board duly adopts by reference herein;

Now Therefore, the Board hereby makes the following Order:

ORDER

The Board hereby approves the boundary change requested by the petition from the City of Richfield, all in accordance with the Findings of Fact, Conclusions and Recommendations of the Dispute Resolution Committee dated April 5, 1993.

Dated at Saint Paul, Minnesota, this __ day of April, 1993.

Minnesota Board of Water and Soil Resources

_____

BY: D. James Nielson, Chairman

BWSR Exhibit 1 - Petition for boundary change
BWSR Exhibit 2 - Notice and Order of Hearing
BWSR Exhibit 3 - Affidavit of Mailing of Notice of Hearing
BWSR Exhibit 4 - Three Affidavits of Publication of Notice of Hearing
BWSR Exhibit 5 - Copy of 1/15/93 letter from Nine Mile Creek Watershed District stating no objection to proposed boundary change
BWSR Exhibit 6 - 1/15/93 letter from the Sierra Club opposed to the proposed boundary change
BWSR Exhibit 7 - 1/15/93 letter from the Lower Minnesota River Watershed District requesting the record of Hearing remain open for 30 days after the Hearing
BWSR Exhibit 8 - 1/13/93 letter from the City of Bloomington stating a resolution supporting the proposed boundary change

spelling corrected

The aforestated exhibits were entered and everyone present was given the opportunity to review ~~said~~ exhibits.

The City of Richfield testified next. Mr. Clapp swore in Mike Eastling and Pete Willenbring together.

Summary of Mr. Eastling's testimony:

The City of Richfield recognizes the LMWD and MCWD need more time for analysis to be completed and that a 60 day continuance is in accord with the City of Richfield's needs. The City of Richfield has coordinated with the City of Bloomington and Bloomington is in agreement with the proposed boundary change. The City of Richfield has coordinated with the Metropolitan Airports Commission (MAC) and MAC has given their approval to the general concept. The City of Richfield has had a series of meetings with the MCWD since 11/5/92. The following exhibit was entered as a chronology of those meetings.

Petitioners Exhibit 9 - Chronology of Events relating to MCWD review of 77th Street Project

Petitioners Exhibit 10 - Resolution by the Richfield Community Services Commission in support of proposed boundary change

Mr. Eastling pointed out that there is still some information lacking with respect to the issues concerning MCWD.

Mr. Willenbring entered an exhibit:

Petitioners Exhibit 11 - Memo to Mr. Eastling dated 1/26/93 from Mr. Willenbring listing five items in support of the boundary change

Mr. Willenbring stated the five items and summarized the content of Exhibit 11.

Mr. Eastling entered an exhibit:

Petitioners Exhibit 12 - bound document entitled "Addendum to Richfield - Bloomington Watershed Management Plan" dated January 1993 by OSM & Associates

Mr. Eastling entered an exhibit:

Petitioners Exhibit 13 - Resolution 93.1 supporting the proposed boundary change by the RBWMO which is unsigned but supposedly adopted, a signed copy will be forwarded soon

Mr. Willenbring advised the Board that the City of Richfield has also discussed with the MCWD the discharge of Richfield Lake to an uncertain destination but towards the Mississippi River and that it would have a limited bearing on the Wood Lake discharge. However, the Wood Lake discharge could be merged with the Richfield Lake outlet and it looks feasible from an engineering perspective. The results of that study will be entered in the near future.

Chairman Peterson then addressed the Committee and Mr. Clapp and questioned the process of continuing the hearing. Mr. Clapp stated that it merely meant that in about 60 days we would all meet again.

Mr. Clapp then questioned if the continuance would also include the study of the Richfield Lake outlet.

Mr. Willenbring stated yes, it could involve both lakes.

Mr. Eastling wondered if this matter could be continued back to a regular BWSR board meeting to minimize time and effort. The general consensus was no, the process would involve another public hearing.

Chairman Peterson requested a map depicting the area so the Committee could understand the situation better. Mr. Eastling displayed a map, then Mr. Willenbring presented a map to the Committee for review and education. Mr. Willenbring showed major

landscape features including Wood Lake and the proposed outlet along the I-494 drainage system along with other incidental features. Mr. Willenbring explained two phases to the project. Presently the I-494 inlet is too high and a lift station would be needed until I-494 was reconstructed, then gravity feed would work. The I-494 reconstruction plans have received preliminary approval according to Mr. Willenbring. Mr. Willenbring showed another map which depicted the District boundaries and proposed boundary change. Mr. Willenbring entered these two maps as exhibits:

Petitioners Exhibit 14 - Map with green line showing existing watershed boundaries

Petitioners Exhibit 15 - Map with orange line showing proposed boundary change

Mr. Eastling spoke of the impacts of high water on the Wood Lake Nature Center. The City of Richfield has had to pump out water at times, but the proposed outlet would alleviate the need for pumping. Mr. Eastling spoke of the need for an outlet at Richfield Lake. The high water is devastating to homes in that area. The water stayed high in 1987 for over one week and caused a lot of damage. Outlets are needed for both lakes and Mr. Eastling stated the City of Richfield cannot pass this opportunity up.

Mr. Sandstrom asked if Richfield Lake was higher than Wood Lake.

Mr. Willenbring stated that presently Richfield Lake is about five feet higher than Wood Lake. At Wood Lake the water level would have to rise about 15 feet in order to overflow now and it could overflow to I-35W and/or to MCWD. Mr. Willenbring felt the overflow could go either way or both ways and it was very difficult to determine at this time. One foot of fill in a ditch could be the determining factor according to Mr. Willenbring.

Mr. Eastling pressed that the City of Richfield would still prefer a continuance.

Mr. Willenbring said the DNR OHWM is 820.7 FT MSL.

Ms. Roer asked how would Wood Lake change with the new outlet.

Mr. Eastling said it would only change in conjunction with high rainfall events. The water would run out of Wood Lake sooner.

wording changed

Ms. Roer questioned if the water levels of Wood Lake fluctuate greatly now.

Mr. Eastling stated that the City of Richfield wants to regulate that fluctuation.

Mr. Willenbring said that a DNR protected waters permit has been applied for to change the outlet elevation.

Mr. Rossman asked if the continuance request was a separate item.

Mr. Clapp responded that the continuance could be granted or denied at this time.

Mr. Willenbring pointed out that the LMRWD requested more time for review.

Mr. Nielson moved to grant the continuance request and accept testimony later.

Mr. Boulton seconded the motion.

Mr. Willenbring stressed that they had hoped to hear testimony now so there would be no surprises later.

Mr. Eastling submitted an exhibit:

Petitioners Exhibit 16 - bound document entitled "Final Design Report for 77th Street Storm Drainage System Improvements" dated December 1992 by OSM & Associates

Mr. Nielson withdrew his motion and asked what the purpose of testimony was now since it was such an early stage and analyses and data were outstanding yet.

Mr. Spensley testified, summary follows:

Much progress has been made considering the pro's and con's of the proposed project. Much data is not yet available for the outlet. The DNR has determined the OHWM. Wetlands could be impacted with the proposed project and those impacts must be considered. However, the studies have not been done yet. MCWD hopes the action of the Board would be to deny the petition and later, when data and studies were available, the petition could be made again. MCWD feels there is enough evidence to deny the petition at this time.

A short postponement would not be correct. MCWD wants the petition denied tonight without prejudice. If the outlet plan stays the same later as what is proposed now, the petition could be reentered.

Mr. Nielson asked why the hearing process should be gone through twice, then.

Mr. Spensley stated he hoped there would be an opportunity to decide the petition based on present studies. It seems simplest to deny the petition now based on the evidence at hand.

Chairman Peterson stated the purpose of the hearing was to gather information and evidence. Mr. Spensley and others have the opportunity to present such. A decision will be made later.

Mr. Spensley stated he wants to present more information to allow the Board to understand the District's position.

spelling corrected

Ms. Roer stated she wants to hear the MCWD position and the support of that position.

Mr. Spensley stated he believes a continuance is not necessary and is unlawful. Mr. Spensley will present more testimony to support denial of the petition.

Chairman Peterson asked Mr. Clapp about continuing the hearing.

Mr. Clapp said the Committee can decide on the continuance at this time.

Mr. Nielson reentered his motion for continuance.

Mr. Sandstrom noted that Petitioners Exhibits 15 and 16 had not been officially entered into the record. They were officially entered at this time.

Mr. Boulton seconded the motion by Mr. Nielson.

Chairman Peterson asked Mr. Clapp if the Dispute Resolution Committee's position would be prejudiced by continuance.

wording added

Mr. Clapp said no.

Mr. Nielson stated the Committee should set a date for the continued hearing at not more than 60 days from now. March 23 was set as the date at 7 pm at the Wood Lake Nature Center or such other place as mutually agreed upon.

Mr. Boulton seconded the motion.

Mr. Rossman asked what was expected at this time.

Mr. Clapp responded that we don't know.

Mr. Rossman wondered if there was any direction to be given to the issues to be resolved.

Mr. Spensley stated there was enough evidence now to support denying the petition. There may be other parties that should or would like to present arguments. MCWD would like to present their position. This information would address Mr. Rossman's concern.

Mr. Eastling said they would like to hear all the issues now so they could address them by the next hearing.

Mr. Nielson stated that reasonable people will act in good faith.

A roll call vote was made on Mr. Nielson's motion as follows:

Boulton: Aye
Rossman: Nay
Peterson: Aye
Roer: Aye
Nielson:Aye

Motion Carried.

Chairman Peterson stated this portion of the hearing will be continued until March 23 when it is reconvened here.

Hearing adjourned at 8:12 PM.

Respectfully submitted:

Jim Haertel
Board Conservationist

Approved by the Dispute Resolution Committee:

_____

BY: Howard Peterson, Chairman date

B

SNAKE RIVER JOINT POWERS AGREEMENT

MN BOARD OF WATER & SOIL RESOURCES RECOMMENDED CHANGES & MODIFICATIONS

BWSR staff attended a Snake River JPA meeting on April 8, 1993. The purpose of the meeting was to present recommended changes to the agreement based on Board member input since the March 24, 1993 board meeting. Staff also during this time requested a review of the JPA by Bill Clapp, Special Assistant Attorney General.

The following numbered items show the BWSR recommended changes and the Snake River Counties decision. Additions are shown as underlined text, deletions are shown as strikeout text.

#1 Page 1, Sect. II. B. Purpose

B. Provide for the joint and cooperative management of county water plans and other actions necessary to protect and enhance the water and land resources within the Snake River Watershed.

County action - approved change

#2 Page 2, Sect. II. New item E. Purpose

E. Develop a watershed management plan for the Snake River Watershed.

County action - approved new item

#3 Page 3, Sect. IV. F. Powers

F. The SRWMB shall ~~have the authority to~~ appoint a citizen ~~or other~~ advisory committee and may appoint other advisory committees as it deems necessary to advise the SRWMB about various matters pertinent to development of plans, projects and improvements within the Watershed.

County action - approved changes

#4 Page 3, Sect. IV. M. Powers

M. Provide for monthly meetings during the first six months of operation and then at least quarterly thereafter. Times and locations of meetings will be set at the annual meeting of the SRWMB which shall be in January of each year at the Kanabec County Board Room unless action is taken for alternative times and places. Notice of all meetings shall be by publication in accordance with Minnesota Statutes.

County action - approved changes

#5 Page 2, Sect. IV. Powers - Recommendation for new item

N. The SRWMB may pay citizen advisory committee members per-diem and expenses at a rate established by the SRWMB.

County action - approved changes

#6 Page 2, Sect. IV. General Comment

There was a general comment that the section on "Powers" should be separated into two parts one being those items which the SRWMB shall do, and the second part being those items which the SRWMB may do.

County action - separated mays and shalls into two sections in final JPA.

#7 Page 4, Sect. V. A. Officers

A. The SRWMB shall ~~appoint~~ elect its officers from amongst the then members which shall consist of a Chairperson, Vice Chairperson and Secretary.

County action - approved changes

#8 Page 4, Sect VI. A. Citizen Advisory Committee

A. There shall be established a citizen advisory committee consisting of one (1) Soil & Water Conservation District Supervisor from each county and two (2) citizens from each county, at least one of which would be a lake association member from a lake association within the Watershed if one exists within that county. Each county's representatives on said Citizen Advisory Committee shall be appointed by the county board. In the case of the Soil & Water Conservation District and the lake association that member shall be appointed from a list of at least three (3) provided by the Soil & Water Conservation District and the lake association if one exists. The term of office shall be for three (3) calendar years except that the initial term shall be for one (1) for one calendar year; one (1) for two calendar years; and one (1) for three calendar years. Any vacancy shall be filled by the county board to which that seat is attributed and shall be for the remainder of the term. No ~~single~~ person may be a member of this board for more than three (3) consecutive full or partial terms. The above rotation schedule shall be applicable unless this agreement is not renewed after the initial two (2) year term of this agreement.

County action - approved change

#9 Page 5, Sect. VII. Budget

The Board members which commented on the agreement recommended that the agreement provide for the establishment of a preliminary fund for the purpose of carrying out the

activities of the SRWMB during the initial year of operation and establishment of the first budget.

Recommended language:

C. Preliminary Fund

(1) The SRWMB shall establish a preliminary fund in the amount of $10,000 dollars for the purpose of paying administrative expenses and other related costs during the first year of operation.

(2) Each county shall contribute its share on the same basis as defined in Section VII. A. (3) of this agreement.

(3) If funds remain in the preliminary fund after the first year it shall be transferred to the administrative account of the SRWMB.

County action - approved addition

#10 Page 7, Second Paragraph

Change two-thirds to three-fourths

County action - approved change

#11 Page 8, Sect. IX. Review

Members of the Board requested that the counties consider mediation or use of the BWSR dispute resolution committee as an intermediary step before District Court.

County action - B. Any member county or local unit of government with territory within the Snake River Watershed may request the Minnesota Board of Water and Soil Resources to resolve disputes pursuant to 1990 M.S. Section 103B.345.

Based on the agreed to changes listed above staff will be presenting the JPA to the Board at its April 28, 1993 meeting for acceptance. At the meeting we will basically be asking the Board to do two things;

1. Accept the Joint Powers Agreement as adequate and instruct staff to work with the Petitioners to withdraw the petition for establishment of the Snake River Watershed District; and,

2. Direct staff to establish an annual review of the Snake River Joint Powers Board, with the first report to be done in January of 1994.

AGREEMENT ESTABLISHING JOINT POWERS SNAKE RIVER WATERSHED MANAGEMENT BOARD

THIS AGREEMENT, is made by and between the counties which contain the Snake River Watershed, namely: Aitkin County, Kanabec County, Mille Lacs County and Pine County, Minnesota; each of the parties hereto being authorized to enter into this agreement by the action of the Commissioners of the respective counties.

WHEREAS, each of the counties hereto has developed a county water plan pursuant to Section 103B.301 through Section 103B.355 Minnesota Statutes 1990 in which the water planning needs of the Snake River Watershed within said county are addressed; and

WHEREAS, there is a need to coordinate and implement actions to be undertaken within said plans;

NOW, THEREFORE, the parties hereto hereby enter into this Joint Powers Agreement pursuant to Section 471.59 Minnesota Statutes for the purposes and with the powers and other provisions as set forth in this agreement.

I. NAME

The name of this joint powers board shall be Snake River Watershed Management Board (SRWMB). Its address shall be c/o County Auditor, Kanabec County Courthouse, 18 North Vine Street, Mora, MN 55051.

II. PURPOSE

The purpose of this joint powers agreement shall be for the joint powers to:

A. Coordinate the comprehensive county water plans and actions relating thereto as existing in the water plans of the several counties that are signatories to this agreement and to provide for the implementation of the actions as set forth in said plans. For the purposes of this agreement, the Snake River Watershed is delineated by Exhibit A annexed hereto.

B. Provide for the joint and cooperative management of county water plans and other actions necessary to protect and enhance the water and land resources within the Snake River Watershed.

C. Identify existing and potential problems and opportunities for the protection, management and development of water and related land resources.

D. Develop objectives and carry out a plan of action to promote sound hydrologic management of water and related land resources, effective environmental protection and efficient management.

E. Develop a watershed management plan for the Snake River Watershed.

III. ORGANIZATION

A. To carry out the plans of this joint powers agreement, there is hereby established a joint powers board to be known as the Snake River Watershed Management Board (SRWMB). The appointments to the SRWMB shall be made by the county boards of the counties to which each particular seat is attributed.

B. The SRWMB shall be four (4) in number, which shall be a County Commissioner from each of the counties of Aitkin, Kanabec, Mille Lacs and Pine. Each member county shall have one (1) vote. Each member county may designate an alternate for its appointed County Commissioner. All votes of member counties must be cast by the appointed County Commissioner or designated alternate County Commissioner of the member county at a meeting of the SRWMB.

C. Each member shall be appointed to the joint powers board by its county board and shall hold office until that member's successor has been appointed and qualified. Any vacancy arising during the term shall also be filled by the county board to which that particular seat is attributed.

D. Any member who is more than sixty (60) days in default in paying its share of administrative expenses shall have the vote of its board member suspended pending such payment.

E. A favorable vote of a majority of all of the eligible then existing board members shall be required for the SRWMB to take action, unless otherwise provided in this Agreement.

IV. POWERS

The Snake River Watershed Management Board shall have the following powers:

A. The Snake River Watershed Management Board may:

1. Coordinate and implement the comprehensive county water plans of the respective counties as they relate to the Snake River Watershed as a single entity.

2. Create a single water plan for the Snake River Watershed from the comprehensive water plans of the member counties.

3. Contract for space and materials and may also contract for goods and services that are required and are necessary for the implementation of the water plans relative to the Snake River Watershed.

4. Employ such persons as it deems necessary to accomplish its duties and purposes.

5. The SRWMB may accumulate reserve funds for the purposes herein mentioned and may invest funds of the SRWMB not currently needed for its operations, in the manner and subject to the laws of Minnesota applicable to counties.

6. Recommend changes in this Agreement to its members.

7. Protect and improve water quality in the watershed as this is one of the main purposes set forth in the Surface Water Management Act.

8. Contract for or purchase such insurance as the SRWMB deems necessary for the protection of the SRWMB.

9. Accept and disburse funds and to apply for state and federal funds necessary to prepare and implement its plan.

10. Pay citizen advisory committee members per diem and expenses at a rate established by the SRWMB.

B. The Snake River Watershed Management Board shall:

1. Appoint a citizen advisory committee and may appoint other advisory committees as it deems necessary to advise the SRWMB about various matters pertinent to development of plans, projects and improvements within the Watershed.

2. Cause to be made an annual audit of the books and accounts of the SRWMB and shall make and file a report to its members at least once each year including the following information:

(1) The financial condition of the SRWMB, and

(2) The business transacted by the SRWMB and other matters which affect the interests of the

SRWMB. Copies of the report shall be transmitted to the Clerk of each member governmental unit.

3. Adopt by-laws addressing, among other matters, rules of order and procedure, which unless otherwise adopted, shall be that of Roberts Rules of Order.

4. Provide for monthly meetings during the first six months of operation and then at least quarterly thereafter. Times and locations will be set at the annual meeting of the SRWMB which shall be in January of each year at the Kanabec County Board Room unless action is taken for alternative times and places. Notice of all meetings shall be by publication in accordance with Minnesota Statutes.

V. OFFICERS

A. The SRWMB shall elect its officers from its members which shall consist of a Chairperson, Vice Chairperson and Secretary at the annual meeting.

(1) The Chairperson shall preside at the meetings of the Joint Powers Board and shall have powers to call meetings at reasonable times and with reasonable notice as deemed necessary.

(2) The Vice Chairperson shall preside over the meetings of the Joint Powers Board in the absence of the Chairperson. The Vice Chairperson shall have the power, with two other members of the Board, to call meetings.

(3) The Secretary shall keep, or designate a person to assist in keeping, a record of all proceedings of the Joint Powers Board and to perform all other duties normally assigned to the secretary of a deliberative body. The term of office of the secretary shall run concurrently with the Chairperson.

B. The Kanabec County Auditor shall be the fiscal agent for the SRWMB. Disbursements shall be made by the fiscal agent upon action of the SRWMB.

VI. CITIZENS ADVISORY COMMITTEE

A. There shall be established a citizen advisory committee consisting of one (1) Soil & Water Conservation District Supervisor from each county and two (2) citizens from each county, at least one of which would be a lake association member from a lake association within the Watershed if one exists within that county. Each county's representatives on said Citizens

Advisory Committee shall be appointed by the county board. In the case of the Soil & Water Conservation District and the lake association, that member shall be appointed from a list of at least three (3) provided by the Soil & Water Conservation District and the lake association if one exists. The term of office shall be for three (3) calendar years except that the initial term shall be for one (1) for one calendar year; one (1) for two calendar years; and one (1) for three calendar years. Any vacancy shall be filled by the county board to which that particular seat is attributed and shall be for the remainder of the term. No single person may be a member of this board for more than three (3) consecutive full or partial terms. The above rotation schedule shall be applicable unless this agreement is not renewed after the initial two (2) year term of the agreement.

B. The duties of the Citizens Advisory Committee shall be to aid the SRWMB in identifying and prioritizing action item projects of the comprehensive water management plans of the SRWMB and the member counties which would be best addressed on a multi-county basis, to identify and recommend projects or activities for consideration by the SRWMB that have been requested by citizens or municipalities in the watershed and for such other matters for which the SRWMB requests its assistance.

C. Each county shall be responsible for paying for any expenses afforded to its delegate and for the citizens advisory committee members from that county unless otherwise agreed upon by the SRWMB.

VII. BUDGET

A. Administrative Expenses:

(1) Administrative expense shall be those expenses administrative in nature and distinct from project expenses. Administrative expenses shall include but are not limited to, insurance, supplies, salaries and rent.

(2) On or before May first of each year, the SRWMB shall prepare and adopt an administrative budget for the forthcoming calendar year upon a favorable vote of a majority of all of the eligible then existing board members. Said administrative budget shall then be forwarded to the boards of the member counties. The secretary of the SRWMB shall certify the budget on or before May 15 to the clerk of each member's county board together with a statement of the proportion of the budget to be provided by each member. The county board of each member county agrees to review the budget within thirty (30) days of the date of certification. The SRWMB shall then hear all timely objections to the budget, and may, upon notice to all member counties and after a hearing, modify or amend the budget, but shall then

give notice to the member counties of any and all modifications or amendments. Further review shall be pursuant to Article IX B.

(3) To the extent that administrative expenses of the SRWMB are to be borne by the counties, the contribution by the member counties shall be in accordance with the following formula:

Aitkin County	20.8
Kanabec County	49.5
Mille Lacs County	9.2
Pine County	20.5

Portions of the obligation may be by in kind contribution upon approval of the SRWMB.

(4) Expenses for action item projects fully funded by grants shall be considered administrative expenses.

B. Project Expenses:

(1) On or before March first of each year each of the member county boards shall preliminarily determine and notify the SRWMB of action item projects of that county's water plan related to the Watershed including the means and extent of funding which it intends to implement in each of the two forthcoming calendar years. An action item project may be any proposed project. Action item project expenses include costs for feasibility studies and other measures preparatory to a decision to implement any project.

(2) On or before May first of each year, the SRWMB, with the assistance of the Citizens Advisory Committee, shall from the action item projects submitted by the member counties, and from the action item projects submitted by the Citizens Advisory Committee, identify those action item projects from the water plans of the individual counties and from the Citizens Advisory Board which would be best addressed on a multi-county basis. The SRWMB shall then from the list of action item projects so identified for each year, prioritize the same and determine which of those projects should be addressed in each calendar year. The member counties shall then pursue the action items on the revised list cooperatively through the SRWMB.

(3) On or before May first of each year, the SRWMB shall prepare and forward to each member county the budget for the multi-county comprehensive water management plan action items which are to be addressed by the SRWMB on a multi-county basis in the forthcoming calendar year, consistent with the determinations of the SRWMB in (2) above.

(4) The SRWMB shall, after considering input from the affected member counties, also determine and apportion the projected expenses to be borne by each of the member counties for each multi-county undertaking. The allocation among the member counties shall be projected based upon one or more of the following methods:

(a) The ratio of real property valuation of each member county within the boundaries of the benefited area to the total real property valuation within the entire benefited area.

(b) The ratio of quantity and/or quality of the stormwater produced by each member county within the boundaries of the benefited area to the total quantity of stormwater produced by the entire benefited area.

(c) The ratio of benefit received by each member county to the total benefit received by the entire area of the project.

(d) The SRWMB may use any such other suitable criteria as shall be agreed upon by all the member counties.

Prior to implementing an action item project the SRWMB shall secure from its engineers or other competent persons a preliminary report advising it whether the proposed improvement is feasible and as to whether it shall best be made as proposed or in connection with some other improvement and the estimated cost of the improvement as recommended. Any feasibility study shall examine, among other things, the costs of, and potential funding sources available for the proposed improvement and all options available to implement the improvement including but not limited to low cost options. The SRWMB shall then hold a public hearing on the proposed action item project after mailed notice to each member county and published notice in the SRWMB's official newspaper. The notice shall be mailed not less than forty-five (45) days before the hearing, shall state the time and place of the hearing, the general nature of the improvement, the estimated total cost and the estimated cost to each member county.

To order an action item project, a resolution setting forth the order shall require a favorable vote of three-fourths of all of the eligible then existing board members. The SRWMB, in considering whether to order any action item project, may consider the factors of costs and funding as those factors are detailed in the feasibility study. The order shall describe the improvement, shall allocate in percentages the cost allocation between the member counties, shall designate the engineers to prepare plans and specifications, and shall designate who will contract for the improvement.

After the SRWMB has ordered an action item project, it shall forward the preliminary report to all member counties with an estimated time schedule of the implementation of the action item project. The SRWMB shall allow an adequate amount of time, and in no event, less than ninety (90) days for each member county to conduct hearings in accordance with the provisions of Chapter 429 or the charter requirements of any city, or to ascertain the method of financing which the member counties will use to pay their proportionate share of the costs of the action item project.

If the SRWMB proposed to use the counties' bonding authority, or if the SRWMB proposes to certify all or any part of an action item project to the counties for payment, then and in that event all proceedings shall be carried out in accordance with Minnesota Statute 103B.251.

The SRWMB shall not order and no engineer shall prepare plans and specifications before the SRWMB has adopted a resolution ordering the action item project. The SRWMB may order the advertising for bids upon receipt of notice from each member county who will be assessed that it has completed its hearing or determined its method of payment, or upon expiration of ninety (90) days after the mailing of the preliminary report to the member counties, whichever occurs first.

C. Preliminary Fund

(1) The SRWMB shall establish a preliminary fund in the amount of $10,000 dollars for the purpose of paying administrative expenses and other related costs during the first year of operation.

(2) Each county shall contribute it share on the same basis as defined in Section VII.A.(3) of this agreement.

(3) If funds remain in the preliminary fund after the first year it shall be transferred to the administrative account of the SRWMB.

VIII. AMENDMENTS

Amendments to this agreement shall be the agreement in writing of all parties hereto with the authority of the County Board of each member county.

IX. REVIEW

A. A member county can demand a review from any action taken by the SRWMB by filing an appeal to the SRWMB within thirty (30) days of the action taken by the SRWMB about which the member county desires review. Thereupon the SRWMB shall hold a hearing

and reconsider its action in light of the testimony or other evidence introduced at the hearing.

B. Any member county or local unit of government with territory within the Snake River Watershed may request the Minnesota Board of Water and Soil Resources to resolve disputes pursuant to 1990 M.S. Section 103B.345.

X. DURATION

A. Each member county agrees to be bound by the terms of this agreement until two (2) years from and after its effective date unless the member county withdraws from the agreement pursuant to X C or the SRWMB is dissolved pursuant to X B. The Agreement may be continued thereafter upon the agreement of all the parties.

B. Any member may petition the SRWMB to dissolve the agreement. The SRWMB shall give the Minnesota Board of Water & Soil Resources written notification of the receipt by the SRWMB of any petition to dissolve the agreement. Upon ninety (90) days notice in writing to the clerk of each member governmental unit and to the SRWMB, the SRWMB shall hold a hearing and upon a favorable vote by a majority of all eligible votes of then existing board members, the SRWMB may by resolution recommend that the SRWMB be dissolved. The resolution shall be submitted to each member governmental unit and each county within sixty (60) days. The SRWMB shall dissolve the SRWMB allowing a reasonable time to complete work in progress and to dispose of personal property owned by the SRWMB.

C. Any member county may withdraw from this agreement at the end of any calendar year by providing written notice to the SRWMB and each of the member county boards of their intention to do so ninety (90) days in advance of the end of that calendar year providing that county shall have met any outstanding obligations by virtue of its membership in the joint powers agreement until the date of the withdrawal. The SRWMB shall give the Minnesota Board of Water & Soil Resources written notification of the receipt by the SRWMB of any written notice by a member county to withdraw from the agreement.

XI. DISSOLUTION

Upon dissolution, the personal property shall be returned to the member county contributing the same. In the event the source of the property is not identifiable, it shall be distributed in accordance with the formula set forth in Article VII A(3).

XII. EFFECTIVE DATE

The effective date of this agreement will be the ____ day of April, 1993, the dates of the signatures of the parties notwithstanding.

AITKIN COUNTY BOARD

By _____
Chairman

By _____
Auditor

Date _____

KANABEC COUNTY BOARD

By _____
Chairman

By _____
Auditor

Date _____

MILLE LACS COUNTY BOARD

By Paul A. Rinman Jr.
Chairman

By Elmer Waoli
Auditor

Date 4-20-93

PINE COUNTY BOARD

By _____
Chairman

By _____
Auditor

Date _____

C

Minnesota Board of Water & Soil Resources

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:

Highway 15 S.
Box 756
New Ulm, MN 56073
(507) 359-6074
Fax (507) 359-6018

1200 S. Broadway
Room 144
Rochester, MN 55904
(507) 285-7458

Box 267
1400 E. Lyon Street
Marshall, MN 56258
(507) 537-6060
Fax (507) 537-6368

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Southbridge Office Building
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M E M O R A N D U M

April 16, 1993

TO: Board Members

FR: Jim Haertel, Board Conservationist

RE: WATERSHED MANAGEMENT PLANNING FOR FORMERLY EXEMPT METRO AREAS

The Metropolitan Watershed Management Act (Act) was amended in 1990 to require watershed management plans for areas that were formerly exempt from planning in the seven-county metro area (MS 103B.205 to 103B.255). We have been assisting local governmental units to come into compliance with the Act.

A policy determination should be made pursuant to MS 103B.231, Subd. 1 (b) which regards whether a few small metro areas on the fringe of the seven-county metro area should be allowed to meet the watershed management planning requirement by being included in an adjacent non-metro county's local water plan (LWP) or be required to plan under the Act.

The areas presently of concern are the cities of Rockford and Hanover where a large portion of each city is in Wright County and a small portion is in Hennepin County. The areas of each city in Wright County are presently included in the Wright County LWP. It is each city's desire to include their entire city in the Wright County LWP. If not allowed, other options would be for each city to prepare a plan under the Act for at least the area in Hennepin County, otherwise join a neighboring WMO or WD.

I have polled the various WMO's that could include these areas of Rockford and Hanover. These WMO's do not perceive a need to include Rockford and Hanover in their organizations. These WMO's do not feel there are any special hydrologic, development or other problems that would necessitate inclusion of these areas into their organizations.

I have consulted with BWSR staff and Bill Clapp on this issue and the interpretation of MS 103B.231, Subd. 1 (b). It is our opinion the statute clearly allows the Board to make the policy determination.

The recommendation of BWSR staff is to allow watershed management planning in these small metro fringe areas under the adjacent county's LWP.
City of Rockford + Hanover
to remain in Wright Co. water plan.

c: Bruce Sandstrom
Ron Harnack

Staff will send a cover letter to the USF&WS and the Land Exchange Board on this issue and the Association of Minnesota Counties will work with the Land Exchange Board on this issue. Brooks, Jr., stated that the BWSR should take the leadership role in resolving these types of issues with various agencies involved. Ron Harnack stated that the BWSR is in the policy lead regarding wetland restoration. Staff will work with other agencies on this issue. Mr. Schultz, USF&WS, thanked the BWSR for the opportunity to come before the board and said he looks forward to working in a cooperative partnership on these issues.

Chairman Ogaard adjourned the meeting for lunch at 12:35 p.m. The meeting reconvened at 1:25 p.m.

Anderson Window/DNR Land Transfer - Ron Harnack introduced Roger Holmes and Kim Hennings, Department of Natural Resources, and Jerry Larson, Anderson Window Corporation. The BWSR is involved in the land exchange issue between DNR and Anderson Window because the BWSR needs to give consent to the land exchange due to the existence of marginal lands and wetlands. Roger Holmes explained the land exchange which involves 240 acres in a wildlife area in Washington County. DNR recommends approval of the land exchange. Moved by Boulton, seconded by Brooks, Jr., directing staff to work with those involved in this land exchange initiative. Affirmative: Ogaard, Williamson, Boulton, Warner, Graba, Brooks, Jr., Harste, Cofell, Peterson, and Jensen. Opposed: None. Carried. Staff will send a formal letter to Department of Natural Resources and Anderson Window Corporation informing them of the action taken by the BWSR.

** 91-47

PL566 Watershed Planning - Gene Kalmes, Winona SWCD, Laurie Hassler, Olmsted SWCD and Coordinator of the Whitewater Watershed Project, and Nick Persons, SCS, were introduced. Laurie gave a brief overview and asked the BWSR to consider a request from the Whitewater Joint Powers Board to approve a P.L. 566 application for the Whitewater Watershed Project. After hearing a presentation on the proposed project and how it would complement other local resource management efforts in the watershed, it was moved by Cofell, and seconded by Warner, that the BWSR approve the P.L. 566 application for the Whitewater Watershed as a high priority project. Affirmative: Ogaard, Williamson, Boulton, Warner, Graba, Brooks, Jr., Harste, Cofell, Peterson, and Jensen. Opposed: None. Carried. Staff will send a letter to the joint powers board and SCS to inform them of the BWSR's action taken today.

** 91-48

Marine WMO Plan - Mark Nelson introduced Bill Campion and Tim Fredbo, representatives of the Marine WMO. Mark gave a brief overview of the Marine WMO Plan. Staff recommends approval of the plan. Moved by Graba, seconded by Harste, to approve the Marine WMO Plan. Affirmative: Ogaard, Williamson, Boulton, Warner, Graba, Brooks, Jr., Harste, Cofell, Peterson, and Jensen. Opposed: None. Carried.

** 91-49

Advisor Comments

- Soil Conservation Service (SCS): Roger Mussetter reported that the 1990 Farm Bill

D

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375 Jackson Street, Suite 600
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April 8, 1993

Mr. Ronald Harnack
MN Board of Water and Soil Resources
155 S. Wabasha, Suite 104
St. Paul, Minnesota 55107

Dear Ron:

This letter is being written regarding the Soil Conservation Service's presentation to the Board of Water and Soil Resources (BWSR) on April 28, 1993, dealing with the submittal of four applications for a planning start for the Whitewater River Watershed (under the authority of PL-566, the Small Watershed Program).

On May 28, 1991, the BWSR reviewed the original application for the Whitewater River Watershed and designated it as a "high" priority (see attached copy of your letter). This request is considered a revision on the original application, since the basic description, problems, sponsors, and other concerns remain the same.

The splitting up of the Watershed into four subbasins for PL-566 planning purposes has been verbally approved by the Joint Powers Board (JPB) and will be formally approved at their April 15, 1993 board meeting. The two primary reasons for splitting up the watershed include:

1. The ability to scope problems down in each subwatershed, while maintaining the entire Whitewater Watershed as a total basin;

2. Submitting four final watershed plans that will be low enough in cost to be approved by me at the state level.

A point that is worth reemphasizing is the concept that the Whitewater Watershed will continue to be planned as a total basin in four concurrent efforts. This will enable problems in the entire basin to be considered by the JPB and technical specialists.

I have attached one complete set of preauthorization documents for your use. In addition, I have enclosed a number of copies of the Summary Fact Sheets for each of the four subwatersheds, which could be distributed to your board members prior to the meeting.

Contact Tim Koehler at 290-3682 if you have any questions prior to the April 28 meeting. If possible, please let me know what time this item will appear on the agenda. This presentation could be limited to 10-15 minutes with time for questions as needed.

Sincerely,

David R Benner, Acting

GARY R. NORDSTROM
State Conservationist

cc: w/o enclosures
Eugene Kalmes, Chair, Winona SWCD, Lewiston, MN
Shelly Eckblad, Whitewater Watershed Project, Rochester, MN
Jon DeGroot, Asst. State Conservationist, SCS, St. Paul, MN
John Nicholson, Area Conservationist, SCS, Rochester, MN
Timothy A. Koehler, WR Staff Leader, SCS, St. Paul, MN
Mark Kunz, District Conservationist, SCS, Lewiston, MN
Dave Copeland, District Conservationist, SCS, Rochester, MN
Mark Kulig, District Conservationist, SCS, Wabasha, MN
Robert Bird, Planning Engineer, SCS, St. Paul, MN
William Lorenzen, Biologist, SCS, St. Paul, MN

Minnesota Board of Water & Soil Resources

Southbridge Office Building
155 South Wabasha St., Suite 104
St. Paul, Minnesota 55107

(612) 296-3767
Fax (612) 297-5615

May 28, 1991

Mr. Gary R. Nordstrom
State Conservationist
Soil Conservation Service
600 FCS Building
375 Jackson Street
St. Paul, MN 55101

Dear Mr. Nordstrom:

On May 22, 1991 the BWSR considered a request from the Whitewater Joint Powers Board to approve a P.L. 566 application for the Whitewater Watershed Project. After hearing a presentation on the proposed project and how it would complement other local resource management efforts in the watershed, the BWSR unanimously passed the following resolution:

"To approve the P.L. 566 application for the Whitewater Watershed as a high priority project."

The BWSR looks forward to working closely with the local sponsors and the SCS on the project.

Sincerely,

Ron Harnack
Executive Director

cc: Eugene Kalmes, Whitewater Joint Powers Board
Laurie Hassler, Olmsted SWCD
James Stewart, Winona County SWCD
Dave Peterson, BWSR

Regional Offices

Northwest Region
1106 Paul Bunyan Drive, NE
Bemidji, MN 56601
218-755-3963

Northeast Region
394 South Lake Avenue
Room 403
Duluth, MN 55802
218-723-4752

West Central Region
503 Washington Street
Brainerd, MN 56401
218-828-2604

South Central Region
Box 756
New Ulm, MN 56073
507-359-6074

Southeast Region
Friedell Bldg., Room 100
1200 S. Broadway
Rochester, MN 55904
507-285-7458

Southwest Region
Box 267
1400 E. Lyon Street
Marshall, MN 56258
507-537-6060

East Central Region
Southbridge Office Building
155 South Wabasha St., Suite 104
St. Paul, MN 55107
612-296-3767

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Summary Fact Sheet

Request for Planning Authorization

Project: Lower Whitewater River Watershed
State: Minnesota
Watershed Size: 45,600 acres
Date of Application: May, 1990; April, 1993

Watershed Project No. 9043
Counties: Wabasha and Winona
Date of Request: April 1, 1993
Date of NTC Concurrence:

Description of Problem:

Onsite: Loss of net income & productivity from sheet and rill erosion. Streambank erosion and flood damage to forest areas and cropland.

Offsite: Sedimentation & water quality impairments of Whitewater River & Weaver Bottoms. Flood damage to roads, bridges, parks, and recreation areas.

Project Effects of Most Likely Recommended Plan:

No. of Beneficiaries: 79,200
Participation Rate: 75% of untreated
Cost Share Rate: 65%
Approval Level: State Conservationist
Secretarial Exception: No

Acres Benefitted: 25,600
Federal Costs: $1,166,600
Local Costs: $1,568,100
Annual Benefits: $773,300
Annual Costs: $259,300

Name of Sponsors

Wabasha County Commissioners
Wabasha County Soil and Water Conservation District
Winona County Commissioners
Winona County Soil and Water Conservation District

These counties are represented on the Whitewater River Watershed Joint Powers Board (JPB) which is chaired by Eugene Kalmes. His address and phone number is:

Eugene Kalmes
Box 38
Lewiston, MN 55952

(507) 523-2171

The contact person for the project is:

Shelly Eckblad, Executive Director
Olmsted County SWCD
1485 Industrial Dr. NW, Rm.102
Rochester, MN 55901

(507) 289-6239

Estimated Starting Date: May, 1993
Plan Completion Date: October, 1995
SCS Planning Cost: $921,700.00 for all four subwatersheds

Existing Program Status:

Projects Under Construction:

Burnham Creek Watershed
South Zumbro Watershed
Kanaranzi-Little Rock Watershed

Project in Active Planning	Est. Cost	Author. Date	Status
Upper North Branch Root River	$2,060,000.00	July, 1987	Formal Review

Bear Creek (This project is being planned by Iowa)

Congressional Districts and Representatives:

First Congressional District:
The Honorable Timothy J. Penny
House of Representatives
436 Cannon Office Building
Washington, D. C. 20515

Senators:
The Honorable David Durenberger
154 Russell Office Building
Washington, D. C. 20510

The Honorable Paul Wellstone
702 Hart Office Building
Washington, D. C. 20510

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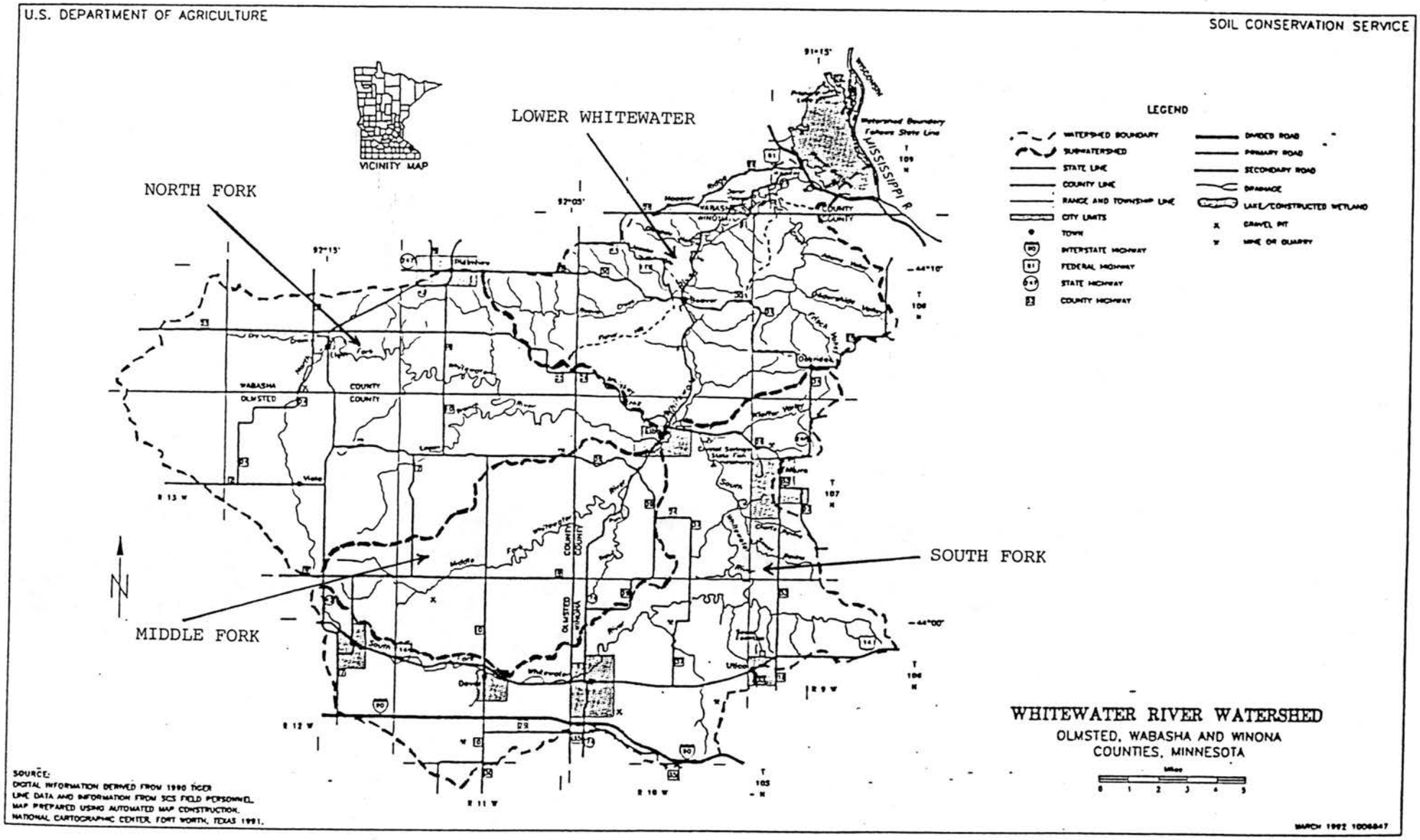
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OLMSTED, WABASHA AND WINONA
COUNTIES, MINNESOTA
SOURCE:
DIGITAL INFORMATION DERIVED FROM 1990 TIGER
LINE DATA AND INFORMATION FROM SCS FIELD PERSONNEL.
MAP PREPARED USING AUTOMATED MAP CONSTRUCTION.
NATIONAL CARTOGRAPHIC CENTER, FORT WORTH, TEXAS 1991.
MARCH 1992 1006847

Summary Fact Sheet

Request for Planning Authorization

Project: Middle Fork Whitewater River Watershed
State: Minnesota
Watershed Size: 36,800 acres
Date of Application: May, 1990; April, 1993

Watershed Project No. 9044
Counties: Olmsted and Winona
Date of Request: April 1, 1993
Date of NTC Concurrence:

Description of Problem:

Onsite: Loss of net income & productivity from sheet & rill erosion. Streambank erosion and flood damage to forest areas and cropland.

Offsite: Sedimentation & water quality impairments of Whitewater River and Weaver Bottoms. Flood damage to roads, bridges, parks, and recreation areas.

Project Effects of Most Likely Recommended Plan:

No. of Beneficiaries: 64,800
Participation Rate: 75% of untreated
Cost Share Rate: 65%
Approval Level: State Conservationist
Secretarial Exception: No

Acres Benefitted: 20,980
Federal Costs: $1,751,950
Local Costs: $1,598,550
Annual Benefits: $495,300
Annual Costs: $324,700

Name of Sponsors

Olmsted County Commissioners
Olmsted County Soil and Water Conservation District
Winona County Commissioners
Winona County Soil and Water Conservation District

These counties are represented on the Whitewater River Watershed Joint Powers Board (JPB) which is chaired by Eugene Kalmes. His address and phone number is:

Eugene Kalmes
Box 38
Lewiston, MN 55952

(507) 523-2171

The contact person for the project is:

Shelly Eckblad, Executive Director
Olmsted County SWCD
1485 Industrial Dr. NW, Rm.102
Rochester, MN 55901

(507) 289-6239

Estimated Starting Date: May, 1993
Plan Completion Date: October, 1995
SCS Planning Cost: $921,700.00 for all four subwatersheds

Existing Program Status:

Projects Under Construction:

Burnham Creek Watershed
South Zumbro Watershed
Kanaranzi-Little Rock Watershed

Project in Active Planning	Est. Cost	Author. Date	Status
Upper North Branch Root River	$2,060,000.00	July, 1987	Formal Review

Bear Creek (This project is being planned by Iowa)

Congressional Districts and Representatives:

First Congressional District:
The Honorable Timothy J. Penny
House of Representatives
436 Cannon Office Building
Washington, D. C. 20515

Senators:
The Honorable David Durenberger
154 Russell Office Building
Washington, D. C. 20510

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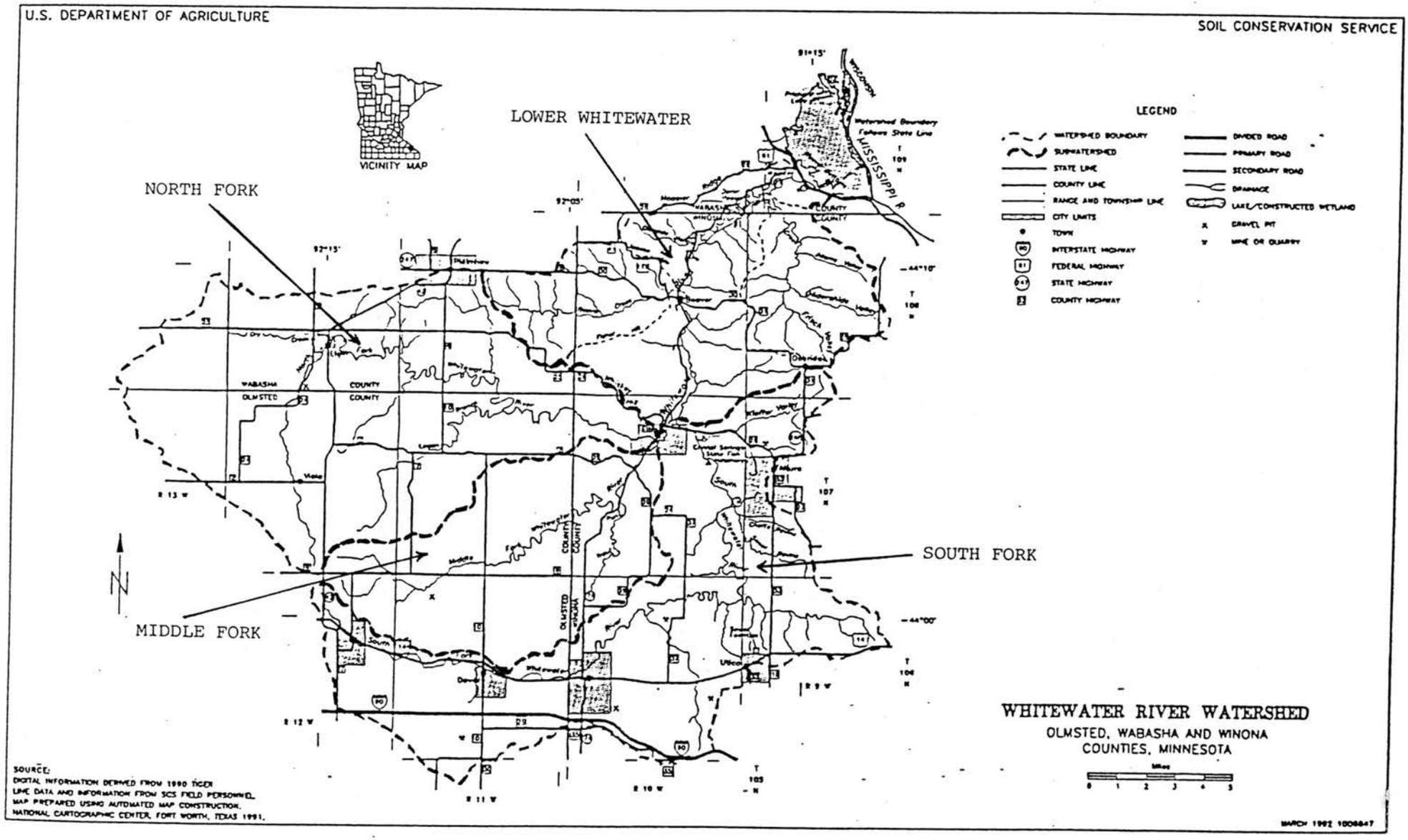
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MARCH 1992 1008647

Summary Fact Sheet

Request for Planning Authorization

Project: South Fork Whitewater River Watershed
State: Minnesota
Watershed Size: 58,400 acres
Date of Application: May, 1990; April, 1993

Watershed Project No. 9046
Counties: Olmsted and Winona
Date of Request: April 1, 1993
Date of NTC Concurrence:

Description of Problem:

Onsite: Loss of net income & productivity from sheet & rill erosion. Streambank erosion and flood damage to forest areas and cropland.

Offsite: Sedimentation & water quality impairments of Whitewater River, Crystal Springs Trout Hatchery, & Weaver Bottoms. Flood damage to roads, bridges, parks and recreation areas.

Project Effects of Most Likely Recommended Plan:

No. of Beneficiaries: 100,800
Participation Rate: 75% of untreated
Cost Share Rate: 65%
Approval Level: State Conservationist
Secretarial Exception: No

Acres Benefitted: 32,630
Federal Costs: $1,583,400
Local Costs: $2,393,500
Annual Benefits: $783,800
Annual Costs: $398,700

Name of Sponsors

Olmsted County Commissioners
Olmsted County Soil and Water Conservation District
Winona County Commissioners
Winona County Soil and Water Conservation District

These counties are represented on the Whitewater River Watershed Joint Powers Board (JPB) which is chaired by Eugene Kalmes. His address and phone number is:

Eugene Kalmes
Box 38
Lewiston, MN 55952

(507) 523-2171

The contact person for the project is:

Shelly Eckblad, Executive Director
Olmsted County SWCD
1485 Industrial Dr. NW, Rm.102
Rochester, MN 55901

(507) 289-6239

Estimated Starting Date: May, 1993
Plan Completion Date: October, 1995
SCS Planning Cost: $921,700.00 for all four subwatersheds

Existing Program Status:

Projects Under Construction:

Burnham Creek Watershed
South Zumbro Watershed
Kanaranzi-Little Rock Watershed

Project in Active Planning	Est. Cost	Author. Date	Status
Upper North Branch Root River	$2,060,000.00	July, 1987	Formal Review

Bear Creek (This project is being planned by Iowa)

Congressional Districts and Representatives:

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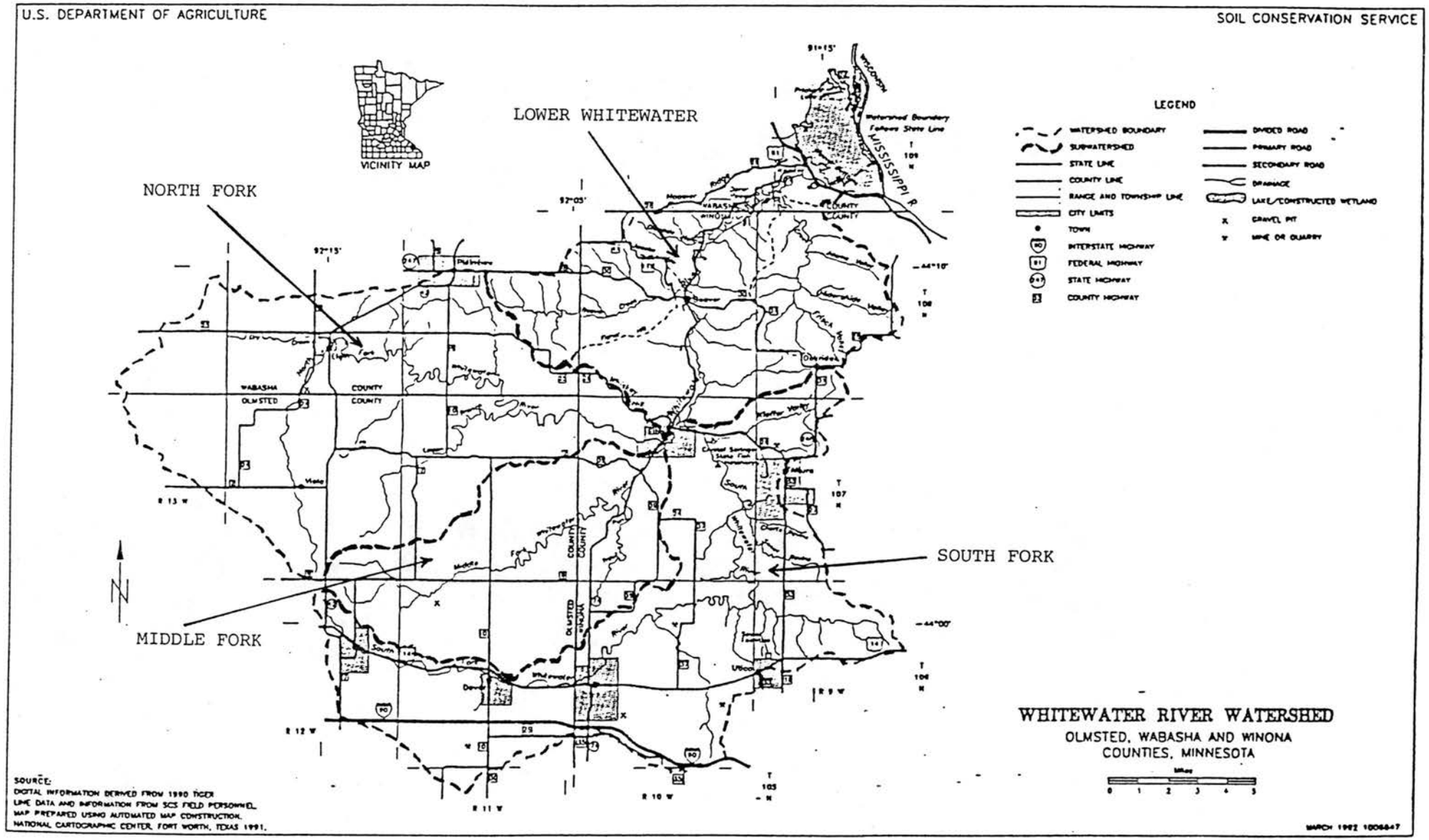
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MARCH 1992 1006847

Summary Fact Sheet

Request for Planning Authorization

Project: North Fork Whitewater River Watershed
State: Minnesota
Watershed Size: 64,600 acres
Date of Application: May, 1990; April, 1993

Watershed Project No. 9045
Counties: Olmsted, Wabasha and Winona
Date of Request: April 1, 1993
Date of NTC Concurrence:

Description of Problem:

Onsite: Loss of net income & productivity from sheet & rill erosion. Streambank erosion and flood damage to forest areas and cropland.

Offsite: Sedimentation & water quality impairments of Whitewater River and Weaver Bottoms. Flood damage to roads, bridges, parks and recreation areas.

Project Effects of Most Likely Recommended Plan:

No. of Beneficiaries: 115,200
Participation Rate: 75% of untreated
Cost Share Rate: 65%
Approval Level: State Conservationist
Secretarial Exception: No

Acres Benefitted: 37,300
Federal Costs: $4,852,700
Local Costs: $3,596,300
Annual Benefits: $802,500
Annual Costs: $789,700

Name of Sponsors

Olmsted County Commissioners
Olmsted County Soil and Water Conservation District
Wabasha County Commissioners
Wabasha County Soil and Water Conservation District
Winona County Commissioners
Winona County Soil and Water Conservation District

These counties are represented on the Whitewater River Watershed Joint Powers Board (JPB) which is chaired by Eugene Kalmes. His address and phone number is:

Eugene Kalmes
Box 38
Lewiston, MN 55952

(507) 523-2171

The contact person for the project is:

Shelly Eckblad, Executive Director
Olmsted County SWCD
1485 Industrial Dr. NW, Rm.102
Rochester, MN 55901

(507) 289-6239

Estimated Starting Date: May, 1993
Plan Completion Date: October, 1995
SCS Planning Cost: $921,700.00 for all four subwatersheds

Existing Program Status:

Projects Under Construction:

Burnham Creek Watershed
South Zumbro Watershed
Kanaranzi-Little Rock Watershed

Project in Active Planning	Est. Cost	Author. Date	Status
Upper North Branch Root River	$2,060,000.00	July, 1987	Formal Review

Bear Creek (This project is being planned by Iowa)

Congressional Districts and Representatives:

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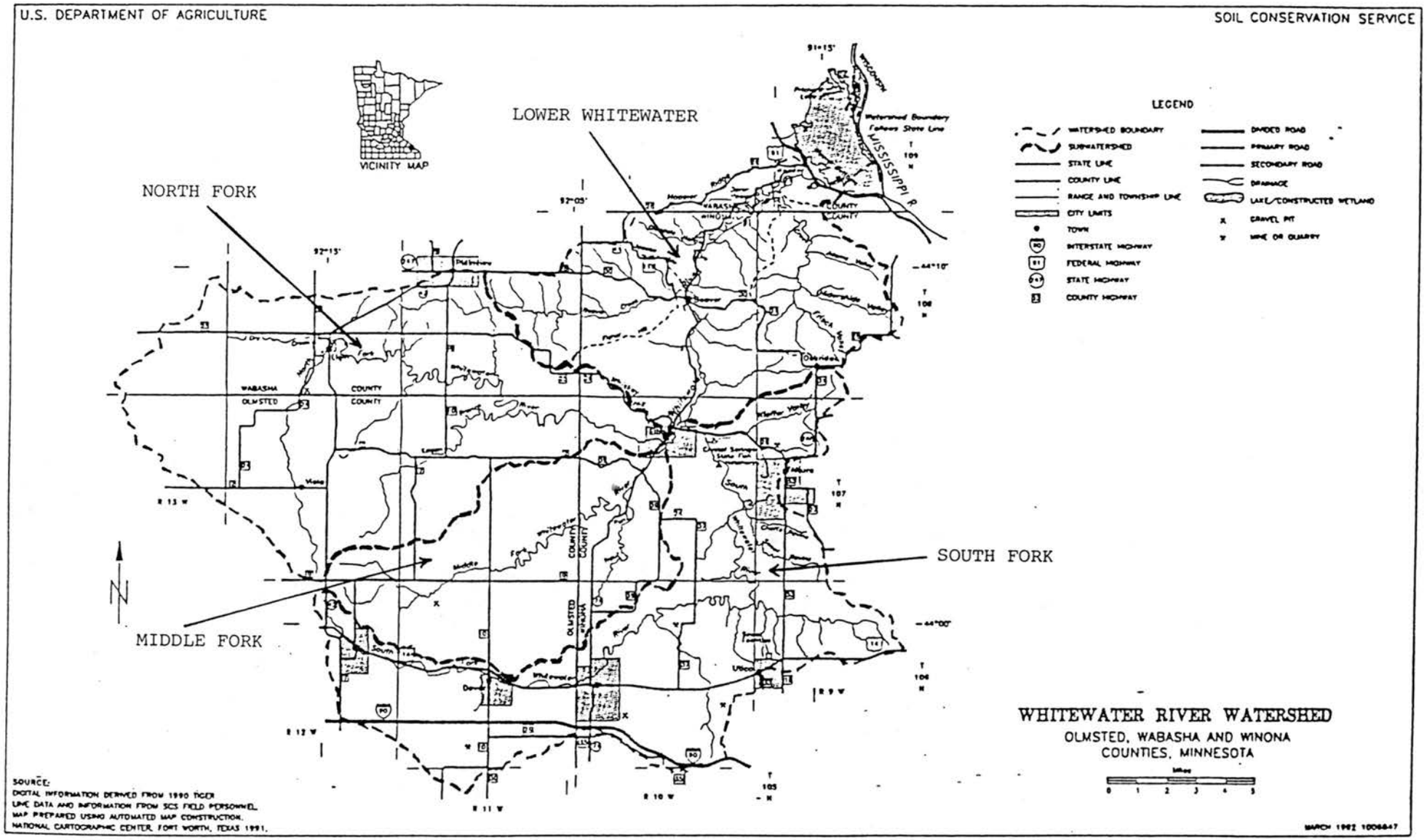
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LEGEND
WATERSHED BOUNDARY
SUBWATERSHED
STATE LINE
COUNTY LINE
RANGE AND TOWNSHIP LINE
CITY LIMITS
TOWN
INTERSTATE HIGHWAY
FEDERAL HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY
DIVIDED ROAD
PRIMARY ROAD
SECONDARY ROAD
DRAINAGE
LAKE/CONSTRUCTED WETLAND
GRAVEL PIT
MINE OR QUARRY
WHITEWATER RIVER WATERSHED
OLMSTED, WABASHA AND WINONA
COUNTIES, MINNESOTA
SOURCE:
DIGITAL INFORMATION DERIVED FROM 1990 TIGER
LINE DATA AND INFORMATION FROM SCS FIELD PERSONNEL.
MAP PREPARED USING AUTOMATED MAP CONSTRUCTION.
NATIONAL CARTOGRAPHIC CENTER, FORT WORTH, TEXAS 1991.
MARCH 1992 1006847

Adopted

BOARD OF WATER AND SOIL RESOURCES
KELLY INN
161 ST. ANTHONY STREET
ST. PAUL, MINNESOTA
APRIL 28, 1993

APPOINTED MEMBERS PRESENT

Jim Nielsen, Jim Rossman, Don Ogaard, Dwain Otte, Sharon Clark, Ted Lovdahl, Barbara Uppgaard, Barbara Cobb, Kathleen Roer, Warren Rodning, Howard Peterson, and John Boulton.

AGENCY MEMBERS PRESENT

Wayne Edgerton, Department of Natural Resources (DNR)
Wayne Anderson, Pollution Control Agency (PCA)
Elton Redalen and Paul Burns, Department of Agriculture (MDA)
Fred Bergsrud, U of M/Extension Services (MES)
Kim Benson-Johnson, Department of Health (MDH)

OTHERS PRESENT

D'Wayne DeZiel and Bob Pigeon, Minnesota Association of Soil & Water Conservation Districts (MASWCD)
Pat Wulff, Minnesota Lakes Association (MLA)
Curt Borchert, Minnesota Association of Conservation District Employees (MACDE)
Eugene Kalmes and Shelly Eckblad, Whitewater Project
Tim Koehler, Soil Conservation Service (SCS)

STAFF PRESENT

Ron Harnack
Jim Birkholz
Doug Thomas
Pete Waller
Jim Haertel
Barbara Cobb
Susan Tsakakis
Al Kean
Dave Behm
Chuck Niska
Mary Jo Anderson

Meeting Called to Order - Chairman Nielsen called the meeting to order at 9:00 a.m.

** 93-14 **Adopt Agenda** - Moved by Rossman, seconded by Cobb, to adopt the agenda as presented. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-15 **Minutes of March 24, 1993** - Howard Peterson stated that Al Dornfeld's name needs to be added to the attendance roster on page one of the minutes. Moved by Rossman, seconded by Roer, to approve the minutes of March 24, 1993, as circulated. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Chairman's Report - Chairman Nielsen reported that agency heads of the MDA, DNR, and PCA met yesterday regarding feedlot issues. Chairman Nielsen stated that the feedlot issue is being stonewalled. Wayne Anderson, PCA, asked Chairman Nielsen to clarify his comment. Chairman Nielsen responded that an open dialogue is a stonewalling tactic by PCA. Ron Harnack responded that there are ongoing meetings being held regarding feedlot issues, permitting, enforcement, etc., and there is progress being made. Wayne Edgerton stated that a list of feedlot violators has been compiled; those violators are under investigation by the Attorney General's Office, and the list is kept confidential. Chairman Nielsen stated that agencies should be in a position to work cooperatively on this issue; why make criminals out of feedlot violators.

Chairman Nielsen stated that BWSR hasn't played a big part in the Sustainable Development Process. D'Wayne DeZiel stated that he would like to see the BWSR at those meetings. Chairman Nielsen said that staff have been assigned to task forces including the Sustainable Ag Task Force, and if any members are interested in this they should contact Jim Nielsen or Ron Harnack. Barbara Uppgaard said that BWSR should state where they fit in rather than wait to hear from them; BWSR needs to be proactive. May 10 is the next meeting date of the Sustainable Ag Task Force.

Executive Director's Report - Ron Harnack stated that the Board Member Update has been distributed for members information. He gave a brief budget update on the Minnesota River initiative in RIM. The Senate reduced the wetlands budget by $500,000 per year. The budget looks pretty good in the House.

Ron updated the BWSR on Legislative issues. The wetlands bill is still going through on the floor. Ron foresees the legislature adjourning by May 10.

Don Ogaard briefly reported on the BWSR's Soil Loss Committee. The committee met last night and discussed the model ordinance. The committee will resume meeting with agency

committees. Their next meeting is scheduled for May 28.

Richfield/Bloomington WMO Boundary Change - Jim Haertel met with the Dispute Resolution Committee (DRC) and approved the facts, findings, and conclusion of the Richfield/Bloomington WMO boundary change; the DRC recommends approval of the boundary change. Moved by Peterson, seconded by Lovdahl, to accept the DRC's recommendation to approve the Richfield/Bloomington WMO boundary change. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-16

Howard Peterson summarized the Rice Creek Watershed District issue. Rice Creek ordered a project hearing and Fridley will, without prejudice, withdraw their appeal.

Snake River Joint Powers Agreement (JPA) - Doug Thomas reported that staff attended a Snake River JPA meeting on April 8, 1993. The purpose of the meeting was to present recommended changes to the agreement based on board member input since the March 24, 1993, BWSR meeting. The JPA members accepted changes recommended. Doug Thomas recommended approval of the JPA. Moved by Cobb, seconded by Uppgaard, that the BWSR accept the JPA as adequate and instruct staff to work with the petitioners to withdraw the petition for establishment of the Snake River Watershed District; and direct staff to establish an annual review of the Snake River Joint Powers Board, with the first report to be done in January of 1994. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed. None. Carried. Dwain Otte suggested that staff report to the BWSR in October on how this is progressing rather than wait until the first review in January. Staff was directed to do so. Cobb commended Doug Thomas and everyone who has been involved in the situation, for their time and efforts in developing an excellent joint powers agreement.

** 93-17

Assignment of Lands/Areas to Specific Water Planning Entities - Jim Haertel explained that the Metropolitan Watershed Management Act (Act) was amended in 1990 to require watershed management plans for areas that were formerly exempt from planning in the seven-county metro area (M.S. 103B.205 to 103B.255). A policy determination should be made on whether a few small metro areas on the fringe of the seven-county metro area should be allowed to meet the watershed management planning requirement by being included in an adjacent non-metro county's local water plan (LWP) or be required to plan under the Metro Act. The areas of concern are the cities of Rockford and Hanover; a large portion of each city is in Wright County and a small portion is in Hennepin County. The areas of each city in Wright County are in the Wright County local water plan. Rockford and Hanover desire to include their entire city in the Wright County local water plan. If not allowed, other options would be for each city to prepare a plan under the Act for at

least the area of Hennepin County, or join a neighboring water management organization or watershed district. Jim stated that staff has been in consultation with Bill Clapp, special assistant attorney general, on this issue, and it's their opinion that the BWSR make the policy determination. The staff recommendation is to allow watershed management planning in these small metro fringe areas under the adjacent county's local water plan, the cities of Rockford and Hanover to remain in the Wright County local water plan. Moved by Otte, seconded by Roer, to accept the staff recommendation to allow Rockford and Hanover to remain in the Wright County local water plan. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-18

Chairman Nielsen called for a break in the meeting at 9:55 p.m. The meeting reconvened at 10:15 a.m.

Whitewater Watershed Project - Ron Harnack introduced Eugene Kalmes and Shelly Eckblad, Whitewater Project representatives, and Tim Koehler, SCS. Eugene reported that the Whitewater Project started in 1987. Shelly explained that the Whitewater Project is in Olmsted, Wabasha, and Winona Counties, and membership of the project board includes three county commissioners and three SWCD supervisors. Tim distributed an SCS reference document, "Water Resources Projects Status Report," for the Board's information. They are asking the BWSR to consider Four Watershed Units as a high priority with intent to work with the Joint Powers Board. Tim explained that they are not asking the BWSR for anything different from their original request. Discussion followed. Moved by Rossman, seconded by Otte, that the BWSR approve the PL566 applications for the Whitewater Watershed Project (four subwatersheds) as a high priority. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-19

Chairman Nielsen introduced Dick Jackson, Mille Lacs County commissioner, who just arrived. Mr. Jackson thanked the BWSR for their approval of the Snake River Joint Powers Agreement.

Soil Conservation Service (SCS) Report - Tim Koehler explained that Gary Nordstrom is in Kansas City today for a meeting. Tim reported that the administrative proposal for the 1994 budget was sent to Washington, D.C., for Congress to consider.

Tim stated that there's a proposal to restructure three agencies, SCS, Farmers Home Administration (FmHA), and the Agricultural Stabilization and Conservation Service (ASCS) and combine them into one, the Farm Services Agency. Tim reported that a decision has not yet been made regarding Senator Madigan's proposal to close offices.

Ron Harnack suggested that the BWSR send a letter to the Minnesota congressional delegation regarding the "Farm Services Agency" - restructuring of the U.S. Department of Agriculture. Chairman Nielsen suggested that a presentation by SCS, ASCS, FmHA and staff of the congressional delegation be made at the May meeting regarding this issue. Ron reported that Wally Sparby has been appointed as the new chief of ASCS.

Don Ogaard reported that he will give a slide presentation at the May meeting regarding Red River projects and the Red River Watershed District's annual report.

Chairman Nielsen introduced representatives of the Lake Association, Donna Strusinski, Clare Frebo and Lloyd Marier; and commended them for their diligence. They briefly commented on their appreciation of the BWSR's action today regarding the Snake River Joint Powers Agreement.

Feedlot Cost-Share Policy Relating to Enforcement Actions - Jim Rossman explained that the BWSR had requested the Feedlot Committee to review options to allow cost-share for feedlots when enforcement action had been taken by DNR or PCA. Five options were reviewed and the committee preferred Option #5. Barbara Cobb asked Wayne Anderson, PCA, what his thoughts were on Option #5. He stated that it's adequate and he's willing to see it work. Paul Burns, MDA, thinks Option #5 is consistent with Commissioner Elton Redalen's perspective and that it send a strong signal. Discussion followed. The committee agreed to add the word "formal" to enforcement in the last paragraph, and to change the word "landowner" to "feedlot owner." Moved by Rossman, seconded by Lovdahl, to adopt Option #5 of the Feedlot Cost-Share Policy Relating to Enforcement Actions as follows:

** 93-20

WHEREAS, the State of Minnesota has made available, through the Cost-Share Program administered by the Board of Water and Soil Resources, funding for the purpose of sharing in the costs of installing manure management systems which will prevent or minimize the degradation of water and soil resources and protect the public health; and

WHEREAS, feedlot owners or operators participating in the Cost-Share Program are expected to act in good faith to comply with all applicable state and local government resource protection rules and ordinances; and

WHEREAS, the current Cost-Share Program rules are silent regarding the eligibility of feedlot owners or operators who knowingly violate these rules and ordinances.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with soil and water conservation districts, counties and appropriate state agencies to determine the eligibility of feedlot owners or operators for Cost-Share Program funding of manure management systems on a case-by-case basis where formal enforcement actions have been taken,

considering the environmental and legal facts of the situation, as well as the feedlot owner's demonstration of good faith.

Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Ogaard, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Future Meetings - Ron Harnack stated that members need to look at upcoming BWSR meeting dates and schedule accordingly. It was decided to meet on the following dates: May 26; June 25-26 in conjunction with MAWD meeting and tour; no meeting in July; August 25; September 22 meeting and tour in Itasca County; October 27; combine the November/December meeting and meet December 8.

Advisor Comments

-Minnesota Association of Soil and Water Conservation Districts (MASWCD): D'Wayne DeZiel reported that the National Association of Conservation Districts (NACD) will hold their North Central Leadership Session in Duluth, July 11-14, 1993. The NACD North Central Urban Symposium is scheduled for November 7-10 in Minneapolis. D'Wayne stated that MASWCD has been spending a lot of time on the SCS restructuring issue.

-Minnesota Association of Conservation District Employees (MACDE): Curt Borchert, the district manager in Norman County SWCD, reported that he had been appointed as a director of MACDE. Curt will be attending BWSR meetings.

-Minnesota Lake Association (MLA): Pat Wulff thanked BWSR for their contribution to the MLA for their fall conference. MLA has recently received a grant for $51,000 over a two-year period from the Environmental Protection Agency (EPA). Pat reported that MLA is taking part in the MES Master Gardener Program; this is a good working experience with MES.

-Minnesota Association of Watershed Districts (MAWD): Howard Peterson reported that the MAWD meeting and tour materials for their summer tour will be distributed soon -- dress comfortably for the tour. Howard recognized the Minneapolis "Star and Tribune" for their article on rule writing.

Chairman Nielsen adjourned the meeting for lunch at 11:55 a.m. The meeting reconvened at 1:00 p.m.

Jim Birkholz will be sitting in for Ron Harnack this afternoon, as Ron will be at the Capitol. Don Ogaard had another meeting to attend so he will be out this afternoon. Kim Benson-Johnson, MDH, entered the meeting at 1:10 p.m.

Tim Gramm Conservation Easement - Al Kean explained that two years ago the Department of Agriculture released sale of land to Tim Gramm with a conservation easement relating to highly erodible land. Tim Gramm has requested release from the easement. BWSR staff, MDA staff, Attorney General's Office, and Senator Charlie Berg have met with Tim Gramm to discuss this issue. During this meeting, there was general support for a conditional release from the easement. Wayne Edgerton, DNR, stated that questions and concerns regarding the easement pertain to the RIM rules. Paul Burns, MDA, responded that enforcement of the easement is not up to MDA. Discussion followed. Jim Birkholz stated that staff and the Attorney General's Office will look into this, whether or not the BWSR has the authority or who is responsible for this. Elton Redalen suggested delaying action on this until further information is obtained. Chairman Nielsen directed staff to assist Mr. Gramm where possible. Chairman Nielsen asked what jurisdiction does the BWSR have, is it possible to develop a substitute plan for the easement, and what are
** the penalties involved? Moved by Lovdahl, seconded by Rodning, that staff directed to
93-21 research and find answers to: 1) what jurisdiction does BWSR have? 2) is it possible to develop a substitute plan for the easement? and 3) what are the penalties involved? regarding the Tim Gramm easement. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried. Jim Rossman stated that Mr. Gramm needs to be notified that cropping that easement is not a good idea.

** Moved by Otte, seconded by Clark, that staff directed to investigate M.S. 103F.535 - are they
93-22 under jurisdiction rule? Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Continuation of the BWSR/MES Education Position and Partnership - Sharon Clark distributed a letter she planned to send to Senator Lawrence Pogemiller regarding the BWSR's support for continued funding of the environmental education effort. Fred Bergsrud, MES, stated that Barbara Liukkonen's position has been very beneficial and Dr. Pat Borich has also been very positive regarding this position. Susan Tsakakis gave background information, and reported on the activities that Barb has been involved in the past six months. The BWSR Education Committee's recommendation is to extend the position for the biennium. Pat Wulff commended Barbara's work and said she appreciated the BMP sheets Barbara had developed and stated how helpful the sheets are to realtors and lake associations. Chairman Nielsen suggested that the efforts of BWSR be heightened;
** and we should take more credit for what we're doing. Moved by Clark, seconded by
93-23 Lovdahl, to continue the BWSR/MES education position for the upcoming fiscal year 1994-1995 biennium. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried. Sharon Clark proposed an education position in southern Minnesota. Fred Bergsrud explained that MES has a water quality position in southeastern Minnesota. He stated that possibly BWSR and MES could

jointly go to the Legislature for funding additional positions, including a third position in the metro area. A meeting has been scheduled for May 25 to discuss this issue further. Jim Rossman stated that he endorses this proposal. Chairman Nielsen thanked the Education Committee for their efforts, and especially appreciated the exemplary, highly motivated, excellent report made by Susan Tsakakis!

Local Water Planning Challenge Grants - Chuck Niska summarized the Local Water Resources Protection and Management Program and also gave a brief synopsis of the local water planning challenge grant proposal. Chuck stated that approval is needed to make the grants; the grant agreements are available to send out now with funding to be sent out in two to three months. Discussion followed. Moved by Rodning, seconded by Boulton, to approve the staff recommendation for disbursement of the Local Water Resources Protection and Management Program challenge grant requests. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

** 93-24

Chairman Nielsen announced that Chuck Niska is leaving BWSR, effective today, and going to DNR to work with their federal grant program. Dwain Otte expressed his appreciation for Chuck's assistance at BWSR. Chairman Nielsen asked Chuck to leave a note to his successor to tell members what the criteria is for the programs and also a justification for each project.

Cost-Share Program Allocation Process/Request for Change - Dave Behm explained the need for revision of the Cost-Share Program rules. Staff asked for BWSR endorsement and will come before the BWSR again at the May meeting with greater detail. Chairman Nielsen suggested that staff prepare a summary of the current rules showing an abstract comparison of the changes to be made and to present this information at the May or June meeting.

Chairman Nielsen commended Dave Behm for his attendance at the meetings with Elton Redalen.

Fred Bergsrud distributed copies of the publication "Clean Water" for the BWSR's information.

Chairman Nielsen distributed copies of the "Kiplinger Agriculture Letter" for members information.

** 93-25 Moved by Boulton, seconded by Peterson, to adjourn the meeting at 2:50 p.m. Affirmative: Boulton, Clark, Cobb, Lovdahl, Peterson, Otte, Rodning, Roer, Rossman, Uppgaard, and Nielsen. Opposed: None. Carried.

Respectfully submitted,

D. James Nielsen
Chairman

WATER RESOURCE PROJECTS STATUS REPORT

United States Department of Agriculture

SOIL CONSERVATION SERVICE

OCTOBER 1992

WATER RESOURCES STAFF TEAM MISSION STATEMENT
SCS MINNESOTA
TO PROVIDE HIGH QUALITY PLANNING ASSISTANCE TO OUR CUSTOMERS FOR PROTECTION, ENHANCEMENT, AND CONSERVATION OF WATER AND LAND-RELATED RESOURCES CONSISTENT WITH LOCAL, STATE, AND NATIONAL OBJECTIVES.

All programs and services of the U. S. Department of Agriculture, Soil Conservation Service, are offered on a nondiscriminatory basis without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

FOREWORD

In recent years several changes have occurred in USDA that have changed the priorities of the watershed program. Implementation of the Food Security Act of 1985 (FSA) has caused the greatest change. SCS has taken several steps to meet the FSA and USDA goal of redirecting the watershed program to (1) reduce future obligations, (2) reduce the production of surplus crops, (3) reduce commodity payments and, (4) reduce the production of crops on highly erodible lands.

Priority is therefore given to watershed plans that demonstrate the following:

1. Produce significant offsite benefits such as improved water quality, water conservation and/or a reduction in flood or sedimentation.

2. Strengthen the role of state and local agencies in addressing their water and related land resource problems.

3. Help state and local government develop programs that establish objectives, identify water resource problems and set priorities for action.

4. Include significant planning involvement of state and local agencies. Involvement may include local funding, participation in planning and willingness to implement study findings.

5. Identify and benefit disadvantaged groups.

This summary has been prepared to reflect the current status of Public Law 83-566 watershed program, river basin studies, and flood hazard studies in Minnesota. It provides information about each watershed project for which an application has been received. Any questions concerning information contained in this report should be directed to personnel on page 3.

Gary R. Nordstrom

GARY R. NORDSTROM
State Conservationist

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WATERSHED PROGRAM IN MINNESOTA

Background

In Minnesota the P.L. 566 program, commonly called the Small Watershed Program, helps protect, manage, improve, and develop the water and related land resources of watersheds up to 250,000 acres in size. It is based on (1) local initiative and responsibility, (2) Federal technical and cost-sharing assistance, and (3) state review and approval of local proposals for state financial and other assistance. The program has six major purposes: watershed protection; flood prevention; agricultural water management including public recreation, fish and wildlife, municipal and industrial water supply, and water quality management; energy; groundwater recharge; and conservation and proper use of land, including control of agriculture-related pollution and disposal of solid waste. The program provides funding for planning and installing land treatment, structural, and nonstructural measures.

Congress authorized the program in 1954 under the Watershed Protection and Flood Prevention Act, Public Law 83-566 (P.L. 566) as amended (16 U.S.C. 1001-1008). From 1954 through 1987, over ten amendments have been made to the law and sixteen laws have been passed that have affected the planning and implementation of P.L. 566 Watershed Projects. New national direction emphasizes PL-566 watershed planning can be done and implemented for any source of funding.

How the Program Works

All P.L. 566 small watershed planning will entail the following steps:

1. Preapplication consideration. Before planning activities can proceed, a request must be received from a local eligible sponsor. During this preapplication phase, a multiagency team will determine whether there is enough offsite damages, benefits, and local agency and public support to proceed. Enough field work will be done to determine the potential feasibility of the project, its impact to the environment and cultural resources, as well as meeting the eligibility requirements for planning assistance. Appropriate federal and state agencies, local organizations, and the public will be notified of the potential application. Data collected during the preapplication phase should be useful to local organizations to help them decide if they should submit an application and also be helpful in the application preparation.

2. Sponsors apply for assistance. Any local nonprofit organization having the authority, under state law, to develop and carry out a watershed project can be a sponsor. Eligible sponsors include soil and water conservation districts; municipalities; counties; watershed, flood-control, conservancy, drainage, irrigation, or other special-purpose districts; and irrigation and reservoir companies. The application is filed with the state agency designated to approve watershed applications (Minnesota Board of Water and Soil Resources).

3. State reviews application. The state approves or disapproves applications and determines their priority status. To warrant high-priority status, the application generally must convince the state that (a) the sponsors intend to meet their commitments in carrying out and maintaining the project, (b) that progress has been or is being made in

applying soil and water conservation on individual farms and ranches, (c) that the proposed project will benefit a substantial number of people, and (d) that it has the support of people throughout the watershed.

4. SCS reviews application. When SCS is able to furnish planning assistance, it reviews the applications given highest priority by the state. SCS conducts a field examination of the watershed to determine the potential for an acceptable watershed plan, the probable alternative plans to be investigated and the probable impact of each alternative.

5. SCS and sponsors plan the project. After the SCS Chief authorizes planning assistance, a multiagency interdisciplinary team works with local representatives to scope the project, to make environmental assessments and to help the sponsors develop a watershed plan. Representatives of state and other federal agencies often are involved. The team prepares a planning document that explains the benefits, costs, and environmental impact of the project and the alternatives considered according to established guidelines.

6. Congress or SCS approves plan. Only after careful review of the plan and environmental documentation by government officials at all levels, and by the public, can the federal government approve a small watershed project plan for the federal portion of the project funding. Depending on the amount of federal funding assistance involved, approval is made by the SCS State Conservationist, by the SCS Chief, or by Congress. Other agencies, organizations, and individuals will also be requested to support the project technically and financially.

7. Plan is implemented. The federal government gives technical help in installing some of the project measures, pays the full cost of construction for flood prevention, and shares the cost for other purposes. To help sponsoring organizations finance their share of the cost, the Farmers Home Administration (FmHA) may lend a maximum of ten million dollars per project for a maximum of 50 years. To develop water supply for future municipal or industrial use, the federal government may advance funds amounting to a maximum of 30 percent of the cost of a multipurpose reservoir and may defer payment for a maximum of 10 years without interest. In Minnesota various opportunities exist from state, federal, and other organizations for planning and implementation funding.

   Major obligations of local sponsors are to acquire land, easements, and rights-of-way; award contracts for construction on private land or delegate contracting to SCS; and share the construction cost of certain measures.

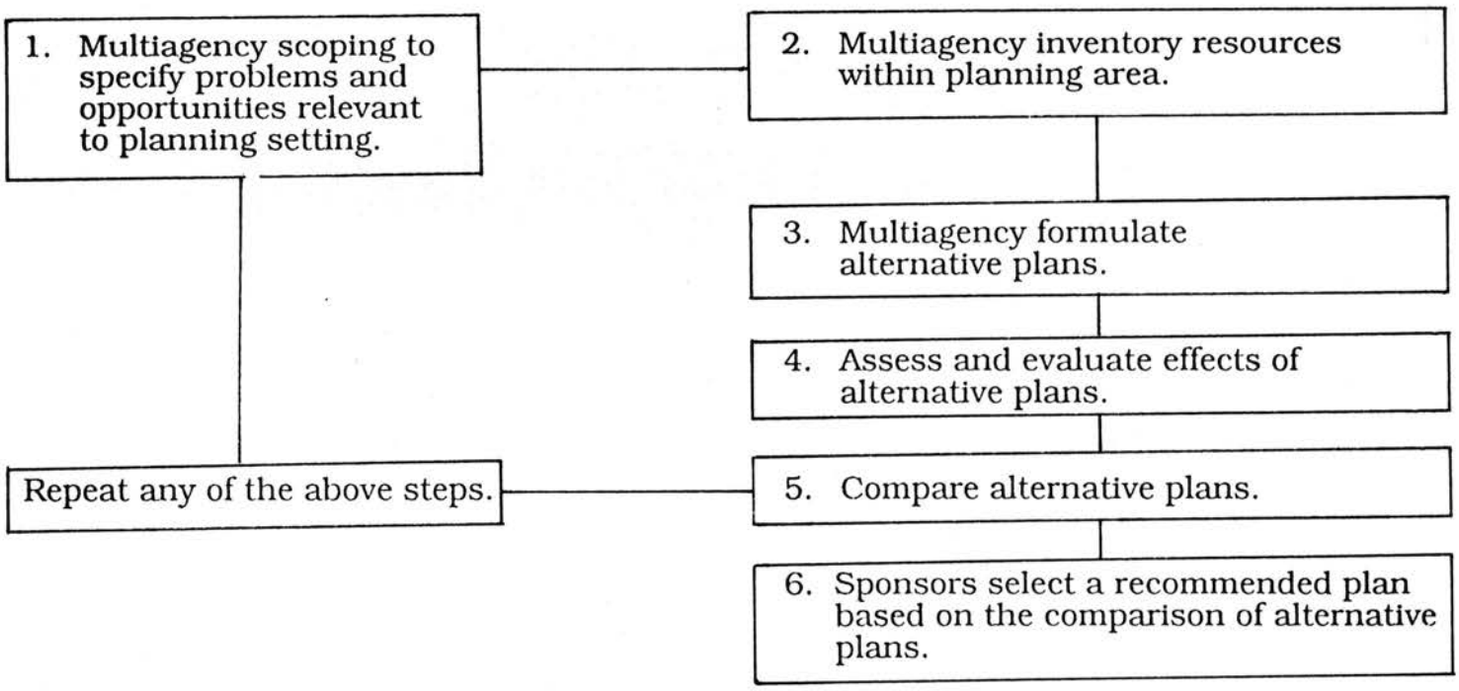
8. Operation and maintenance. Local sponsors assume responsibility for operating and maintaining the completed project.

Planning Process

The Water Resources Council's Principles and Guidelines (P&G) are followed to ensure proper and consistent planning in the formulation and evaluation of federally funded projects. The Principles and Guidelines specify that the federal objective of water and related land resources project is to contribute to national economic development consistent with protection of the nation's environment. The process involves an orderly and systematic approach to making determinations and decisions so that the interested public and decision makers can be fully aware of the basic assumptions employed, the data and information analyzed, the areas of risk and uncertainty, the reasons and rationales used, and the significant implication of each alternative plan. Project plans developed for funding from other sources are not required to follow P&G's.

The planning process consists of the following major steps that identify or respond to problems and opportunities associated with the federal objectives and specific state and local concerns:

PLANNING PROCESS PHASES



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The following list shows each active watershed's map number (see Watershed Status Map) and the page of this report to refer to for more details on each watershed.

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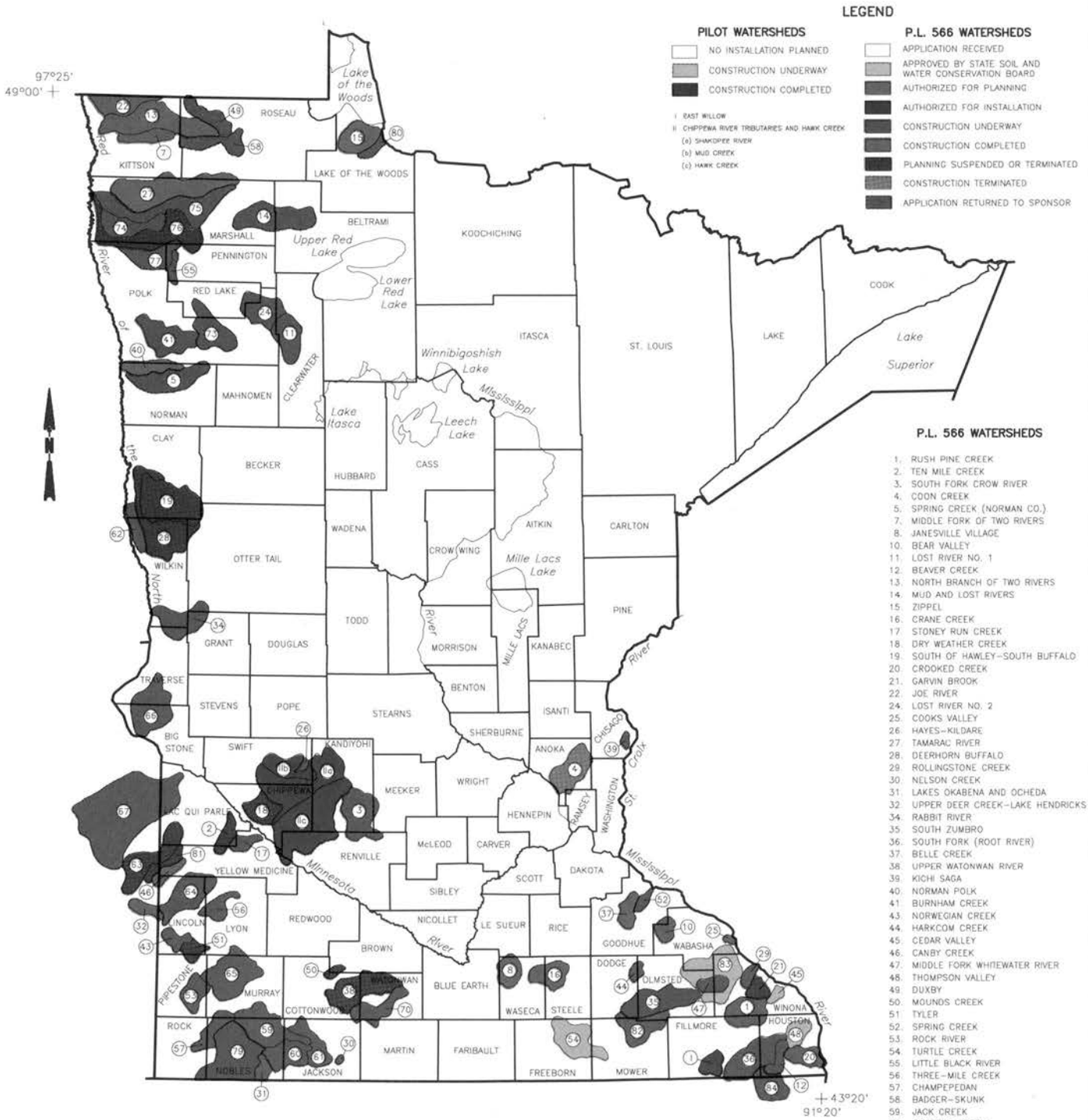
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



P.L. 566 WATERSHEDS

1. RUSH PINE CREEK
2. TEN MILE CREEK
3. SOUTH FORK CROW RIVER
4. COON CREEK
5. SPRING CREEK (NORMAN CO.)
7. MIDDLE FORK OF TWO RIVERS
8. JANESVILLE VILLAGE
10. BEAR VALLEY
11. LOST RIVER NO. 1
12. BEAVER CREEK
13. NORTH BRANCH OF TWO RIVERS
14. MUD AND LOST RIVERS
15. ZIPPEL
16. CRANE CREEK
17. STONEY RUN CREEK
18. DRY WEATHER CREEK
19. SOUTH OF HAWLEY-SOUTH BUFFALO
20. CROOKED CREEK
21. GARVIN BROOK
22. JOE RIVER
24. LOST RIVER NO. 2
25. COOKS VALLEY
26. HAYES-KILDARE
27. TAMARAC RIVER
28. DEERHORN BUFFALO
29. ROLLINGSTONE CREEK
30. NELSON CREEK
31. LAKES OKABENA AND OCHEDA
32. UPPER DEER CREEK-LAKE HENDRICKS
34. RABBIT RIVER
35. SOUTH ZUMBRO
36. SOUTH FORK (ROOT RIVER)
37. BELLE CREEK
38. UPPER WATONWAN RIVER
39. KICHI SAGA
40. NORMAN POLK
41. BURNHAM CREEK
43. NORWEGIAN CREEK
44. HARKCOM CREEK
45. CEDAR VALLEY
46. CANBY CREEK
47. MIDDLE FORK WHITEWATER RIVER
48. THOMPSON VALLEY
49. DUXBY
50. MOUNDS CREEK
51. TYLER
52. SPRING CREEK
53. ROCK RIVER
54. TURTLE CREEK
55. LITTLE BLACK RIVER
56. THREE-MILE CREEK
57. CHAMPEPEDAN
58. BADGER-SKUNK
59. JACK CREEK
60. OKABENA CREEK
61. HERON LAKE
62. COMSTOCK COULEE
63. FLORIDA CREEK
64. UPPER YELLOW MEDICINE
65. DES MOINES RIVER HEADWATERS
66. WEST BRANCH OF THE MUSTINKA
67. YELLOW BANK RIVER
70. SOUTH FORK WATONWAN
73. BADGER CREEK
74. MELGAARD-SWIFT COULEE
75. MIDDLE RIVER
76. SNAKE RIVER
77. ANGUS-OSLO
79. KANARANZI-LITTLE ROCK
80. BOSTIC CREEK
81. LAZARUS CREEK
82. UPPER NORTH BRANCH ROOT RIVER
83. WHITEWATER RIVER
84. BEAR CREEK

WATERSHED PROTECTION AND FLOOD PREVENTION MINNESOTA

OCTOBER 1992

Approximate Scale—Miles

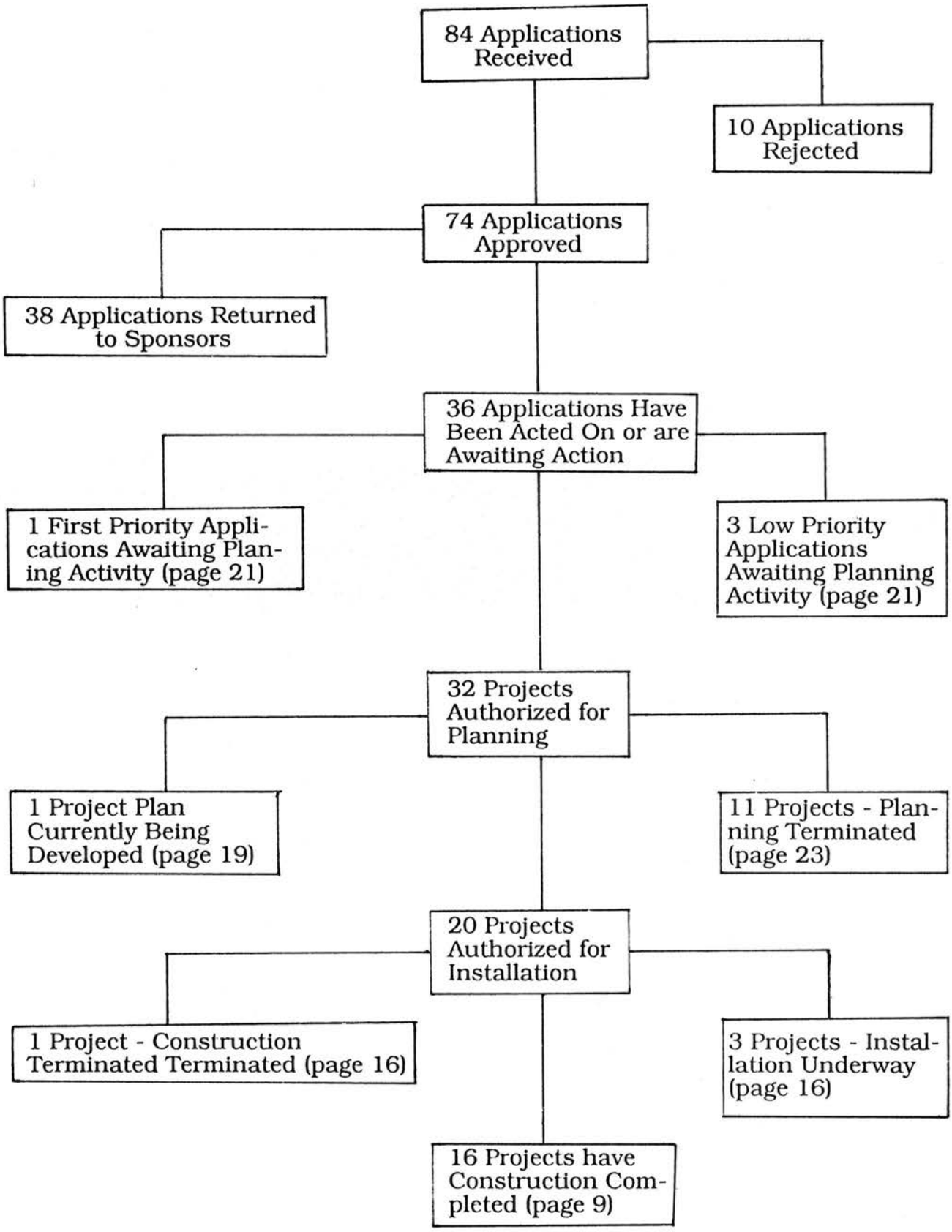
0 25 50 75 100

SOURCE:
INFORMATION FROM SCS FIELD PERSONNEL.
MAP PREPARED USING AUTOMATED MAP CONSTRUCTION.
ALBERS EQUAL AREA PROJECTION.
NATIONAL CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS CENTER, FORT WORTH, TEXAS, 1992.

REVISED JULY 1992 1000159

USDA-SCS-NATIONAL CARTOGRAPHIC CENTER, FT. WORTH, TX.-1992

SUMMARY OF MINNESOTA P.L. 566 WATERSHED PROJECTS



PROJECTS WITH CONSTRUCTION COMPLETED - 16

Bear Valley - Goodhue and Wabasha Counties

Belle Creek - Goodhue County

Canby Creek - Yellow Medicine and Lincoln Counties

Cooks Valley - Wabasha County

Crane Creek - Steele and Waseca Counties

Crooked Creek - Houston County

Janesville Village - Waseca, Blue Earth, and Le Sueur Counties

Joe River - Kittson County

Lakes Okabena and Ocheda - Nobles County

Middle Fork of Two Rivers - Kittson County

Norman - Polk - Norman and Polk Counties

North Branch of Two Rivers - Kittson and Roseau Counties

Rush Pine - Fillmore, Houston, and Winona Counties

Tamarac River - Marshall, Kittson, and Roseau Counties

Upper Deer Creek - Lake Hendricks - Minnesota Portion, Lincoln County

Zippel - Lake of the Woods County

Bear Valley (Goodhue and Wabasha Counties) - Map #10

Sponsors: Goodhue Soil and Water Conservation District
Wabasha Soil and Water Conservation District
Bear Valley Watershed District

Size: 29,326 acres

Authorized for Planning: April 21, 1959

Approved for Operations: May 11, 1961

Construction Started: March 7, 1963

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$237,278
B.	Other	86,530
	Total	$323,808

Completion Date: May 15, 1969

Measures Installed: 10 grade-stabilization structures

Belle Creek (Goodhue County) - Map #37

Sponsors: Goodhue Soil and Water Conservation District
Goodhue County Board of Commissioners
Belle Creek Watershed District

Size: 52,790 acres

Authorized for Planning: August 20, 1965

Approved for Operations: March 16, 1972

Construction Started: September 20, 1976

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$3,772,300
B.	Other	900,000
	Total	$4,672,300

Completion Date: October 11, 1985

Measures Installed: 5 floodwater retarding structures and two grade-stabilization structures

Canby Creek (Yellow Medicine and Lincoln Counties) - Map #46

Sponsors: Lac qui Parle - Yellow Bank Watershed District
Lincoln Soil and Water Conservation District
Yellow Medicine Soil and Water Conservation District

Size: 20,150 acres

Authorized for Planning: July 15, 1968

Approved for Operations: April 20, 1976

Construction Started: November 5, 1980

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$5,069,600
B.	Other	1,698,100
	Total	$6,767,700

Completion Date: August 31, 1988

Measures Installed: 3 floodwater retarding structures, one with recreation development and one mile of channel stabilization.

Cooks Valley (Wabasha County) - Map #25

Sponsors: Wabasha Soil and Water Conservation District
Wabasha County Board of Commissioners
Cooks Valley Watershed District

Size: 15,940 acres

Authorized for Planning: February 25, 1963

Approved for Operations: August 17, 1964

Construction Started: April 13, 1966

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$ 66,220
B.	Other	135,400
Total		$201,620

Completion Date: February 25, 1974

Measures Installed: 3 grade-stabilization structures

Crane Creek (Steele and Waseca Counties) - Map #20

Sponsors: Waseca Soil and Water Conservation District
Waseca County Board of Commissioners
Steele Soil and Water Conservation District
Steele County Board of Commissioners

Size: 66,713 acres

Authorized for Planning: March 9, 1959

Approved for Operations: April 24, 1964

Construction Started: September 14, 1967

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$ 915,996
B.	Other	1,569,183
	Total	$2,485,179

Completion Date: June 18, 1976

Measures Installed: 25.1 miles of channel improvement
5 wildlife structures

Crooked Creek (Steele and Waseca Counties) - Map #16

Sponsors: Root River Soil and Water Conservation District
Houston County Board of Commissioners
Crooked Creek Watershed District

Size: 44,560 acres

Authorized for Planning: April 14, 1961

Approved for Operations: October 31, 1963

Construction Started: June 29, 1965

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$1,107,328
B.	Other	204,777
	Total	$1,312,105

Completion Date: June 18, 1976

Measures Installed: 4 floodwater-retarding structures
4 grade-stabilization structures
Streambank protection
Trout stream improvement

Janesville Village (Waseca, Blue Earth, & Le Sueur Counties) - Map #8

Sponsors: Waseca County Board of Commissioners
Blue Earth County Board of Commissioners
Waseca Soil and Water Conservation District
Blue Earth Soil and Water Conservation District
Le Sueur Soil and Water Conservation District
Alton Town Board

Size: 69,400 acres

Authorized for Planning: November 19, 1962

Approved for Operations: September 8, 1967

Construction Started: June 29, 1972

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$ 846,182
B.	Other	2,090,216
	Total	$2,936,398

Completion Date: June 18, 1976

Measures Installed: 8.2 miles of channel improvement
2 grade-stabilization structures
3 wildlife improvement structures

Joe River (Kittson County) - Map #22

Sponsors: Kittson Soil and Water Conservation District
Kittson County Board of Commissioners
Joe River Watershed District

Size: 54,960 acres

Authorized for Planning: March 12, 1962

Approved for Operations: October 31, 1963

Construction Started: June 5, 1968

Estimated Total Cost of Project:

A.	Public Law 873-566 Funds	$ 502,483
B.	Other	861,271
	Total	$1,363,754

Completion Date: June 27, 1973

Measures Installed: 26.5 miles of channel improvement
1 single-purpose wildlife structure

Lakes Okabena and Ocheda (Nobles County) - Map #31

Sponsors: Okabena-Ocheda Watershed District
Nobles County Soil and Water Conservation District

Size: 46,495 acres

Authorized for Planning: November 18, 1962

Approved for Operations: July 12, 1965

Construction Started: January 23, 1967

Estimated Total Cost of Project:

A.	Public Law 83-566	$ 716,468
B.	Other	788,563
	Total	$1,505,031

Completion Date: August 23, 1985

Measures Installed: 1 desilting basin, 1 multipurpose floodwater retarding and recreation structure and basic facilities, 5.4 miles of channel improvement, and 1 mile of water supply channel and associated wildlife.

Middle Fork of Two Rivers (Kittson County) - Map #7

Sponsors: Kittson Soil and Water Conservation District
Kittson County Board of Commissioners
Village of Hallock
Two Rivers Watershed District

Size: 57,532 acres

Authorized for Planning: February 11, 1957

Approved for Operations: May 11, 1960

Construction Started: June 30, 1965

Estimated Total Cost of Project:

A.	Public Law 83-566 Fund	$167,118
B.	Other	233,476
	Total	$400,594

Completion Date: June 27, 1969

Measures Installed: 10.6 miles of channel improvement

Norman-Polk (Norman and Polk Counties) - Map #40

Sponsors: West Polk Soil and Water Conservation District
East Agassiz Soil and Water Conservation District
Polk County Board of Commissioners
Wild Rice Watershed District

Size: 72,500 acres

Authorized for Planning: September 19, 1966

Approved for Operations: November 4, 1975

Construction Started: September 28, 1977

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$3,835,900
B.	Other	1,715,600
	Total	$5,551,500

Completion Date: August 1981

Measures Installed: 28 miles of channel work
6 grade stabilization structures

North Branch of Two Rivers (Kittson and Roseau Counties) - Map #13

Sponsors: Kittson Soil and Water Conservation District
Roseau Soil and Water Conservation District
Kittson County Board of Commissioners
Roseau County Board of Commissioners
Village of Lancaster
Two Rivers Watershed District

Size: 234,223 acres

Authorized for Planning: November 14, 1958

Approved for Operations: November 5, 1962

Construction Started: June 30, 1965

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$198,532
B.	Other	430,716
	Total	$629,248

Completion Date: June 26, 1970

Measures Installed: 11.5 miles of channel improvement
2 grade stabilization structures
1 wildlife structure

Rush Pine (Fillmore, Houston and Winona Counties) - Map #1

Sponsors: Whitewater Soil Conservation District
East Fillmore Soil Conservation District
Root River Soil Conservation District
Rushford Conservancy District

Size: 88,050 acres

Authorized for Planning: June 1, 1955

Approved for Operations: July 11, 1956

Construction Started: June 27, 1958

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$ 47,659
B.	Other	135,641
	Total	$183,300

Completion Date: June 30, 1961

Measures Installed: Stabilization of three critical sediment source areas

Tamarac River (Marshall, Kittson, and Roseau Counties) - Map #27

Sponsors: Marshall County Soil and Water Conservation District
Village of Stephen

Size: 234,700 acres

Authorized for Planning: April 15, 1963

Approved for Operations: September 10, 1965

Construction Started: September 29, 1971

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$2,506,590
B.	Other	2,550,680
	Total	$5,057,270

Completion Date: September 22, 1978

Measures Installed: 40.8 miles of channel improvement
1 grade stabilization structure
2 multipurpose structures with minimum recreation facilities

Upper Deer Creek - Lake Hendricks Minnesota Portion (Lincoln County) - Map #32

Sponsors: Lincoln Soil and Water Conservation District

Size: 9,480 acres (Minnesota)

Authorized for Planning: April 23, 1962

Approved for Operations: July 19, 1966

Construction Started: August 11, 1970

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$257,849
B.	Other	284,243
	Total	$542,092

Completion Date: June 18, 1976

Measures Installed: 1.0 miles of channel improvement
1 wildlife structure

Zippel (Lake of the Woods County) - Map #15

Sponsors: Lake of the Woods Soil and Water Conservation District
Lake of the Woods County Board of Commissioners

Size: 51,964 acres

Authorized for Planning: January 17, 1961

Approved for Operations: December 5, 1962

Construction Started: June 23, 1964

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$258,301
B.	Other	284,243
	Total	$542,544

Completion Date: June 14, 1968

Measures Installed: 16.2 miles of channel improvement.

PROJECTS AUTHORIZED FOR INSTALLATION - 4

Awaiting Construction Start - 0

Installation Underway - 3

Burnham Creek - Polk County

South Zumbro - Dodge and Olmsted Counties

Kanaranzi - Little Rock - Rock and Nobles Counties

Construction Terminated - 1

Coon Creek - Anoka County

Burnham Creek (Polk County) - Map #41

Sponsors: Polk County Board of Commissioners
West Polk Soil and Water Conservation District
East Polk Soil and Water Conservation District

Size: 104,200 acres

Authorized for Planning: May 22, 1975

Approved for Operations: March 16, 1983

Construction Started: September, 1987

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$3,121,100
B.	Other	637,400
	Total	3,758,500

Land Treatment: A total of 30,000 acres of croplands are in need of protection.

Watershed Problems: Major problems in the watershed are flood damage to cropland, excessive erosion and sedimentation, and a shortage of water-based recreation.

Project Purposes: Flood prevention, watershed protection, agricultural water management, and fish and wildlife habitat improvement.

Structural Measures Planned: 1 multiple purpose flood prevention wildlife structure (BR-6)
1 grade stabilization structure
11 miles of channel

Structural Measures Installed: Construction completed on structure BR-6. Six miles of channel work is completed.

Easement Status: Sponsors are in the process of obtaining needed land rights.

Coon Creek (Anoka County) - Map #4

Sponsors: Anoka County Soil and Water Conservation District
Anoka County Board of Commissioners
Coon Creek Watershed District

Size: 55,276 acres

Authorized for Planning: February 11, 1957

Approved for Operations: February 20, 1959

Estimated Total Cost of Project:

A.	Public Law 83-566 Funds	$ 572,837
B.	Other	1,061,601
	Total	$1,634,438

Land Treatment: Approximately 65% of the land needing treatment as shown in the work plan, is adequately treated.

Watershed Problems: Principal problems are flood damages to agricultural lands.

Project Purposes: Watershed protection - flood prevention - agricultural water management - fish and wildlife.

Structural Measures Planned: 27.1 miles of channel improvement.

Structural Measures Installed: No structural measures have been installed to date.

Easement Status: No easements have been obtained to date.

Effectiveness of Project: No degree of benefits have been obtained to date. A supplemental Work Plan Agreement deleting all works of improvement has been prepared, but to date has not been signed. This project was declared inactive March 19, 1970.

Kanaranzi-Little Rock (Nobles and Rock Counties) - Map #79

Sponsors: Nobles County Soil and Water Conservation District
Nobles County Board of Commissioners
Rock County Soil and Water Conservation District
Kanaranzi-Little Rock Watershed District

Size: 198,400 acres

Authorized for Planning: March, 1984

Approved for Operations: May 11, 1988

Construction Start Approved: June 13, 1988

Estimated Cost of Project:

A.	Public Law 83-566 Funds	$5,394,220
B.	Other	2,924,680
	Total	$8,318,900

Land Treatment: A total of 114,600 acres of croplands are in need of protection.

Watershed Problems: The major problem is the reduced net farm income due to excessive soil erosion on 114,600 acres of cropland.

Project Purpose: Watershed protection

Structural Measures Planned: Land treatment practices on 51,800 acres of cropland.

Structural Measures Installed: 11.2 acres or 11,115 feet of grassed waterways, 18.6 acres of critical area planting, 18,060 feet of terraces, 60 water and sediment control basin, 38,362 feet of underground outlets, and 1,614 acres of tillage.

Easement Status: No easements required.

South Zumbro (Dodge and Olmsted Counties) - Map #35

Sponsors: Dodge Soil and Water Conservation District
Upper Zumbro Soil and Water Conservation District
Olmsted County Board of Commissioners
City of Rochester

Size: 200,540 acres

Authorized for Planning: January 14, 1964

Approved for Operations: September 30, 1982

Construction Start Approved: August 16, 1985

Estimated Cost of Project:

A.	Public Law 83-566 Funds	$17,790,690
B.	Other	9,735,100
	Total	$27,525,790

Land Treatment: A total of 85,530 acres of crop, forest and other lands are in need of protection.

Watershed Problems: The major water resource problem in the watershed is flooding in Rochester. About one-third of the city is located on the flood plain. Other water related problems are soil erosion, sediment damage, and flooding of farmland. There is a need for additional water-based recreation and improved fish and wildlife habitat.

Project Purposes: Flood prevention, recreation & natural beauty.

Structural Measures Planned: Six single purpose flood prevention structures, one multiple purpose flood prevention-recreation structure, recreation facilities, one mile of streambank protection, and accelerated land treatment measures.

Structural Measures Installed: Construction is completed on Phase 1 of BR1. Phase 2 is 15 percent complete. Construction is complete on sites

PROJECT PLANS CURRENTLY BEING DEVELOPED - 1

Bear Creek - Allemakee, Winneshick Counties, Iowa, and Fillmore and Houston Counties, Minnesota. (Being planned by Iowa.)

Upper North Branch Root River - Dodge, Mower and Olmsted Counties

Bear Creek (Houston and Fillmore Counties, Minnesota and Allamakee and Winneshick Counties, Iowa) Map #84

Sponsors: Houston County Board of Commissioners
Root River Soil and Water Conservation District
Winneshick County Soil and Water Conservation District
Winneshick County Board of Supervisors

Size: 34,990 acres (24,780 acres in IA and 10,210 acres in MN

Approved by State Committee: August 10, 1989

Status: Preauthorization Report was developed June, 1991

Upper North Branch Root River (Dodge, Mower and Olmsted Counties) - Map #82

Sponsors: Dodge Soil and Water Conservation District
Dodge County Board of Commissioners
Mower Soil and Water Conservation District
Mower County Board of Commissioners
Olmsted Soil and Water Conservation District
Olmsted County Board of Commissioners

Size: 77,400 acres

Authorized for Planning: July, 1987

Status: Plan development started in FY - 88.

APPROVED APPLICATIONS AWAITING PLANNING ACTIVITY - 4

First Priority for Planning - Structural - 1

Whitewater River - Olmsted, Wabasha, and Winona Counties

Second Priority for Planning - 3

Cedar Valley - Winona County
Thompson Valley - Houston County
Turtle Creek - Freeborn and Mower Counties

Cedar Valley (Winona County) - Map #45
Sponsors: Winona County Board of Commissioners
Burns-Homer-Pleasant Soil and Water Conservation District
Homer Township Board
Size: 11,481 acres
Approved by State Board: April 9, 1985

Thompson Valley (Houston County) - Map #48
Sponsors: Root River Soil and Water Conservation District
Houston County Board of Commissioners
Village of Hoka, Minnesota
Size: 24,500 acres
Approved by State Board: August 31, 1964

Turtle Creek (Freeborn and Mower Counties) - Map #54
Sponsors: Freeborn Soil and Water Conservation District
Freeborn County Board of Commissioners
Mower Soil and Water Conservation District
Mower County Board of Commissioners
Size: 96,000 acres
Approved by State Board: July 29, 1965
Preliminary Investigation Report Prepared: September 13, 1972
Decisions to proceed are needed from the sponsors before planning authorization can be requested.

Whitewater River Watershed (Olmsted, Wabasha, and Winona Counties) - Map #83
Sponsors: Olmsted County Commissioners
Olmsted County Soil and Water Conservation District
Wabasha County Commissioners
Wabasha County Soil and Water Conservation District
Winona County Commissioners
Winona County Soil and Water Conservation District
Size: 205,440 acres
Approved by State Board: May, 1991
Preauthorization Report being prepared.

PROJECTS WITH PLANNING TERMINATED - 11

Deerhorn Buffalo - Clay, Wilkins, and Ottertail Counties

Dry Weather Creek - Chippewa and Swift Counties

Garvin Brook - Winona County

Mounds Creek - Brown and Cottonwood Counties

Snake River - Marshall, Pennington, and Polk Counties

South of Hawley-South Buffalo - Clay, Wilkin, Ottertail, and Becker Counties

Ten Mile Creek - Yellow Medicine County

Upper Watonwan River - Watonwan, Cottonwood and Brown Counties

Tyler - Lincoln, Lyon, and Pipestone Counties

Lazarus Creek - Yellow Medicine, and Lac qui Parle Counties, MN, and Deuel County, SD

Florida Creek - Yellow Medicine and Lac qui Parle Counties, MN

SUMMARY OF WATERSHED PLANNING AND CONSTRUCTION DURATION

SOIL CONSERVATION SERVICE, MINNESOTA

```
                                          YEARS
   NAME OF WATERSHED            '55   '60   '65   '70   '75   '80   '85   '90   '95
_____________________________.____.____.____.____.____.____.____.____.____.____
RUSH PINE                     ##=====
COON CREEK                     ###=============== 2/
MIDDLE FORK OF TWO RIVERS      #####=====>>>>>>>
SO. OF HAWLEY-SO. OF BUFFALO      #### 1/
NO. BRANCH OF TWO RIVERS          #####=>>>>>>>>
CRANE CREEK                       #####====>>>>>>>>>>>>
BEAR VALLEY                       ###==>>>>>>>>>>>
ZIPPEL                              ##==>>>>>>>>>>
CROOKED CREEK                     #####==>>>>>>>>>>>>>>>
JOE RIVER                           #######=>>>>>>>>>>>>>>
UPPER DEER CREEK-LAKE HENDRICK            #####===>>>>>>>
JANESVILLE VILLAGE                        #####====>>>>>
COOKS VALLEY                              ###=>>>>>>>>
TAMARAC RIVER                              ##=====>>>>>>>>>
LAKES OKABENA AND OCHEDA                   ##===>>>>>>>>>>>>>>>>>>>
SOUTH ZUMBRO                              ##################====>>>>>>>>>>>>
BELLE CREEK                                   ######===>>>>>>>>>
NORMAN-POLK                                 #####====>>>>>>>
CANBY CREEK                                    ######====>>>>>>>>>
BURNHAM CREEK                                              ######====>>>>>
TYLER                                                     #### 3/
SNAKE RIVER                                                 ######### 3/
KANARANZI-LITTLE ROCK                                           #####=>>>
UPPER NO. BR. ROOT RIVER                                            ###
LAZARUS CREEK                                                     ### 3/
_____________________________.____.____.____.____.____.____.____.____.____.____
                              |         |
                             --------  ------
                              PL-566    NEPA
                               1954     1969
                             --------  ------
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PLANNING

=== APPROVED FOR OPERATION

>>> CONSTRUCTION

1/ Work Plan Completed, Not Approved For Operation.

2/ Project Declared Inactive 3/19/70.

3/ Planning Terminated.

RIVER BASIN STUDIES IN MINNESOTA

Introduction

Cooperative river basin studies are made under the authority of Section 6, Public Law 83-566, the Watershed Protection and Flood Prevention Act. These studies are for appraising water and related land resources and formulating alternative plans for the conservation, use, and development of these resources. Plans may include management and land treatment measures, nonstructural measures, structural measures, or a combination of these measures that will address present and projected resource problems.

Cooperative river basin studies deals with needs as specified by the requesting agency and these needs must be consistent with the mission and responsibilities of the USDA. Generally, the studies are of limited scope and short duration to provide specific information needed for planning. Such studies should meet the immediate needs of the U.S. Department of Agriculture and cooperating agencies. Short duration studies could include:

1. Special studies needed for project planning, such as project potential or cumulative impacts of several projects.

2. Local studies for erosion reduction and/or flood prevention.

3. Studies for ground water mining reduction and/or potential for water conservation.

4. Localized studies of rural and agricultural nonpoint source pollution reduction.

5. Analysis of special problems or a single special problem.

6. Other national conservation priorities.

River basin studies are oriented toward problem solving. The final report should be useful to resource managers and decision makers in understanding their resource problems and alternatives for solutions. Ordinarily, study products should lead to implementation decisions.

Types of Cooperative River Basin Studies

There are three types of river basin studies. They differ, mainly, in the extent of planning and amount of detail included. Most of Minne-sota has been included in at least one of these studies (see Maps A and B). A brief explanation of each type of study follows.

1. Framework Studies and Assessments.

   Framework studies and assessments are merged into the first and broadest level of planning. They are the evaluation or appraisal on a broad basis of the needs and desires of people for the conservation, development, and utilization of water and related land resources, and will identify regions (hydrologic, political, economic, etc.) with complex problems which require more detailed investigations and analyses, and may recommend specific

implementation plans and programs in the areas not requiring further study. They will consider federal, state and local means for solving resource problems and will be multiobjective in nature. These studies will not involve basic data collection, cost estimating, or detailed plan formulation.

2. Regional or River Basin Plans.

A regional (political, economic, etc.) or river basin plan (hydrologic region) is a preliminary or reconnaissance level water and related land plan for a selected area. These are prepared to resolve complex long-range problems identified by framework studies and the national assessment. They will vary widely in scope and detail; will involve federal, state and local interests in plan development; and will identify and recommend plans and programs to be pursued by individal, federal, state and local entitles. They will be undertaken only where problems are interdisciplinary and of such complexity that an intermediate planning step is needed between framework and implementation level studies.

3. Implementation Studies

Implementation studies encompass the broad spectrum from preservation to full development of the resources. They can include administrative, legal, other non-development action programs, structural programs or a combination thereof to meet the study objectives. Plan formulation for implemen-tation studies include multipurpose, multiobjective considerations, benefit and cost determinations including all intangible aspects, and cost allocation, cost sharing and repayment analysis.

Status of River Basin Studies

1. Framework studies

A. Great Lakes Basin
Authorized - 1967
Status - completed 1976
Prepared by the Great Lakes Basin Commission

B. Upper Mississippi River Basin
Authorized - 1962
Status - completed 1972
Prepared by the Upper Mississippi River Basin Coordinating Committee

C. Souris - Red - Rainy Basin
Authorized - 1967
Status - completed 1972
Prepared by Souris-Red-Rainy River Basin Commission

D. Missouri Basin
Authorized - 1965
Status - completed 1971 (updated 1973)
Prepared by Missouri Basin Interagency Committee

2. Regional or River Basin Studies

A. Minnesota River Basin
Authorized - 1970
Status - completed 1977
Prepared by Southern Minnesota Rivers Basin Board

B. Southeast Minnesota Tributaries Basin
Authorized - 1970
Status - completed 1980
Prepared by U.S. Department of Agriculture

C. Minneapolis-St. Paul Regional Area
Authorized - 1973
Status - completed 1978
Prepared by Upper Mississippi River Basin Commission

D. Upper Mississippi Main Stem
Authorized - 1976
Status - completed 1980
Prepared by Upper Mississippi River Basin Commission

E. Bois de Sioux-Mustinka Subbasin
Authorized - 1970
Status - completed 1972
Prepared by Souris-Red-Rainy River Basin Commission

F. Des Moines River Basin
Authorized - 1977
Status - completed 1984
Prepared by the U.S. Department of Agriculture

G. Iowa Cedar River Basin
Authorized - 1970
Status - completed 1976
Prepared by the U.S. Department of Agriculture

H. Big Sioux River Basin
Authorized - 1965
Status - completed 1970
Prepared by the U.S. Department of Agriculture

I. Red River Basin
Request made - 1976
Request withdrawn - 1980

J. Upper Ottertail River Basin
Authorized - 1987
Status - Completed 1991
Prepared by the U.S. Department of Agriculture

K. GREAT I
Authorized - 1976
Status - completed 1980
Prepared by Corps of Engineers and U.S. Fish and Wildlife Service.

L. South Central Minnesota River Basin
Request made - 1989
Status - study began in FY-90
Being prepared by the U.S. Department of Agriculture

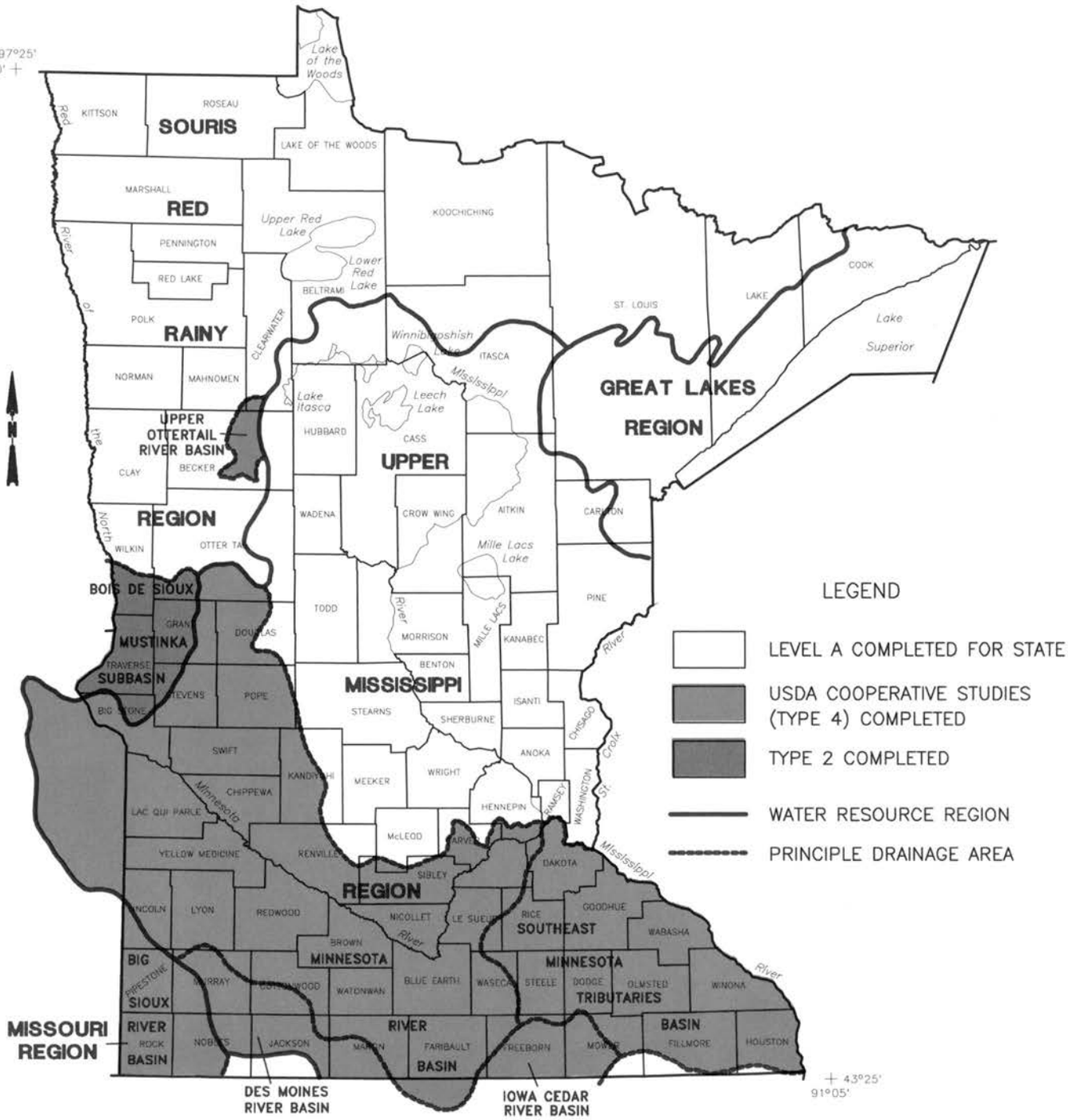
M. Leech Lake River Basin Study
Request made - 1991
Status - study underway.
Being prepared by the U. S. Department of Agriculture

3. Implementation Study

Upper Minnesota River Subbasin Study (PL-87-639)
Authorized - 1975
Status - completed 1989
Prepared by the U.S. Department of Agriculture and Corps of Engineers

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



MAP A
RIVER BASIN INVESTIGATIONS
MINNESOTA

OCTOBER 1992

Approximate Scale—Miles

0 25 50 75 100

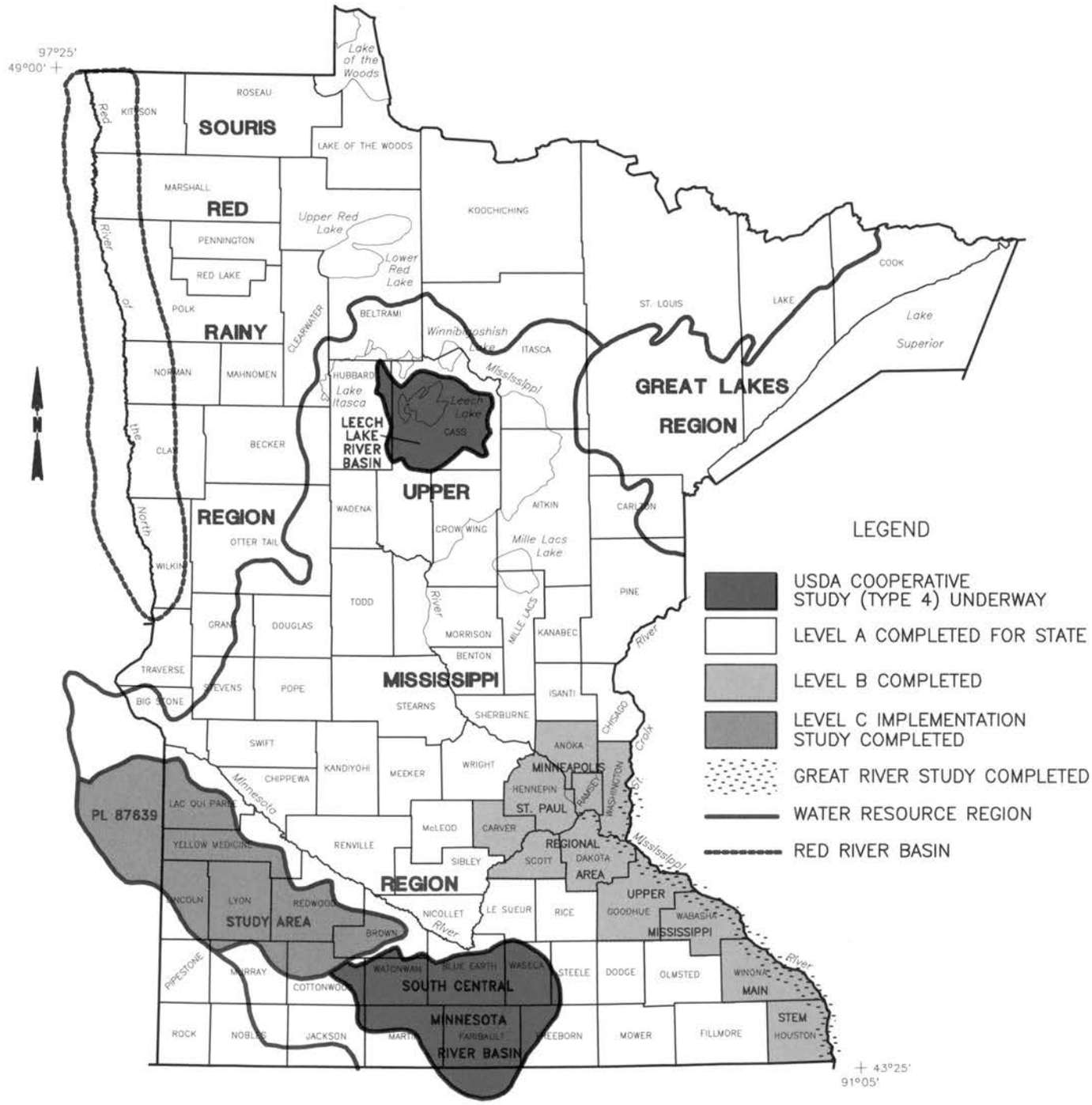
SOURCE:
INFORMATION FROM SCS FIELD PERSONNEL.
MAP PREPARED USING AUTOMATED MAP CONSTRUCTION.
ALBERS EQUAL AREA PROJECTION.
NATIONAL CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS CENTER, FORT WORTH, TEXAS, 1992.

REVISED JULY 1992 1000107

USDA-SCS-NATIONAL CARTOGRAPHIC CENTER, FT. WORTH, TX.-1992

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



MAP B
RIVER BASIN INVESTIGATIONS
MINNESOTA

OCTOBER 1992

Approximate Scale—Miles

0 25 50 75 100

SOURCE:
INFORMATION FROM SCS FIELD PERSONNEL.
MAP PREPARED USING AUTOMATED MAP CONSTRUCTION.
ALBERS EQUAL AREA PROJECTION.
NATIONAL CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS CENTER, FORT WORTH, TEXAS, 1992.

REVISED JULY 1992 1000108

USDA-SCS-NATIONAL CARTOGRAPHIC CENTER, FT. WORTH, TX.-1992

FLOOD HAZARD STUDIES

Introduction

A flood hazard report provides detailed information concerning the nature and extent of flood hazards in a community. The reports include a description of the flood hazards and detailed maps and drawings defining the local hazard areas. They serve as a technical tool to enable local residents and officials to carry out an effective flood plain management program to minimize the risk of flood damage.

The Soil Conservation Service performs flood hazard studies in Minnesota through a joint coordination agreement with the Minnesota Department of Natural Resources (MNDNR), entered into in March, 1972. This joint coordination agreement is derived from authority granted to MNDNR by the 1969 Legislature to coordinate federal, state and local governmental units in their flood plain management activities.

Local officials desiring a flood hazard study of their community should contact the Minnesota Department of Natural Resources. Prior-ities for study are based on need for the study, including degree of development pressure, and the communities' willingness to contribute to the study.

Status of Flood Hazard Reports in Minnesota

The Soil Conservation Service has published the following reports for Minnesota Communities:

1. City of Canby and vicinity. Yellow Medicine County

2. Vermillion River - city of Vermillion, city of Farmington - Dakota County

3. Elm and Rush Creeks - cities of Champlin, Corcoran, Dayton, Maple Grove, Medina and Plymouth, Hennepin County.

4. North Fork Rush Creek - cities of Maple Grove, Dayton and Corcoran, Township of Hassan, Hennepin County

5. Pioneer Creek, Spruzem Creek and Lake Robins Tributary - cities of Minnestrista, Independence and Medina, Hennepin County

E

BWSR Policy Options in Funding Manure Management Systems

Option 1

WHEREAS, the State of Minnesota has made available, through the Board of Water and Soil Resources' administered Cost Share Program, funding for the purpose of sharing in the cost of installation of manure management systems which will prevent or minimize the degradation of soil and water resources, as well as protecting the health and safety of the public; and

WHEREAS, landowners participating in the Cost Share Program are expected to act in good faith, complying with all state and local resource protection and conservation agencies' statutes and ordinances.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with state and local agencies, on a case-by-case basis, to ensure that only those landowners working in compliance with state and local agencies to install properly functioning manure management systems will be eligible to receive BWSR administered Cost Share Program funding.

Option 2

WHEREAS, the State of Minnesota has made available, through the Board of Water and Soil Resources' administered Cost Share Program, funding for the purpose of sharing in the cost of installation of manure management systems which will prevent or minimize the degradation of soil and water resources, as well as protecting the health and safety of the public; and

WHEREAS, the Minnesota Department of Natural Resources and Pollution Control Agency are required to enforce state statutes regarding improper disposal of animal manure; and

WHEREAS, landowners found to be in violation of manure management statutes are required to voluntarily comply with state and local ordinances regarding manure management, or be subject to civil and criminal penalties.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will consider landowners facing either civil or criminal action being taken by either the DNR or MPCA to be ineligible to receive Cost Share Program funding for the purpose of installing a manure management system.

Option 3 ~~(BWSR Staff Preferred Option)~~

WHEREAS, the State of Minnesota has made available, through the Board of Water and Soil Resources' administered Cost Share Program, funding for the purpose of sharing in the cost of installation of manure management systems which will prevent or minimize the degradation of soil and water resources, as well as protecting the health and safety of the public; and

WHEREAS, the Minnesota Department of Natural Resources and Pollution Control Agency are required to enforce state statutes regarding improper disposal of animal manure; and

WHEREAS, landowners found to be in violation of manure management statutes are required to voluntarily comply with state and local ordinances regarding manure management, or be subject to civil and criminal penalties.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with the appropriate state agencies and the local soil and water conservation district to determine the eligibility of a landowner to receive State Cost Share Program funding to install a manure management system. This work will take into account the knowledge and intent of the landowner, as well as the severity of the violation of state and local statutes and ordinances related to manure management.

DAKOTA COUNTY SOIL AND WATER CONSERVATION DISTRICT

Farmington Professional Building
821 Third Street
P.O. Box 129
Farmington, MN 55024
Phone: (612) 460-8004
FAX: (612) 460-8401

Option 4

WHEREAS, the State of Minnesota has made available, through the Board of Water and Soil Resources' administered Cost Share Program, funding for the purpose of sharing in the cost of installation of manure management systems which will prevent or minimize the degradation of soil and water resources, as well as protecting the health and safety of the public; and

WHEREAS, landowners participating in the Cost Share Program are expected to act in good faith, complying with all state and local resource protection and conservation agencies' statutes and ordinances; and

WHEREAS,the Minnesota Department of Natural Resources and the MN Pollution Control Agency are required to enforce state statutes regarding improper disposal of animal manure.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with the appropriate state agencies and the local soil and water conservation district, to determine the eligibility of a landowner on a case-by-case basis, to ensure that only those landowners demonstrating good faith efforts to install properly functioning manure management systems, will be eligible for BWSR administered Cost Share Program funds.

BWSR Policy Options for Funding Manure Management Systems

Option 5 (Preferred by BWSR Feedlot Advisory Committee)

WHEREAS, the State of Minnesota has made available, through the Cost Share Program administered by the Board of Water and Soil Resources, funding for the purpose of sharing in the costs of installing manure management systems which will prevent or minimize the degradation of water and soil resources and protect the public health; and

WHEREAS, feedlot owners participating in the Cost Share Program are expected to act in good faith to comply with all applicable state and local government resource protection rules and ordinances; and

WHEREAS, the current Cost Share Program rules are silent regarding the eligibility of feedlot owners / or operators who knowingly violate these rules and ordinances.

NOW, THEREFORE, BE IT RESOLVED, that the BWSR will work with soil and water conservation districts, counties and appropriate state agencies to determine the eligibility of feedlot owners / or operators for Cost Share Program funding of manure management systems on a case-by-case basis where formal enforcement actions have been taken, considering the environmental and legal facts of the situation, as well as the feedlot owner's demonstration of good faith.

G

Tim ~~Graham~~ Gramm Conservation Easement

In 1992, Mr. Graham purchased a parcel of loan-default land in Pope County from the State through the MDA. At the time, MDA was required by statute (MS103F.535, 1990) to place a conservation easement on approximately 15 acres of highly erodible soil (wind erosion) within the parcel (see attached copy of letter from Pope SWCD and associated aerial photo). Mr. Graham was reportedly well aware of the easement at the time of purchase. MDA estimates that the selling price of the total parcel was reduced by approximately $9,000 - $10,000 due to the easement ($187,000 / 290 tillable acres = $645/tillable acre x 15 acres = $9,675).

Mr. Graham wants to have the easement terminated to to permit cropping of the area and full rotation of a center-pivot irrigation system that he installed in the quarter section within which the easement is located. A circle has been drawn on the attached aerial photo to identify the approximate outer circumference of the land desired to be irrigated. Note that full rotation of the center-pivot irrigation system will require removal of the existing trees and structures at the former building site. Mr. Graham has not yet cleared this area, but intends to do so in the future. Mr. Graham indicated to Kim Krueger, Pope SWCD Technician on 4-15-93 that the existing abandoned well on the property was sealed by MDA prior to his purchasing the land.

Mr. Graham raised soybeans on a portion of the easement area last year, in violation of the conservation easement which requires permanent vegetative cover, and wants (intends?) to crop the area again this year. Responsibility for enforcement of the easement was not addressed in MS103F.535 and is unclear at this time.

Based on an opinion by Jennifer Park, BWSR AG Rep., the BWSR has authority to alter, release or terminate this conservation easement as per RIM rule 8400.3610, copy attached.

On April 14, 1993, the following state employees met with Mr. Graham and Senator Charles Berg to discuss this situation, including the above mentioned facts and steps required for Mr. Graham to develop a proposal to bring before the BWSR.

Jennifer Park, BWSR AG Rep.
Al Kean, BWSR Ch. Engr. and Conservation Program Supervisor
Paul Strandberg, MDA AG Rep.

Mr. Graham had apparently previously offered to swap a different parcel of land containing trees, shrubs and an abandoned gravel pit for the easement area. At the above meeting, Senator Berg suggested swapping the unirrigated corners of the quarter section for the easement area. Staff referred Senator Berg and Mr. Graham to the SWCD and DNR regarding the desirability of this idea. Mr. Graham seemed open to the idea of additional payment to the state for the termination of the easement. Staff also suggested that Mr. Graham consider monetary restitution for violation of the easement.

BWSR staff believe that the following items should be included in Mr. Graham's proposal to the BWSR and/or considered by the Board.

1. A recorded conservation plan for the highly erodible soil that is acceptable to the SWCD, and which may include conservation tillage, as well as windbreaks along the west and south sides of the existing easement area.

2. Agreement not to disturb the existing small wetland along the south side of the easement area.

3. Additional payment of $9,675 to the State for termination of the easement, and/or possibly the granting of a conservation easement on the unirrigated corners of the quarter section, if desirable to the SWCD and DNR (total = 34 acres).

4. Payment to the State equal to profit from cropping the easement area last year, as restitution for violation of the easement.

RECEIVED

APR 12 1993

BOARD OF
& SOIL RESOURCES

POPE SOIL & WATER
CONSERVATION DISTRICT

24 1ST AVE. SE.
GLENWOOD, MN. 56334
(612) 634-5326

DATE: April 8, 1993

TO: Mr. Al Kean
Board of Water & Soil Resources
St. Paul, Mn.

SUBJECT: Tim Gramm, Minnesota Department of Agriculture
Conservation Easement:

Dear Mr. Kean

First let me say I do not feel the State should have to bend over backwards to help Mr. Gramm. He bought this property knowing full well there was a Conservation Easement that restricted farming, on the property.

In the event the State lets Mr. Gramm farm the Easement area, which he is now doing then he should be required to meet the allowable soil loss. The Easement area consists of Hecla Loamy Sand 0 to 3 percent slope, allowable soil loss is 5 Tons/Ac. To meet this a minimum of 1,000 lbs per acre flat small grain residue or equivalent would have to be used, (Conservation Tillage). A rotation of corn & soybeans he would have to 30 percent residue cover.

There is also a small wetland in the easement area, that has been in existence since before 1951 he should not be allowed to drain this.

In addition there is a windmill next to the driveway going into the old building site. It would indicate an abandoned well on the property. If this is the case he should also be required to have this sealed.

In the event changes are made to the conservation easement on this property, I would recommend they be recorded on the title so they go with the land not the landowner.
Enclosed is an aerial photo of section 29, showing approximate area of Hecla soil, also what Mr. Gramm is farming.

Sincerely

Kim W. Krueger

KIm W. Krueger
District Technician
Pope Soil & Water Conservation District

POPE COUNTY NOT TO SCALE NOV. 1991 L.2

2844
T3031

292.3

2.27

9-466
T2267
159.5

Administered in Stevens 1986 DNR

29 (9)

EASEMENT AREA

FARMED

9.33
144.5

Administered in Stevens Co. -1981- DNR

WETLAND

623
T1723

2065
T2606

RIM Rules

11 **8400.3610 ALTERATION, RELEASE, OR TERMINATION OF EASEMENTS.**

12 The board may alter, release, or terminate an easement after
13 consultation with the commissioners of agriculture and natural
14 resources. The board may alter, release, or terminate an easement
15 only if the board determines the public interests and general
16 welfare are better served by the alteration, release, or
17 termination.

18 The board must be provided the following information at least
19 30 days prior to a board meeting, before the board will consider
20 a request to alter, release, or terminate an easement:

21 A. a letter from the landowner justifying the change and
22 identifying how the public interest and general welfare will be
23 better served;

24 B. a letter from the district board recommending the
25 change;

26 C. a letter from the Department of Natural Resources
27 wildlife manager recommending the change; and

28 D. other supporting documents, including:

29 1. an aerial photo identifying the requested
30 change;

31 2. a soil survey map of the area;

32 3. cropping history information; and

33 4. other pertinent documentation that will support
34 the request.

1 The board reserves the right to require special provisions to
2 ensure at least equal resource value as a condition of approving
3 the request. The board must be compensated for all damages and
4 loss of benefits to the conservation easement as well as
5 administative expenses and costs incurred in the alteration,
6 release, or termination of an easement. Priority must be given to
7 obtaining eligible replacement land rather than cash payment for
8 damage or loss of benefits.

Minnesota Board of Water & Soil Resources

Southbridge Office Building
155 S. Wabasha Street
Suite 104
St. Paul, MN 55107
(612) 296-3767
Fax (612) 297-5615

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Duluth, MN 55802
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3217 Bemidji Avenue N.
Bemidji, MN 56601
(218) 755-4235
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Brainerd, MN 56401-3660
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Fax (612) 297-5615

An Equal
Opportunity Employer

Printed on recycled paper

April 28, 1993

Sen. Lawrence Pogemiller
Room 235 State Capitol
St. Paul, MN 55155

Dear Sen. Pogemiller:

On behalf of the Education Committee of the Board of Water and Soil Resources, I would like to express our support for continued funding of the environmental education effort for at least the next biennium.

As you know, the current Senate K-12 Education Funding bill contains no funding for the Office of Environmental Education beginning July 1, 1993. Although it's true that the environmental education plan is scheduled to be completed by that time, our committee has real concerns that without continued funding over the next few years, few of the plan's recommendations will be carried out.

I recognize that discontinuing funding for the office may in part reflect a desire of the Senate to reduce the number of mandates that school districts must obey. I would like to point out, however, that nothing in the Environmental Education Act--which establishes the office and assigns it the task for developing and implementing the plan--requires school districts to do anything. The act focuses instead on how the office can help districts and the Department of Education meet the state's environmental education goals.

I'm confident that we are in agreement on one key point--that the education of children and adults regarding our environment is one of the most important investments we can make in Minnesota's future. Keeping this in mind, please reconsider your stance on continued funding for the office over the next biennium. Thank you, in advance, for your consideration.

Sincerely,

Sharon Clark
chair, BWSR education committee

NRCS ICCM 4/18/93

Ethics and Leadership Evaluation

What I like most about the workshop:

Group participation and small group work.

Katherine very good. I enjoyed listening to her. Thanks. Also, you look nice ☺. Keep on smiling. God loves you. P.S. Keep up the good work. Thanks.

I found the course interesting.

Common sense approach. The Golden Rule - is in the material now. You are on the right track.

Framing of ethics in context of personal values and how different they are among people - it is one key in keeping leadership from getting bogged down in style and non-issues.

I think the entire workshop was very good. This should be mandatory for all SWCD supervisors and staff to attend.

Handout. 3 presenters - good cooperation and lead-ins. Participation. Good session!

The open discussion. First time I've been to a session on ethics. Practical application.

I liked the discussion group cases and their answers because it answers some of my question. The leaders were great!

Speakers were interesting and informative.

The three speakers did a very good job of organizing and presenting the information. Ethics and leadership applies to every day life, not just "on the job." It's a chance to "look-inward" to better ourselves.

Involvement under an ethical leadership.

The participation of all of the people here. Everyone had something to offer. The gals were great.

Opportunity to re-evaluate the ethics question. We probably try, many of us in our own way, to be both fair and ethical but this added new insight to it.

Did excellent job of keeping focused on the ethics issue and how it relates to our public jobs.

Excellent training - good interaction. Topic well known by all three. I liked the examples given for each topic, real life situations (examples).

Fun workshop with a lot of enthusiasm and information.

The emphasis on each of us acting ethically as individuals. More than one presenter. Copies of overheads in hand (could have used others).

Case studies done toward last part of session.

All the examples of things they threw out and the time we had to think about it.

Could relate a lot of what was talked about in personal life and work.

Energized presenter.

The good instructors. Really kept our attention.

Ethics are much more broad based than I had perceived.

Excellent workshop. I had a good time.

That I could identify good ethical leadership and also utilize it in my daily life.

Ethical dilemma case study worksheets.

Excellent presenters. Excellent information. Useful tools given that can hopefully be applied.

The chance to work out some examples after having had some introduction to "how to do it", - the seven step process.

Catherine is a wonderful presenter!! You don't need to do so many case studies! Have more people in a group and less studies.

Ethics and Leadership Evaluation

Some things I learned:

Too numerous to list.

Listen to the situation. Find out all details before responding to situation.

We are not always right!

Seven step method. (How about some information of responsibilities of followers to keep ethical standards high?)

The seven step problem solving method.

Seven steps to solving - good handouts. How one thinks about themself regarding ethics being different than the way others do. We all have somewhat different values, but many that are similar.

Practical application of ethical leadership.

I learned different things on leadership and the ethics on them. I hope I got some right answers now.

Ethical decisions are not B/W - they aren't easy and practical application will sometimes be challenging.

Several of the above statements apply. (The three speakers did a very good job.....

Take time to listen. Act as you would be acted upon. Lead if you can live with your own ethic.

To listen - to really know what others are saying.

We all probably think we are better than we are!

We do have many problems that could be ethical and legal problems for SWCDs.

I feel the 7 steps will help in decision making.

Learned that other people are out there that feel that ethics are very important to them but not always easy to do. In the long run I hope I will be a more ethical person because a little tension at one moment will give me more restful evenings later on. Thank you.

New Ulm
4/8/93

How difficult it is for us to <u>really</u> look at a scenario from our <u>real</u>, <u>true</u>, personal perspective rather than giving "the right answer" for public consumption. We're concerned with doing the right thing, but not always with honestly dealing with the reality of the dilemmas that exist in the real world.

Everything, this was my first session. Thank you.

To look at the overall picture from all angles.

How to try to be a better ethical decision maker.

Be more open-minded - don't jump to conclusions. This topic needs to be kept closer to the surface of everyone's mind.

Many ways of doing things ethically. Always listen to the other individual.

I don't know as much about ethics as I thought I did!

Some things about how I view other people and I am not as right as I think all the time. (almost)

Give and take. Listen!!

Steps for making ethical decisions in future. Listening.

Tools and traits of ethical leadership. The importance of mission in decision making.

Ethical decisions are difficult and complex (not new, but rather reinforced).

The issue of ethics is not an easy issue! The bad thing about all of this is, it is difficult to remember all of this and to practice what we learned.

St Cloud
4/1/93

ETHICS AND LEADERSHIP EVALUATION

<u>What I like most about the workshop:</u>

Case studies were very practical and helpful - too bad they are so time consuming.

Interactions by all participants. Subject was well preserved.

The way you broke it up between three people, the time went fast - it didn't get boring.

Fast morning, well organized, excellent interaction with instructor/audience.

Case studies - they related to real examples an SWCD encounter.

Well informed presenter.

The case studies relating to water quality issues.

Teachers were excellent, did a good job.

Sharing the information with one another about other experiences and ideas.

Open discussion - it helps to hear different "reporters" during the case studies - spreads the ownership. Appreciated the fact that the case studies were based on watershed/SWCD type of problems.

The case studies - they helped me to understand the much too "in depth" lecture time. Need to use less "highly technical language". Some terminology was over my head. I figured out what was being discussed by the afternoon and really did enjoy the session.

It was very lively - at no time did it seem that I or anyone else was "wandering". The presenters all are very interested in seeing that the group is "with them" throughout - always pausing when necessary and making sure that the intent was understood. Overall, just an excellent presentation. One of the best I've attended in sometime.

The way it was presented was very good and tactful. Very well spoken, easy to listen to.

Excellent - the format and progression was logical, easy to follow and fun.

Good presenters. Liked the multiple presentation approach - made it interesting. Case studies were good way to try writing principles.

Small groups - open discussion. Helps make decision makers feel more important.

What I like most about the workshop: (Con't.)

Case studies brought out good discussion. Good program.

The cross section of all different ideas and opinions. The speakers were great.

Understanding what is involved in ethical decision making and more specifically what ethical means in different circumstances. Good workshop.

I think the instructors did a good job with a difficult subject. Ethical actions are so based in our different value.

High energy - lots of +'s and very few -'s. Keep up the good work.

Catherine Huebner was very good. I've listened to many MN Extension specialists and have been bored to tears. Her style and presentation was great. Good content - good discussion. Barb & Susan - nice to see the BWSR ladies conducting a session - great job.

Good material, good speakers, so, so jokes.☺. I feel this has been one of the better training sessions I have attended over the years.

Thought provoking.

Knowledge and expertise of presenters.

Generic case studies brought out many interesting comments and ideas.

What is my mission? Don't be judgmental? 7 critical steps. All of you gals did a super job!

Reenforcing the fact that everyone is different and may have a different ethical perspective.

Presenters were competent, friendly and articulate.

It was a very open meeting and I like the input coming from people attending.

The problem solving case studies.

St Cloud
4/1/93

ETHICS AND LEADERSHIP EVALUATION

Some things I learned:

Try to approach the individual on many ethics problems instead of going above or public.

New Methods for problem solving and addressing sticky situations.

How much there is to learn about ethical leadership.

The session created an awareness in ethical behavior and leadership for me.

Listen. Identify all facts.

Stop to reason through making an "ethical decision."

To be honest, work hard, good judgement, work together.

Share with others what I have learned at this session. Thanks.

Help supervisors to realize their potential/leadership abilities as elected officials. Helped me to realize that I have to look "into" myself and not always wonder what others will think.

I learned to have more confidence in myself because I generally have been "doing the right things" professionally and personally. My "Code of Ethics" is right on track. I do make mistakes but am glad to know it is o.k. to make them, so long as you react and learn!

It's important to look in to my own thoughts and values - and not judge what someone else is doing! Thanks.

Discussion was among the highest to state your feelings. Don't let others put words in your mouth - to be leadership, not follower.

The learning was more from the renewal and centering. Thanks.

Liked the seven step process for decision making. I'll practice. Thanks.

Making major decisions - get needed background information. Treat others with respect as you would like.

Gave me some thoughtful insight to different issues.

I learned a lot in how to approach other people. Thanks a lot.

That all people have some good ethical characteristics, if we look hard enough!

The concept of judging ourselves on our best qualities and others

on their worst was enlightening.

Just be a better listener and a bit slower to answer. Be more deliberate to exercise my every day approach to be honest and understanding.

Tools to assist in decision making. Understanding that we cannot impose our own ethical standards on others but operating in a conscientious manner is a worthwhile and hopefully influential life style.

Good information on ethical leadership.

Struggles of ethics.

That everyone has his own ethical opinion.

Everyone has different ethnic values and prioritize them differently.

Characteristics very important. I learned how to use the steps in making decisions and problem solving.

That I need to be more conscientious about the ethical decision that I make and the consequences associated with my decisions. I know a lot more about ethics than I realized, I just needed to be reminded.

To handle a problem like we would like someone to treat us if we were causing a problem.

I learned to question. I learned to listen I saw my judgmental side.

Exploring Ethical Leadership Seminar
Red River Valley Leaders
January 11, 1993

EVALUATION

What I liked most about the workshop:

- open discussion was encouraged
- examples helped add realism
- leaders readily related to audience
- showed me the error of my ways in many areas; I'm not usually as ethical as I should be
- the group's interaction on issues
- would like same program for all public employees, but more in depth
- well organized
- graphics were good
- small group participation was good
- organization and informality
- informal setting created a good environment for open discussion
- open discussion
- informal presentation
- case study examples
- review of value of thinking process
- well organized and distributed to different ethical areas; interesting
- identification of gray areas; many possibilities for unethical behavior
- learning experience
- open discussion on ethical issues
- good reminder of issues and considerations we should be aware of every day, but often forget or take for granted
- openness of topics and subjects
- learning how to handle tough problems in an ethical manner
- informed; good overheads; equipment needs work
- openness/willingness of participants to discuss real life issues in context of values and tough decisions
- presentation well presented, interesting and informative
- very interesting to say the least; well presented by all three

Exploring Ethical Leadership Seminar
Red River Valley Leaders
January 11, 1993

EVALUATION

Some things I learned:

- it is possible to have a constructive meeting of individuals of diverse backgrounds when the leaders are positive, well prepared individuals
- maybe I should not be in the position I am!
- many others here share the same beliefs/thoughts/concerns
- items that define an ethical person do necessarily create one
- to be ethical at all times
- take first impressions with a grain of salt; study problems thoroughly before making a decision
- definition and concepts of ethical parameters
- some points to follow in making ethical decisions as a leader
- seven steps in problem solving
- a reminder that we all need to be accountable in an ethical fashion as public officials/leaders
- things to consider when making ethical decisions; know all the facts
- basic procedure to handle ethical situations
- don't jump to conclusions; get all the facts
- definition of being ethical and how to be ethical in my job as commissioner
- importance of ethical person expressing his/her ideas; one list of characteristics of ethical leader had several "express" in statement - good point for a silent person like me
- to tell the truth; to tell the truth all the time; to tell the truth with candor
- that we should make this a K-12 school program
- continue on
- that I am right?

Bernidp 3/26/93

ETHICAL LEADERSHIP WORKSHOP
EVALUATION SUMMARY

What I like most about the workshop:

Great Speakers - 15
Difficult subject presented in an interesting way - 1
Structured so people felt comfortable speaking up - 2
Good Discussion and Interaction - 17
Need to have more of this - 1
Good materials - 3
Case Studies good - 6
Opportunity to look at situations objectively - 1
Mini Sessions available? - 1
Very interesting, informative and thought provoking - 3
Very enjoyable and I learned a lot - 1
All the different ways to resolve & look at problems - 1
When divided into groups of three - 1
Time went rapidly - 1
Useful information - 1
Very worthwile workshop - 2
Lunch - 1

Some things I learned:

Discuss with others - 1
Don't rush to conclusion or confrontation - 4
Search every avenue for pertinent information - 2
How much we do can be viewed from ethical perspective - 1
How judgemental I am - 1
Work through problems/lots of discussion - 2
What ethics are/understanding of ethical dilemna's - 7
The power within/more belief in myself - 2
Look at things objectively/put yourself in other persons shoes - 3
Seven steps - 4
People think a lot alike in dealing with ethics - 1
Information presented will aid in future - 3
How to get along with people - 2
People in ethical situation often times get away with things - 1
Will be a more ethical leader/better person - 2
There is a lot of grey area in ethics - 1
Think creatively - 1
Lots of discussion & exchange of ideas; my behavior will not be changed; therefore, did I learn anything??? - 1
Ethics are difficult to define; are in the eye of the beholder 1
Use common sense - 1
I'm not ethical - 1
Each person must respond in way that reflects their character and values - 1
Sharper listening skills - 1

Typical calls received/responded to Dec-Mar, 1993; B. Liukkonen, BWSR-MES WREC

Mark Johnson, St. Louis Co CLWP	re Shoreland BMPs fact sheet
Andrew Stone, Am. Groundwater Trust, NH	re teaching a Feb session, grant monies available
Eileen Anderson, St. Louis Co Extension	re Shoreland BMPs fact sheet
Mary McKay, No St. Louis SWCD	re EPA EE proposal review
Janelle Klinke, NW MES District	re my role at District conference
Dave McAllister, MES EDS, St. Paul	re revising my lead in drinking water fact sheet
Tracy Thomas, MES St. Paul	re notebooks of all MES WQ pubs ready for my pickup
Jim Huber, UMD	re Sigma Xi meeting, water research
Amy Loiselle, DNR Waters	re Shoreland BMP fact sheets
Julie Goehring, TIC, Moorhead	re Leadership seminar/my role at TIC conference
Leann Buck, MASWCD	re training sessions
Vince Crary, W. Polk Co Extension	re client's private well problem, iron
Robert Heller, UMD Geo prof	re Sugarloaf Cove, harbor issue
Mary Ann Scharf, Stevens Co Ext	re MN Rural Futures WQ packet and Stevens co CLWP
Glen Kreag, Sea Grant	re community resources & planning in Silver Bay
John Spurrier, DNR Fisheries	re Shoreland BMP fact sheets
Otto Lee, LOW Extension	re client's private well problem, bacteria
Sharon Knutson, Norman Co Extension	re community water testing program
Tammy Dunrud, MES 4-H	re incorporating one of my activities into statewide EFNEP program
Jon Roeschlein, Bois de Sioux W.D.	re CWP grant for Lake Traverse
Jim Gearns, Duluth science coordinator	re me offering EE/WQ activities for science teachers in the school district
Mary Kroll, MINNAQUA	re do I have ideas for wetlands projects for grant preproposals
Catherine Huebner, MES WQ	re mtg with Susan T for leadership seminar
Mark Aaneson, Mahnomen SWCD/CLWp	re water testing kits, lead
Howard Person, Pennington Co Extension	re water testing for wells in real estate transactions/ road ditch cultivation video
Judy Zomerfelt, NE District Sec'ry	re 1992 performance evaluation materials
Susan Tsakakis, BWSR	re Enviro-thon, etc.
Lynn Gordon, Grant Co Extension	re getting copies of the shoreland BMP fact sheets for their cluster
Marilyn Lundberg, MN Planning	re statewide NPS strategy
Carolyn Dindorf, Hennepin Conserv. Distr	re NPS stencilling and storm water runoff
Terry Salmela, Kanabec Co Extension	re private well problem, iron
Del Wright, UMC media resources	re proofs for storm drain stencilling
Ray Olson, MDH	re survey for water treatment operators
Dick Osgood, Freshwater Foundation	re Lake Management Forum and MS R proposal to McKnight
Margaret Yzaquirre, MES personnel	re payroll question
Jim Framstad, Todd SWCD/Clwp	re lake conference he's planning, speakers
Rick Dahlmann, DNR Forestry	re non-industry private forest landowners workshop and $ for BMP fact sheets
Georgia Follis, MN Rural Futures	re reviewing WQ packet they'll be distributing

Clarine Northey, Lake Co Health	re septics & water use
Paul Sandstrom, SCS	re shoreland BMP fact sheets
Mike Howe, Pope SWCD/CLWP	re Lake Emily controversy
Lisa, UMD continuing ed	re budget CUFS problem
Judy Zomerfelt, NE Dist Sec'r	re solution to CUFS problem
Kathleen Preece, editor Arrowhead Currents	re articles for upcoming issue
Karen Burke, MES EDS	re safe drinking water publication
Roberta Olson, MDH	re forum on nitrates for health professionals
Karen Schaffer, Kanabec Co Extension	re safe drinking water concern
Steven Carlson, MES 4-H/NR	re great lakes basin preproposal suggestions?
Donna Raedeke, MN Well Drillers Ed Comm	re educational materials available
Heidi Bauman, MPCA	re funds available for EE guide printing
Lowell Busman, MES WQ south central MN	re ed materials
Keith Anderson, MN Assn Farm Mutual Ins	re I was recommended to speak at mtg, unavailable, would I suggest someone?
Kim Benson-Johnson, MDH	re private well question
Myron Falcon, MDH	re fluoride in Drinking water fact sheet
Eva Mattison, LOW seasonal resident	re private well problem, bacteria & iron
Jackie Bolen, Isanti Co. homeowner	re private well problem, ntirate
Toni Meierhoff, RNP, Duluth	re nitrate in private wells for pregnant women
Tim Tosh, Crookston	re private well problem, iron & bacteria
Jody Hornvelt, LoW Extension agent	re water filters - confirming what she had told individual was correct (using her notes from the last time we talked - training the trainer - she had passed along the correct msg and no longer needs to check with me on it
Stephen Carlson, MES NR-4H	re stewardship committee, my input
Carl Wegner, Itasca Extension agent,	re Arrowhead Currents newsletter
Molly MacGregor, MHB	re volunteer monitoring network mtg
Dave McAllister, MES EDS	re lead in drinking water pub
Mary Ann Scharf, Stevens extension agent	re NPS conference in LaCrosse
Rich Harms, So St Louis SCWD	re leadership training
Steve Johnson, WLSSD	re Leadership Duluth training on environ
Dick Osgood, Freshwater Foundation	re McKnight proposal & Lake Mgmt Forum
Kim Benson-Johnson, MDH	re turning more calls over to regional MDH contacts; training at MDH well drillers wkshp
Andrew Stone, American GW Trust	re teaching at public education on gw workshop; review of wetlands book
Barb Sheedy, CSC	re AWIS board mtg
Art Norton, Itasca SWCD	re shoreland BMPs stabilizing fact hseet
Jennifer Gregory, UMD MPIRG	re info on adopting rivers and water quality
Brent ?, Red Lake Wshed District	re availability of video on surface water quality - routed to Molly Mac.
Henry Hanka, ARDC Director	re get together for BWSR staff & him
Terry Salmela, Kanabec Extension Agent	re chlorinating private well
Dale Krystosek, BWSR	re Region 5 EE committee meeting
Erik Evenson, CLWP Dakota	re elements for county water education
Nancy Larson, Clay Co health	re NPS stencilling project, from Billboard
John Thomas, MPCA Duluth	re NPS stencilling project
Jim Framstad, CLWP Todd	re lake conference flyer, NPS flyer

Steve Hughes, Big Sandy WD	re Big Sandy
Mary Kroll, MES 4-H NR	re wetlands
Susan Tsakakis	re BWSR Ethical Leadership seminars, exec comm mtg Feb 18
Judy Zomerfelt, NE Dist Sec'y	re invoice for BMP fact sheets, Feb 18 mtg
Fred Bergsrud, MES WQ	re invoice and Feb 18 mtg
Harvey Hoven, WI Sea Grant	re River Stewardship for St Louis RAP
Don Haynes, UMD	re me possibly hosting a Community Health Intern during spring quarter
Robin Payne, So St. Louis SWCD	re storm drain stenciling project
Matt Stokes, Midwest Analytical Lab	re info brkfst for medical professionals
Dorothy Stainbrook, MPCA	re NPS conference in LaCrosse
Waynes Seidel, Lake Co SWCD/MES	re 4-H stewardship project
Joe Courneya, Crow Wing Extension	re storm drain stenciling, wants to do Brainerd this spring
Joel Peterson, Fond Du Lac reservation	re erosion & sedimentation
Ann Conrad, Freshwater Foundation	re impact of snowmobile exhaust on WQ
Jennifer Pultz, New York Sea Grant	re enviuronmental stewardship award, NY storm drain stenciling materials
Jory Peterson, UMD CEE	re teaching an Elderhostel course in Oct 93
Ray Olson, MDH	re survey of municipal water users - my suggestions for a community to survey?
Howard Person, Pennington Co Extension	re Thief River as a community for MHD survey, could he facilitate it?
Jean Small-Johnson, Harmful Substances Compensation Board, St. Paul	re ability of carbon filters to remove organic contaminants, about Lake Elmo site
Dennis Slayton, Crow Wing Water Plan	re publication on using fertilizers near shore
Robley Johnson,	re contaminated water - source on farm
Julie Despot, Crow Wing Extension	re reviewing materials for homeowners on using fertilizer in shoreland areas
Dean Hertzfeld, MES PPAT	re ethical leadership training
Jean Anderson, Isanti Co Extension	re nitrate & health seminar
Bruce Poppel, Wilkin CLWP	re water testing clinic for Wilkin
Bob Enos, Cambridge Contractor	re water quality in deep wells for homes he's building
Marty Moen, MES EDS	re materials for safe drinking water week, scripts, fact sheets, etc.
Jon Roschlein, Bois de Sioux WD	re Lake Traverse receiving CWP grant
Mary Ann Scharf, Stevens Co Extension	re borrowing slides for presentation
Julie Simmons, PACE Inc, Mpls	re analysis for phyto- and zooplankton
Jim Anderson, MES - Soils	re materials for proper construction of septics to protect drinking water wells
Linda Schroeder, NPS Conference	re presenttion for LaCrosse conference
Rae Montgomery, EDS	re slides for NPS conference
Deb, Midwest Analytical Lab	re nitrates and infant health seminar
Susan Tsakakis	re shoreland BMP fact sheets
Mark Johnson, St. Louis CLWP coord	re presentation to S.L. Health on BMPs
Gene Bromenshenkl, St. Louis Extension	re shoreland BMP fact sheets
Andrew Stone, Ground Water Trust	re partnership with MES, BWSR for gw education
Dale Krystosek, BWSR Bemidji	re shoreland BMP fact sheet - how soon ready?

Teacher from North Shore School	re women to serve as judges for science fair
Terry Whittnebel, Lac Qui Parle SWCD	re women landowners seminar
Amy Ragar, Chippewa Co Extension	re storm drain painting
Julie Goehring, International Coalition	re wetlands video, shoreland BMPs,
Bonnie Thompson, Clearwater Co Extension	re bacteria in a private well problem
Mary Kroll, MES 4-H-NR	re storm drain painting project
Mary McKay, No. St. Louis SWCD	re shoreland BMPs
John Gilbertson, MN Well Drillers Assn	re water info hot line
Jannelle Klinke, NW District Sec'y	re NW District conference
Kathy Cinquanta, Hinckley resident	re water quality problem, iron & bacteria
Dennis Slayton, Crow Wing CLWP	re public survey on surface and g. water
Theresa Eclov, Miss Headwaters Bd	re shoreland BMPs for zoning mtg May 7
Scott Sparlin, SCCMR, New Ulm	re storm drain painting project
Jill Jacoby, Riverwatch, St. Louis R	re article for newsletter, Keepers of the Waters
Sue Stroschein, MDH	re nitrates and infant health
Bill Maucker, Crow Wing	re Shoreland BMPs for lake associations
Germaine Beyl, Dakota County 4-H	re storm drain painting, recycling
Brian Frederickson, MPCA	re St. Louis RAP
Blake Cozier, Duluth	re adopt a river program, drain painting
Pat Wulff, MLA	re shoreland BMPs
Kip Sundlee	re water filtration systems
Muriel Townsend, Cambridge	re nitrate in private well, 26 ppm
Laura Jung, DNR Waters	re shoreland BMPs
Sandra Wagner, citizen	re wetlands question
Dave Gustafson, MES	re slides for septic systems
Mary Kroll, MES 4-H	re storm drain painting
Ted Smith, WIS DNR	re St. Louis RAP
Diane Larson, St. Cloud homeowner	re coliform in private well
Mark Aarneson, Mahnomen CLWP	re preliminary tests from water testing kits
Paul Nordell, DNR Trails & Waterways	re storm drain painting
Dan Helweg, MPCD	re St. Louis RAP
Chris Ridgewell, Duluth citizen	re environmental fair at Merritt Elem Sch

NEED FOR REVISION OF COST-SHARE PROGRAM RULES

- Board initiated a rules revision process in 1991, largely due to acknowledgement that many changes (i.e., 1985 Farm Bill passage, cross-compliance, CRP) had occurred since 1985 (date of last rule revision)

- 1991 rule revision emphasis was to be on reviewing the eligible practices and "use" of the dollars allocated to each SWCD

- SWCDs, particularly in the metropolitan area, raised the issue of re-allocation of existing program funds and placed greater emphasis on that aspect

- As a result, the "use" of dollars and review of eligible practices was not discussed and attention turned to allocation; the Board then requested MASWCD to review the allocation process and report back to the Board with a recommendation

- MASWCD passed a resolution at its 1992 annual convention regarding an allocation recommendation and has recently forwarded that recommendation to the Board

- Consequently, it seems appropriate to revisit the need for revising the program administrative rules:
  (a) an opportunity to assess and consider the allocation recommendation from MASWCD;
  (b) an opportunity to review which conservation practices should be eligible and what "uses" of allocated dollars should be considered to accelerate land treatment for the control of erosion and the improvement and protection of water quality; and
  (c) an opportunity to acknowledge and assess the significance of recent policy and technical developments regarding water and soil resources management (e.g., Governor Carlson's Minnesota River watershed initiative, "future of CRP lands," innovations in soil loss estimation technology, some counties recent adoption of erosion control ordinances).

- Staff recommend that the administrative rules for the state cost-share program be revised

- Staff further recommend that the revision process begin with a series of information-gathering meetings with SWCDs and land users to ascertain their perspectives of items in need of revision and inclusion into the program

- Staff further recommend that, at a future Board meeting following these initial information-gathering sessions, the Board discuss and define the parameters of the policy issues to be considered during the rule revision process

- Staff further recommend that the revised rule be ready for full implementation on July 1, 1994 (Fiscal Year 1995)

H

Local Water Resources Protection and Management Program

Challenge Grant Requests-Overview

Category I. Grants to Multi-County Applicants

East Central Minnesota multi-county group:	3 Counties
Mid-Minnesota Joint Powers Board:	4 Counties
Minnesota River Joint Powers Board:	5 Counties
Mississippi Headwaters Board:	9 Counties
Redwood-Cottonwood Rivers Control Area:	8 Counties
South Central Minnesota Counties:	13 Counties
The International Coalition Counties:	15 Counties
Zumbro/Root River Joint Powers Board:	9 Counties
TOTAL:	66 Counties

66 Counties @ $1,700 per County = $112,200 in requests*

* Assuming all counties for which funds have been applied for actually participate in the Program. BWSR Field Staff have been asked to verify inclusion of their respective counties in the LWRPMP.

Category II. Grants to Individual Counties

County	Project	Request
Cass	Leech Lake Water Monitoring	$10,000
Chippewa	Cost-share of living snowfences	$ 6,000
Chisago	Drained wetland inventory	$ 3,000
Fillmore/ Houston	Septic system installation demo	$ 6,000
Hubbard	Water conservation demonstration	$ 2,900
Kittson	Extension of river water monitoring	$11,050
Lincoln	Improvement of county road drainages	$41,000
Olmsted	Water conservation demonstration	$ 7,756
Pennington	Abandoned well sealing	$ 2,716
Polk	Lake-septic system study	$ 8,500
St. Louis	Water plan implementation acceleration	$25,000
Waseca	Soil survey updating	$10,000
TOTAL		$130,726

Available Funding:	$246,122
Amount Requested:	$246,122
Remaining Amount:	$ 0

1993 LOCAL WATER PLANNING CHALLENGE GRANT PROPOSAL SYNOPSES

Category I. Multi-County Grants Applicants

East Central Counties (3 Counties: Kanabec, Mille Lacs, and Pine)
Grant Request Total: $5,100
Grant Activity: To conduct uniform water quality monitoring within the Snake River Watershed counties, looking at both natural and domestic runoff sources, with an emphasis on:

* High priority sources identified within the CLWPs for these three counties and Aitkin County; and

* Phosphorus loading from domestic sources.

Mid-Minnesota Joint Powers Board: 4 Counties (Kandiyohi, McLeod, Meeker, and Renville)
Grant Request Total: $6,800
Proposed Activity: To conduct private well water testing, in the process raising both the awareness of local citizens and health officials about well water through various presentations. Also, this activity should expand the county groundwater data base. Additional testing information for previous well water testing will be obtained and examined.

Minnesota River Headwaters Joint Powers Board: 5 Counties (Big Stone, Chippewa, Lac qui Parle, Pope, and Swift)
Grant Request Total: $8,500
Grant Recipient: Big Stone County
Proposed Activity: To develop an educational kit composed of 4-5 modules of information that can be used in public presentations to a variety of audiences. Potential module topics include the following information:

A. Groundwater Movement: information on wells, septic systems, etc. (feedlots and ag waste?)

B. Land Use Management: information on soil erosion, stormwater runoff, waste disposal, etc.

C. Conservation Practices: information on buffer strips, grassed waterways, tree plantings, etc.

D. Wetlands relationship and role related to water quality.

E. Urban issues: water conservation, lawn care, stormwater, sewage treatment(s)

F. Surface Water issues: Shoreline erosion and management, buffer strips, low impact development, construction site erosion control.

Mississippi Headwaters Board: 9 Counties (Aitkin, Beltrami, Carlton, Cass, Clearwater, Crow Wing, Hubbard, Itasca, Morrison)
Grant Request Total: $15,300
Grant Recipient: MHB
Proposed Activity: To establish a Green Shores project in each county, to develop incentives to reduce erosion by maintaining shoreland vegetation, and by developing a public information campaign to recognize persons instituting such activities, so as to export them to other areas of the county, and the respective regions bordering the MHB.

Redwood-Cottonwood Rivers Control Area: 8 Counties (Lyon, Murray, Nobles, Redwood, Rock
Grant Request: $13,600
Grant Recipient: RCRCA
Proposed Activity: Establishing an electronic mail network/system within the RCRCA; providing additional EPPL7 training to RCRCA county water planning staff, and provision of additional workshops training and assistance to RCRCA counties.

South Central Minnesota Counties Comp Water Planning Project: 13 Counties (Blue Earth, Brown, Cottonwood, Faribault, Freeborn, Jackson, LeSeuer, Martin, Nicollet, Sibley, Steele, Waseca and Watonwan)
Grant Request: $22,100
Grant Recipient: SCMCCWPP
Proposed Activity: To develop a compatible GIS base permitting information exchange between the 13 counties; to provide for the maintenance of existing Challenge Grant-purchased equipment; to provide technical training for Comp Local Water Planning coordinators, so they might access and use the Ground Water Data Base, the Lakes Data Base, and the MRAP Level III Data Base. Much of this will be conducted through the new Technology Exchange Center at Mankato State University.

Northwest Minnesota Comprehensive Local Water Planning Joint Powers Board (via The International Coalition (TIC)): 15 Counties (Becker, Clay, Clearwater, Grant, Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau, Stevens, Traverse and Wilkin)
Grant Request: $25,500
Grant Recipient: TIC
Proposed Activity: To conduct bi-monthly JPB meetings for a variety of LGUs; to implement regional coordinative strategies regarding: legislative meetings and activities, establishing data and information activities, program coordination, regional communication, and other issues as they arise.

Zumbro/Root River Joint Powers Board: 9 Counties (Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Rice, Wabasha, and Winona)
Grant Request: $15,300
Grant Recipient: ZRR
Proposed Activity: To provide a forum for communications among ZRR counties; to provide technical training needs for local water planners, to provide specialized technical expertise where needed; to provide a wide base of support and public partnership.

Category II. Individual County Grant Applications

Cass County
Grant Request: $10,000
Proposed Activity: To conduct an in-flow study of Leech Lake, to determine flow rates, stage elevations, and a variety of chemical levels. This is a partial follow-up to the Clean Water Partnership Phase I study of the Leech Lake Watershed, and will be conducted in cooperation with the Leech Lake Association, the Cass SWCD, Leech Lake Tribal Council, MN DNR, MPCA and SCS.

Chippewa County
Grant Request: $6,000
Proposed Activity: To offer an incentive program to county landowners to establish a living snow fence (i.e., buffer strips with trees) to control soil erosion. Targeted areas will be land along drainage systems, or in agricultural fields. Landowner applications will be reviewed by a technical panel of SWCD, SCS and ASCS personnel.

Chisago County
Grant Request: $3,000
Proposed Activity: To identify and restore drained wetlands on private land in the county. The overall goal of the project will be to improve and enhance wetland wildlife habitat, as well as water quality. This project will eventually be expanded over the entire Onanegozie RC&D Area counties.

Fillmore/Houston Counties
Grant Request: $6,000
Proposed Activity: To provide cost-sharing to at least 2 landowners in each county, for the purpose of installing conforming septic systems on sites with currently non-conforming systems. Work will be done only by installers who have attended the MPCA-sponsored On-Site Sewage Treatment Certification workshop. These installations will be used as demonstration sites by each county.

Hubbard County
Grant Request: $2,900
Proposed Activity: To focus on the promotion of water saving devices and water conservation methods for households, businesses and public facilities. This will include an information/education campaign.

Kittson County
Grant Request: $11,050
Proposed Activity: A continuation of the 1991 Challenge Grant study monitoring the water quality of the Roseau, Joe and Two Rivers water quality, as well as pesticide levels within each river. Additional work will be done to identify land uses within the watershed, as well as monitoring inputs from potential non point source sites. Eventually best management practices will developed, designed, and installed to prevent excess sediments and nutrient from entering each water body.

Lincoln County
Grant Request: $41,000
Proposed Activity: To implement a portion of the 1991 Challenge Grant results, which showed that restrictive road crossing installation within the county could reduce peak flows, reduce flood potential, and have a positive impact on nutrient and sediment transport. Funds will be used to plan and design two of these installations, as well as acquiring land rights and enhancing two existing wetlands.

Olmsted County
Grant Request: $7,756
Proposed Activity: To focus on the promotion of water saving devices and water conservation methods for households, businesses and public facilities. This will include an information/education campaign.

Pennington County
Grant Request: $2,716
Proposed Activity: To provide 50% cost-sharing for the purpose of sealing 13 abandoned wells identified as priorities by the Pennington County SWCD.

Polk County
Grant Request: $8,500
Proposed Activity: To conduct an inventory of the Maple Lake with and for property owners and their properties, so as to identify where improperly functioning systems are contributing non point source pollution to the lake. This will include an educational campaign, as well as a series of meetings with owners.

St. Louis County
Grant Request: $25,000
Proposed Activity: To accelerate implementation of the County Comprehensive Local Water Management Plan. This includes work in 4 areas, including:

1) Participating in the regional water quality newsletter "Arrowhead Currents";

2) developing local materials to complement the shoreland BMPs;

3) organizing county water quality information centers, along with expansion of the DNR Lake Advocate Program; and

4) working with the MPCA to expand the citizen lake monitoring program throughout the county.

Waseca County
Grant Request: $10,000
Proposed Activity: To financially assist in the updating of the Waseca County soil survey. Work over a six to 7 year period would consist of field data collection, then transfering this data to a map base.

OVERVIEW OF THE ISANTI COUNTY COMPREHENSIVE LOCAL WATER PLAN
FEBRUARY 26, 1993

On March 21, 1990, the Isanti County Board of Commissioners formally initiated the development of a 110B Comprehensive Water Management Plan. The Isanti Soil and Water Conservation District was designated the lead agency. The Commissioners appointed the Public Health Director as the Water Planning Coordinator.

On November 20, 1991, an alternative planning structure was adopted by the Board. This structure consisted of a water plan task force and technical committee with coordination provided by the local Soil and Water Conservation District. The task force members were approved by the County Board on October 6, 1991 and held its first meeting October 29, 1991. The first draft plan was approved by the task force on October 20, 1992.

County Description

Isanti County is located in East Central Minnesota. The County is bordered on the east by Chisago County, north by Kanabec, west by Mille Lacs and Sherburne County and on the south by Anoka County.

Most of Isanti County is in the Southern one-third of the Rum River Watershed (364.7 sq.mi.). Regional groundwater within the Rum River flows in a southeasterly direction. Nearly all the county is drained by the Rum River which enters the county from the north then continues south and joins the Mississippi in western Anoka County. The southeastern portion of Isanti County is included in the Lower St. Croix River Watershed (64.8 sq.mi.). The Snake River Watershed encompassing (21.1 sq.mi) is located in the extreme northern part of the county and flows north toward the Snake River. These three major watersheds are composed of 17 minor watersheds (10) in the Rum River, (4) in the Lower St. Croix, and (3) in the Snake River.

Isanti County varies from 1150 feet above sea level at its highest point to 875 feet above seas level at its lowest. Soils in the County are composed of glacial and postglacial deposits characterized by undulating and rolling morainic hills, outwash sandplains, old glacial lake bed, bogs lakes, dry stream channels and barbed streams.

60% of Isanti County overlays the anoka sand plain which was formed by the Mississippi River as it followed the Grantsburg Sublobe when the glacier melted. The sandplain has relatively smooth relief, fingerlike depressions many small isolated bogs and scattered dunelike knolls. Soils are loamy fine sand texture. The areas of highest pollution potential are in the southern part of the county

within this sand plain area.

Isanti County, an area which was once grassland, brushlands, pine and hardwood forests, bogs and swamps is now a predominantly agriculture, however only a small percentage of residence engage in agriculture as a profession. Approximately half of the working residents commute to the Twin Cities metropolitan area.

Isanti County has incorporated responses and changes indicated and recommended by all state agencies who responded to the preliminary plan review. Staff anticipates Plan action at the May 26, 1993 Board meeting.

CLEAN WATER

You Can Make A Difference

AG-FO-6125-C
1993

BEST MANAGEMENT PRACTICES FOR NITROGEN USE STATEWIDE IN MINNESOTA

G. W. Randall, Soil Scientist, Southern Experiment Station,
and M. A. Schmitt, Extension Specialist, Dept. of Soil Science,
University of Minnesota

Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface- and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

The research-based Best Management Practices (BMPs) outlined in this bulletin are economically and environmentally sound. It is strongly suggested that farmers adopt them voluntarily. By following these recommendations, agriculture can avoid the threat of fertilizer regulations and enjoy a more profitable and better community.

These nitrogen BMPs were assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by the MDA.

MINNESOTA EXTENSION SERVICE

UNIVERSITY OF MINNESOTA

Introduction

Nitrogen (N) is an essential plant nutrient that is applied to Minnesota crops in greater quantity than any other fertilizer. In addition, vast quantities of nitrogen are contained in the ecosystem, including soil organic matter. Biological processes that convert nitrogen to its mobile form, nitrate (NO_3), occur continuously in the soil system. (For greater detail see *Understanding Nitrogen in Soils* AG-FO-3770.) Unfortunately, nitrates can be leached from the rooting part of the soil. To minimize losses to surface- and groundwater, management guidelines have been developed.

In response to the Comprehensive Groundwater Protection Act of 1989, a Nitrogen Fertilizer Management Plan was developed with the purpose of managing nitrogen inputs to crop production so as to prevent degradation of Minnesota water resources while maintaining farm profitability. The central tool for achievement of this goal is the adoption of Best Management Practices (BMPs) for nitrogen. The primary focus of the BMPs is nitrogen fertilizer; however, consideration of other nitrogen sources and agronomic practices is necessary for effective and practical total nitrogen management.

BMPs for nitrogen are broadly defined as "economically sound, voluntary practices that are capable of minimizing nutrient contamination of surface- and groundwater." The BMPs recommended here are based upon research, particularly at the University of Minnesota and other land-grant universities, and upon practical considerations. This ensures that the BMPs are technically sound and likely to be easily adopted by growers.

BMPs are based, in part, upon the concept of total nitrogen management, which accounts for all forms of on-farm nitrogen in the development of crop management plans. In addition to the statewide BMPs shown in this bulletin, a set of BMPs has been prepared for special situations and specific regions of the state (**Figure 1**). A listing of the bulletins containing these BMPs can be found on the last page of this bulletin.

Statewide Nitrogen BMPs

Statewide BMPs are applicable to all crops, farming practices, and areas of the state. They are based upon the concept that accurate determination of crop nitrogen needs is essential for profitable and environmentally sound nitrogen management decisions.

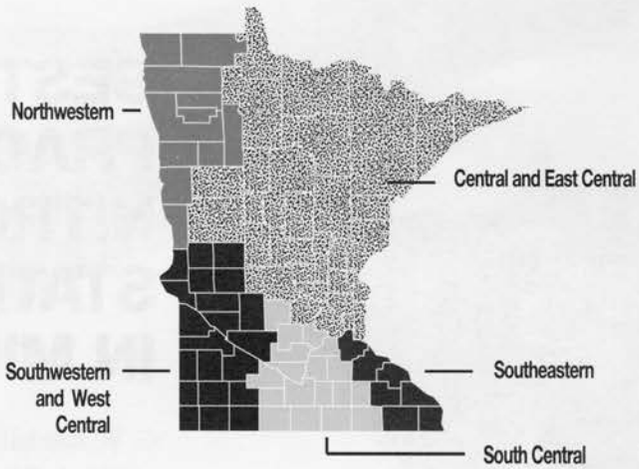
Statewide nitrogen BMPs include:

- **Develop realistic yield goals.**

Unrealistically high yield goals can cause farmers to apply too much nitrogen, resulting in reduced profit and a higher potential for nitrogen loss to groundwater.

Accurate farm records should be used to calculate average yield for each field. The yield goal, specific for each field, should be based on the most recent five-year average, excluding the worst year. Using the most recent five-year crop yields makes sure that technological advances and current management practices for specific fields or crops are taken into account in determining yield potential. Excluding the worst year helps keep catastrophic events from artificially lowering yield potential. If crop rotation practices reduce the number of years that can be included in the most recent five-year average, yield goals can be based on farm-specific information from the previous five years for the specific crop to be fertilized.

Figure 1
The five regions for which BMPs are formulated



Although maximum yield potential may occasionally be limited using this approach, long-term economic analysis indicates that using past average yields as a guide to crop nitrogen needs maximizes profitability while at the same time significantly reduces the potential for nitrate contamination. An average yield approach provides a sound basis for field-specific nitrogen recommendations that are environmentally sensitive and agronomically sound.

■ **Develop and use a comprehensive record-keeping system to record field-specific information.**

Accurate field records should be kept by farmers for use in their crop management decisions because such records are essential to developing realistic yield goals and attaining maximum profitability. This field- and farm-specific information should be used to evaluate past experience and to plan future nitrogen management programs. At a minimum, farmers are encouraged to accurately and systematically keep information on crop yields, nitrogen fertilizer and manure applications, and soil test results. The information can be used to monitor and adjust nitrogen management more precisely to maximize profit and protect the environment.

■ **Adjust nitrogen rate according to soil organic matter content, previous crop, and manure application.**

Soil organic matter releases nitrogen that is available to crops. Nitrogen recommendations in Minnesota should be adjusted for soil organic matter content if a soil nitrogen test is not used.

Legumes in a crop system can supply substantial amounts of nitrogen to subsequent crops. For example, first-year credits for nitrogen can range from 40 pounds of nitrogen per acre (lb N/A) for soybeans to 150 lb N/A for alfalfa. Similarly, manure application should significantly lower fertilizer nitrogen application rates.

Research results from a 12-year study conducted at Waseca clearly show a 40-lb nitrogen credit when corn followed either soybeans or wheat **(Table 1)**. Optimum nitrogen rates for continuous corn, corn after soybeans, and corn after wheat were 160, 120, and 120 lb N/A, respectively.

Table 1
Effect of previous crop on corn response to nitrogen from 1975-86 at Waseca.[1/]

Rate (lb N/A)	Previous Crop (bu/A)		
	Corn	Soybeans	Wheat
0	75	109	104
40	100	134	130
80	115	146	147
120	125	153	151
160	133	158	154
200	136	158	156

1/ From Randall et al.

Failing to account for these sources of nitrogen in determining the correct application rate creates a surplus of nitrogen, a surplus that can potentially leach to groundwater. (For greater detail on nitrogen rates as influenced by soil organic matter and previous crop see *Fertilizing Corn in Minnesota* AG-FO-3790.)

■ **Use a soil nitrate test when appropriate.**

Use of a deep soil test to measure residual soil nitrate in the root zone can save money by reducing nitrogen recommendations in regions of Minnesota where average annual precipitation is approximately 25 inches or less. In western Minnesota, the soil nitrate test is a key management tool for corn, small grain, and sugar beet producers. Soil should be collected prior to planting from a 0-24 inch depth for corn and small grains and from a 0-48 inch depth for sugar beets. (For greater detail see *Using the Soil Nitrate Test for Corn in Minnesota* AG-FO-2274; *Fertilizing Corn in Minnesota* AG-FO-3790; and *Fertilizing Wheat in Minnesota* AG-FO-3772.)

Recent research in south-central, southeastern, and east-central Minnesota also indicates that a spring soil nitrate test can be helpful in determining if fertilizer nitrogen is needed on medium- and fine-textured soils. Soil samples should be collected before planting from the 0-24 inch depth and analyzed for nitrate-nitrogen (NO_3-N). Our current interpretation indicates that if the analysis shows a carryover of 175 lb N/A or more, no fertilizer nitrogen is recommended. If the test indicates less than 175 lb N/A, nitrogen recommendations should be based on realistic yield goal, soil organic matter content, and previous crop. Changes in the nitrate soil test interpretation and more precise recommendations will come in the near future as our data base grows.

This soil nitrate test has the greatest utility when high amounts of residual NO_3-N are a distinct probability. These conditions may be expected to exist where:

— manure has been applied repeatedly to a field,

— the yield of last year's crop was much less than expected because of drought, hail, insect damage, etc., and

— continuous corn has received liberal quantities of fertilizer nitrogen.

This test should not be used for first-year corn following alfalfa or where manure has been applied within the previous nine months, because the nitrogen credit will be underestimated.

■ **Use prudent manure management to optimize nitrogen credit.**

Manure management programs should be planned to optimize nutrient use. The amount of nitrogen supplied by manure will vary with the source of manure (type of livestock), handling and storage, application rate, and method of application.

Test manure for nutrient content.

The nutrient content of manure is affected by animal species, type of manure-handling system, livestock housing and bedding system, diet, temperature, and outside contamination, etc.— all of which are specific to the particular livestock operation. The best method to determine nutrient supply from manure is to analytically test the manure for its nutrient content. It is essential that a representative sample of the manure be taken. Inaccurate readings of nutrient content due to a poorly taken sample (not well mixed, insufficient subsamples, poorly agitated) can result in large differences between what is estimated and the actual amounts of nutrients applied. Relying on published average nutrient values for manure can be very misleading; research results for manure analyses in Minnesota vary from these average values by a range from 25 to 300 percent.

Calibrate manure application equipment.

Correct application of manure to cropland is critical to maximize the value of manure to crop producers. For farmers to be able to give credit for nutrients in manure and not create environmental problems, they must be confident of the accuracy of their application rate.

Apply manure uniformly throughout a field.

For manure to be used efficiently as a nutrient source for crop production, the spread pattern must be uniform throughout the field. If this is not done, concentrated zones and deficient zones will exist. These nutrient excesses and shortages within the field create the potential for environmental contamination and poor economic return. It is also important that liquid or slurry manure be well agitated before transport to the field. This helps ensure that nutrient availability from all portions of the storage facility is equal, thus ensuring uniformity between the first loads and last loads of manure hauled to the field.

Injection of manure is preferable, especially on strongly sloping soils.

Injection methods should place liquid manure below the soil surface, thus eliminating surface runoff on sloping soils and volatilization of ammonia from the manure on all soils. New systems such as sweep injectors spread the manure in horizontal patterns under the soil. These systems are not as susceptible to channel erosion as the older knife systems, with which runoff water can flow downslope in the knife tracks and cause erosion and nutrient loss. Injecting manure is especially important in preventing contamination of surface-water supplies.

Avoid applying manure to sloping, frozen soils.

Application of manure to sloping, frozen soils is discouraged because of the high potential for runoff with snowmelt in the spring. In addition, overwinter volatilization of ammonia from the manure substantially reduces the amount of manure-nitrogen available for the crop.

Incorporate broadcast applications whenever possible.

Broadcasting is a common way to apply solid, slurry, and liquid manures. Because of the high potential for ammonia loss, it is recommended that manure be incorporated within 12 hours to optimize its nitrogen value.

Incorporation is also important for aesthetic and odor reasons. Rapid incorporation of manure may defuse some of the tensions that can occur in a community where manure is broadcast close to nearby neighbors or housing developments. In addition, local ordinances adopted to restrict livestock production systems may be less rigid if broadcast manure is always incorporated quickly.

(For greater detail on manure management consult the appropriate bulletins listed on page 7 of this bulletin.)

■ **Credit second-year nitrogen contributions from alfalfa and manure.**

Alfalfa and manure can supply nitrogen for more than one crop year. Recent University of Minnesota research indicates that a credit of 75 lb N/A can be adopted for second-year corn following a good stand of alfalfa on medium- and fine-textured soils. A 50-lb nitrogen credit for second-year corn is given when a fair stand (two to three plants/foot) of alfalfa has been plowed down.

The organic nitrogen in manure is transformed to plant-available nitrogen over a period of several years. Between 33 and 50 percent of the organic nitrogen remaining will be converted to plant-available nitrogen each year after the manure is applied. The value of

manure analyses and an accurate and uniform application rate can again be seen as they provide information and confidence when assigning a nitrogen credit to previous manure applications.

■ **Do not apply nitrogen above recommended rates.**

Nitrogen application rates higher than current University of Minnesota and other land-grant university recommendations have been shown to significantly increase nitrate leaching losses and subsequent contamination of groundwater. A high degree of confidence can be placed in University of Minnesota and neighboring land-grant university recommendations because they are based on long-term, statistically-based field research studies. Environmental impacts will be reduced if recommendations are followed.

Application of the proper rate of nitrogen has a larger influence on nitrate losses to our water resources than any other nutrient or crop management factor. The concept illustrated in **Figure 2** demonstrates the significant impact that nitrogen rate has on crop yield. At nitrogen rates above the optimum level, yield is no longer increased but nitrate losses increase substantially.

Nitrate losses can be minimized by using the proper nitrogen rate combined with the other BMPs given in this bulletin and in the region-specific bulletins. Note that some nitrate loss occurs from a row crop even without the addition of fertilizer nitrogen. These losses occur naturally and are primarily related to the mineralization (breakdown) of soil organic matter, which releases nitrate to the soil system.

Research results obtained from continuous corn grown on a Port Byron silt loam in Olmsted County clearly show that increasing fertilizer nitrogen rates *does not* increase corn yield and *does* increase the NO_3-N leached from the soil (**Table 2**). The five-year yield averages show a highly profitable yield response to the 150-lb N/A rate and no additional yield increase to the 225-lb N/A rate. At the same time the NO_3-N concentration in the soil water at the 7.5-foot depth one year after discontinuing these treatments was substantially higher with the 225-lb rate compared to the 150-lb rate. Very low NO_3-N concentrations were found at the nitrogen rates that gave less than optimum yields.

Figure 2
Conceptual impact of nitrogen (N) rate on crop yield and nitrate loss from a corn production system.

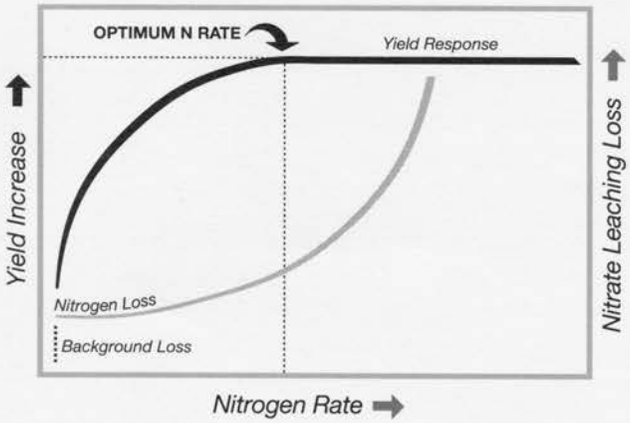


Table 2
Average corn grain yield and NO_3-N concentration in soil water at 7.5 feet in Nov. 1992 as influenced by nitrogen rates from 1987-91 for corn in Olmsted Co.[1/]

1987-91 rate (lb N/A per yr)	1987-91 Avg. Grain Yield (bu/A)	NO_3-N Concentration in soil water at 7.5 ft. (ppm)
0	82	2
75	141	4
150	168	17
225	164	32

1/ From Randall, et al.

Somewhat similar results were found in tile drainage water leaving continuous corn plots at the Southern Experiment Station at Waseca (**Table 3**). Nitrogen was applied annually from 1977 to 1982 to the same plots on a Webster clay loam. Corn grain yields were optimized at the 180-lb N/A rate. Applying 240 lb N/A did not increase yields additionally, yet NO_3-N concentrations were increased by 7 parts per million (ppm) with the higher rate. Applying the nitrogen in the spring (a BMP) compared to the fall decreased NO_3-N concentrations in a range from 2 to 4 ppm regardless of nitrogen rate while

Table 3
Average corn grain yield and NO_3-N concentration in tile drainage water as affected by nitrogen rate and time of application at Waseca.[1/]

Nitrogen Treatment Rate (lb N/A)	Time of Application	1978-82 Avg. Corn Yield (bu/A)	1978-82 Avg. NO_3-N Concentration in tile lines (ppm)
0	-	66	7
60	Spr.	110	8
120	Fall	131	15
120	Spr.	150	13
180	Fall	160	19
180	Spr.	168	15
240	Fall	163	26
240	Spr.	155	22

1/ From Randall

increasing yields 5 to 15 percent. This illustrates the mutual benefit of combining other BMPs, such as time of application, with the proper rate of nitrogen application.

Results from these studies and others conducted in the Midwest clearly show that high ("insurance") rates of nitrogen should not be applied. Nitrogen applied at rates above optimum are costly in terms of return on the fertilizer investment and the environmental consequences of the higher nitrate losses.

■ **Plan nitrogen application timing to achieve high nitrogen-use efficiency.**

Nitrogen application timing can significantly affect the efficiency of nitrogen use and the potential for nitrate contamination of groundwater. Generally, the greater the time between application and crop uptake, the greater the chance for nitrogen loss. On medium- to fine-textured soils a spring preplant application of nitrogen has been ideal. Yields with split or single sidedress treatments often are no better than with preplant application and sometimes are poorer. If sidedressed nitrogen is applied too late for crop use, or if dry conditions exist for an extended period of time after sidedress application, nitrogen will not be efficiently used by the crop. Instead it remains in the soil profile where it is susceptible to leaching in the fall or early the following spring. In Minnesota, the period of maximum nitrogen uptake by corn continues from late June through July. Therefore, fall nitrogen application—eight months before the start of nitrogen uptake—has the highest potential for nitrate loss. Even April applications of nitrogen on irrigated sandy soils exhibit a high potential for loss. Thus, region-specific BMP recommendations should be used to achieve high nitrogen-use efficiency.

Related Publications

AG-FO-6126	Best Management Practices for Nitrogen Use in Southeastern Minnesota
AG-FO-6127	Best Management Practices for Nitrogen Use in South-Central Minnesota
AG-FO-6128	Best Management Practices for Nitrogen Use in Southwestern and West-Central Minnesota
AG-FO-6129	Best Management Practices for Nitrogen Use in East-Central and Central Minnesota
AG-FO-6130	Best Management Practices for Nitrogen Use in Northwestern Minnesota
AG-FO-6131	Best Management Practices for Nitrogen Use on Irrigated, Coarse-Textured Soils
AG-FO-5880	Fertilizing Cropland With Dairy Manure
AG-FO-5879	Fertilizing Cropland With Swine Manure
AG-FO-5881	Fertilizing Cropland With Poultry Manure
AG-FO-5882	Fertilizing Cropland With Beef Manure
AG-FO-5883	Self-assessment Worksheets for Manure Management Plans
AG-FO-3790	Fertilizing Corn in Minnesota
AG-FO-3813	Fertilizing Soybeans in Minnesota
AG-FO-3814	Fertilizing Alfalfa in Minnesota
AG-FO-3773	Fertilizing Barley in Minnesota
AG-FO-3772	Fertilizing Wheat in Minnesota
AG-FO-3770	Understanding Nitrogen in Soils
AG-FO-3774	Nitrification Inhibitors and Use in Minnesota
AG-FO-3769	Providing Proper N Credit for Legumes
AG-FO-2274	Using the Soil Nitrate Test for Corn in Minnesota
AG-FO-2392	Managing Nitrogen for Corn Production on Irrigated Sandy Soils
AG-FO-0636	Fertilizer Urea
AG-FO-3073	Using Anhydrous Ammonia in Minnesota
AG-FO-6074	Fertilizer Management for Corn Planted in Ridge-till or No-till Systems
AG-FO-3553	Manure Management in Minnesota

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CLEAN WATER

You Can Make A Difference

AG-FO-6126-B
1993

BEST MANAGEMENT PRACTICES FOR NITROGEN USE IN SOUTHEASTERN MINNESOTA

by G. W. Randall, Soil Scientist, Southern Experiment Station, and
M. A. Schmitt, Extension Specialist, Dept. of Soil Science,
University of Minnesota

Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

The research-based Best Management Practices (BMPs) outlined in this bulletin are economically and environmentally sound. It is strongly suggested that farmers adopt them voluntarily. By following these recommendations, agriculture can avoid the threat of fertilizer regulations and enjoy a more profitable and better community.

Introduction

Nitrogen (N) is an essential plant nutrient that is applied to Minnesota crops in greater quantity than any other fertilizer. In addition, vast quantities of nitrogen are contained in the ecosystem, including in soil organic matter. Biological processes that convert nitrogen to its mobile form, nitrate (NO_3), occur continuously in the soil system. (For greater detail see *Understanding Nitrogen in Soils* AG-FO-3770.) Unfortunately, nitrates can be leached from the rooting part of the soil. To minimize losses to surface- and groundwater, management guidelines have been developed.

Best Management Practices (BMPs) for nitrogen are broadly defined as "economically sound, voluntary practices that are capable of minimizing nutrient contamination of surface- and groundwater." The BMPs recommended here are based upon research, particularly at the University of Minnesota and other land-grant universities, and upon practical considerations.

BMPs are based, in part, upon the concept of total nitrogen management, which accounts for all forms of on-farm

These nitrogen BMPs were assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by the MDA.

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nitrogen in the development of crop-management plans. BMPs were developed to be adopted on a statewide as well as a regional basis. Those developed for the unique soil and climatic conditions of southeastern Minnesota refine the recommendations of the statewide BMPs.

Statewide Nitrogen BMPs

Statewide BMPs are applicable to all crops and farming practices. They are based upon the concept that accurate determination of crop nitrogen needs is essential for profitable and environmentally sound nitrogen management decisions. The statewide BMPs shown below are described in greater detail in *Best Management Practices for Nitrogen Use Statewide in Minnesota* AG-FO-6125.

- Set realistic yield goals.
- Develop and use a comprehensive record-keeping system for field-specific information.
- Adjust nitrogen rate according to soil organic matter content, previous crop and manure applications.
- Use a soil nitrate test where appropriate.
- Use prudent manure management to optimize nitrogen credit.
  - –Test manure for nutrient content.
  - –Calibrate manure application equipment.
  - –Apply manure uniformly throughout a field.
  - –Injection of manure is preferable, especially on strongly sloping soils.
  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

BMPs for Southeastern Minnesota

Southeastern Minnesota is characterized by permeable, silt loam soils with underlying fractured limestone bedrock. This "karst" region is very susceptible to groundwater contamination. Average annual precipitation in the region is greater than 30 inches. Crops include corn, forages, oats and soybeans. Livestock production consists primarily of dairy, beef and hogs. BMPs for the counties shown in **Figure 1** (Dakota, Goodhue, Fillmore, Houston, Olmsted, Wabasha and Winona) have been developed based on field research conducted in these counties.

The nitrogen BMPs for southeastern Minnesota include:

- **Do not apply fertilizer nitrogen in the fall.**

Figure 1
Seven-county area of southeastern Minnesota for specific BMPs for nitrogen

Fall application of nitrogen produces a greater risk of nitrate leaching in southeastern Minnesota because of high average annual precipitation, the well-drained and permeable nature of the soils and the presence of karstic terrain. Spring preplant or sidedress nitrogen applications provide more efficient use of nitrogen than fall application.

A continuous corn study conducted in Olmsted County beginning in 1987 clearly demonstrates that nitrogen should not be applied above recommended rates and definitely not in the fall (**Table 1**). Highest four-year average yields occurred with the 150 lb nitrogen rate; however, NO_3-N concentrations in the soil water at 5 feet also began to climb rapidly at this rate. At this site, a nitrogen rate of about 120 pounds of nitrogen per acre (lb N/A) would have optimized yield and profitability to the farmer while minimizing nitrates in the groundwater.

Fall application (Nov. 13) of anhydrous ammonia with and without N-Serve gave yields in 1990 that were 7 to 10 bushels per acre (bu/A) less than with the same nitrogen rate applied in the spring before planting (Table 1). Moreover, NO_3-N concentrations in the soil water were 50 to 70 percent higher with the fall applications. Nitrate-N concentrations in the soil water in October 1988 were also highest for the fall applications; however, yields were not affected that year. Examination of the four-year yield average does not show consistent yield decreases with fall-applied nitrogen, but in seasons with above-normal rainfall lower yields can be encountered with fall application of nitrogen.

- **Spring preplant application of anhydrous ammonia or urea is encouraged. Broadcast urea should be incorporated within three days of application.**

For preplant applications, use of ammonium forms of nitrogen fertilizer instead of nitrate forms reduces the immediate potential for nitrogen leaching loss. Under normal spring conditions anhydrous ammonia and urea will take from two to six weeks to nitrify from ammonium to nitrate. This delay decreases the potential for leaching of

nitrate during the last part of April and in May, when precipitation is highest and crop demand for nitrogen and water is very low.

Urea broadcast on the surface should be mixed into the soil (incorporated) soon after application to reduce potential loss by volatilization and surface runoff. Volatilization is generally accelerated by crop residue and high soil pH. High soil pH is uncommon in southeastern Minnesota, but large amounts of surface residue are common because conservation tillage is used with continuous corn. In addition, urea left on the soil surface can easily be washed toward streams and sinkholes during intense rains.

■ Apply sidedress applications to corn before it is 12 inches high.

Limiting sidedress applications to corn shorter than 12 inches will help ensure that nitrogen is available when the plants need it most, from late June through mid-August. This strategy also improves the chances that nitrogen will be available to the crop during extended dry weather. Results from Goodhue and Winona counties clearly show that delayed nitrogen applications result in either yield decreases or no yield increase.

A three-year study conducted on a Mount Carroll silt loam in Goodhue County with band-applied (2 inches deep midway between 30-inch rows) ammonium sulfate showed a 5 bu/A corn yield decrease when applied at the 8-leaf stage compared to application at planting **(Table 2)**. An 11 bu/A decrease was noted with the 8-leaf application in a year when an extended dry period followed the nitrogen application. Moreover, the sidedress applications resulted in substantially higher amounts of NO_3-N remaining in the top 5 feet of soil after harvest. Unfortunately, that nitrate level had decreased by 60 percent by the following May because of heavy fall and early spring rainfall.

A recent continuous corn study (1987-90) conducted on a Port Byron silt loam in Goodhue County showed no yield advantage for either split (preplant and sidedress) or single sidedress applications of anhydrous ammonia **(Table 3)**. Soil water obtained from a 5-foot depth after harvest in 1990 showed a significantly higher NO_3-N concentration with the 6-leaf application compared to the preplant application.

Somewhat similar results were found in a continuous corn study in Winona County **(Table 4)**. However, there were major differences in the sites: The Winona study was conducted on a lower-organic-matter soil (Seaton silt loam) with a previous history of alfalfa and dairy manure. The Winona County site was much less responsive to nitrogen with a four-year yield increase of only about 30 bu/A. Similar to Olmsted (Table 1) and Goodhue (Table 3) counties, split applications of nitrogen did not increase yields but did increase NO_3-N concentrations in the water. Sidedressing all of the nitrogen at the 6-leaf stage was too late, resulting in somewhat lower yields.

Table 1
Effect of nitrogen treatments on the 1990 and 4-year average corn yield and NO_3-N concentration in the soil water at 5 feet in Olmsted Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time/Method	Grain Yield (bu/A) 1990	'87-90	Nitrate-N Conc. in Soil Water[2/] (ppm)
0	—	76	84	1
75	Spr. preplant	145	156	11
150	Spr. preplant	155	172	29
225	Spr. preplant	156	167	43
150	Fall	145	169	43
150	Fall + N-Serve	148	169	50
75+75	Spr. + SD (9-lf)	154	168	47

1/ From Randall et al.
2/ Fall 1990

Table 2
Effect of application time on the 1982-84 average corn yield and residual nitrate-N found in the 0 to 5-foot soil profile after harvest in Goodhue Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time	3-yr Average Yield (bu/A)	3-yr Average Residual NO_3-N in Profile (lb N/A)
0	—	94	156
135	Planting	127	206
135	8-leaf stage	122	283

1/ From Jokela and Randall

Table 3
Effect of nitrogen application time and rate on the 1987-90 average corn yield and NO_3-N concentration in the soil water at a 5-foot depth in Goodhue Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time /Method	4-yr Average Yield (bu/A)	Nitrate-N Concentration in Soil Water[2/] (ppm)
0	—	89	6
50	Preplant (PP)	129	ND[3/]
100	PP	143	22
150	PP	147	39
200	PP	148	ND
50+50	PP + SD (6-lf)	142	ND
50+100	PP + SD (6-lf)	146	ND
100+50	PP + SD (6-lf)	148	ND
100	SD (6-lf)	140	ND
150	SD (6-lf)	146	62

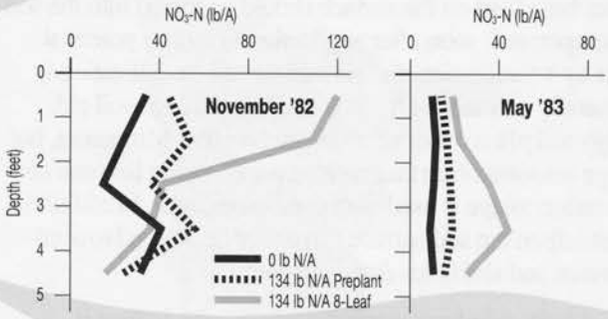
1/ From Randall et al.
2/ Fall 1990
3/ ND—not determined

Table 4
Effect of nitrogen application time and rate on the 1987-90 average corn yield and NO_3-N concentration in the soil water in Winona Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time /Method	4-yr Average Yield (bu/A)	Nitrate-N Concentration in Soil Water at 5 feet[2/] (ppm)
0	—	127	13
50	Preplant (PP)	153	ND[3/]
100	PP	156	30
150	PP	158	34
50+50	PP + SD (9-lf)	157	ND
50+100	PP + SD (9-lf)	160	64
150	SD (6-lf)	152	ND

1/ From Randall et al.
2/ Fall 1990
3/ ND—not determined

Figure 2
Effect of nitrogen rate and time of application on the NO_3-N in the soil profile in 1982-83



■ **Inject or incorporate sidedress applications of urea and UAN to a minimum depth of 4 inches.**

Incorporation of urea and urea-containing fertilizers reduces the potential for loss by volatilization. In addition, materials injected or incorporated to a 4-inch depth are more likely to reach roots under dry conditions. Surface-applied materials are less likely to reach roots under dry conditions, and yields may suffer.

Nitrogen not absorbed by plants often remains in the soil after harvest and thus is highly susceptible to leaching loss before the next year's crop can use it. Strong evidence of this occurred in 1982 and 1983 where substantial amounts of NO_3-N remained in the soil after harvest when the sidedress nitrogen was band-applied 2 inches deep at the 8-leaf stage **(Figure 2)**. Most of this residual nitrate was not found in the 5-foot profile the following May.

■ **Use a nitrification inhibitor with preplant nitrogen applications if soils are poorly drained and soil moisture levels are high near the surface.**

Denitrification losses can be substantial on soils that remain saturated for extended periods of time. But that's not a good reason to apply extra nitrogen as "insurance" that enough will remain. Nitrification inhibitors (e.g., N-Serve) limit denitrification and leaching by keeping nitrogen in the ammonium form for a longer time. Leaching and/or denitrification are most likely to occur in:

- wet, poorly drained shallow loess soils over glacial till,
- sandy outwash soils, and
- alluvial soils containing sand lenses along river bottoms in southeastern Minnesota.

See *Nitrification Inhibitors and Use in Minnesota* AG-FO-3774, for detailed information on this topic.

■ **Minimize direct movement of surface-water runoff to sinkholes.**

When nutrient-laden surface water runs directly into sinkholes, water quality over a large region can be harmed. Movement of those nutrients can be minimized through erosion control, berms, and filter strips around sinkholes. In addition, incorporating fertilizer and manure into the soil, rather than leaving them on top, greatly reduces chances that they will wash into sinkholes and contaminate the groundwater.

See *Best Management Practices for Nitrogen Use Statewide in Minnesota* AG-FO-6125 for a complete list of references.

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AG-FO-6127-C
1993

BEST MANAGEMENT PRACTICES FOR NITROGEN USE IN SOUTH-CENTRAL MINNESOTA

by G. W. Randall, Soil Scientist, Southern Experiment Station, and
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Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

The research-based Best Management Practices (BMPs) outlined in this bulletin are economically and environmentally sound. It is strongly suggested that farmers adopt them voluntarily. By following these recommendations, agriculture can avoid the threat of fertilizer regulations and enjoy a more profitable and better community.

These nitrogen BMPs were assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by the MDA.

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Introduction

Nitrogen (N) is an essential plant nutrient that is applied to Minnesota crops in greater quantity than any other fertilizer. In addition, vast quantities of nitrogen are contained in the ecosystem, including in soil organic matter. Biological processes that convert nitrogen to its mobile form, nitrate (NO_3), occur continuously in the soil system. (For greater detail see *Understanding Nitrogen in Soils* AG-FO-3770.) Unfortunately, nitrates can be leached from the rooting part of the soil. To minimize losses to surface- and groundwater, management guidelines have been developed.

Best Management Practices (BMPs) for nitrogen are broadly defined as "economically sound, voluntary practices that are capable of minimizing nutrient contamination of surface- and groundwater." The BMPs recommended here are based upon research, particularly at the University of Minnesota and other land-grant universities, and upon practical considerations.

The BMPs are based, in part, upon the concept of total nitrogen management, which accounts for all forms of on-farm nitrogen in the development of crop management plans. BMPs were developed to be adopted on a statewide as well as a regional basis. Those developed for the unique soil and climatic conditions of south-central Minnesota refine the recommendations of the statewide BMPs.

Statewide Nitrogen BMPs

Statewide BMPs are applicable to all crops and farming practices. They are based upon the concept that accurate determination of crop nitrogen needs is essential for profitable and environmentally sound nitrogen management decisions. The statewide BMPs shown below are described in greater detail in *Best Management Practices for Nitrogen Use Statewide in Minnesota* AG-FO-6125.

- Set realistic yield goals.
- Develop and use a comprehensive record-keeping system for field-specific information.
- Adjust nitrogen rate according to soil organic matter content, previous crop and manure applications.
- Use a soil nitrate test where appropriate.
- Use prudent manure management to optimize nitrogen credit.
  - –Test manure for nutrient content.
  - –Calibrate manure application equipment.
  - –Apply manure uniformly throughout a field.
  - – Injection of manure is preferable, especially on strongly sloping soils.
  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

Figure 1
Eighteen-county area of south-central Minnesota for specific BMPs for nitrogen.

BMPs for South-Central Minnesota

South-central Minnesota is characterized by fine-textured soils formed in glacial till and sediments. Most south-central soils have naturally poor-to-moderate internal drainage and are tiled to improve drainage. Average annual precipitation in the region is 25 to 31 inches. Crops are predominantly corn and soybeans. BMPs for the area shown in **Figure 1** (Blue Earth, Brown, Carver, Dodge, Faribault, Freeborn, LeSueur, Martin, McLeod, Meeker, Mower, Nicollet, Rice, Scott, Sibley, Steele, Waseca and Watonwan counties) have been developed based on field research conducted in some of those counties.

The nitrogen BMPs for south-central Minnesota include:

- **Applications of nitrogen before spring planting are highly recommended.**

University research conducted in this region indicates that spring nitrogen applications are used more efficiently by the crop and result in decreased nitrate loss to tile line drainage than fall applications. The potential for nitrogen loss by denitrification (nitrate converted to a gas and lost to the atmosphere) is also reduced with spring application.

Research results obtained at Waseca support this BMP. Application of ammonium sulfate in early November resulted in significantly lower corn yields than spring applications (**Table 1**). Moreover, NO_3-N loss out of the tile lines was markedly higher with the fall applications. Fall application of urea would be expected to give similar results.

Table 1
Corn yields and NO_3-N lost thru the tile lines as influenced by nitrogen rate and time of application at Waseca.[1/]

Nitrogen Treatment Rate (lb N/A)	Time	1978-82 Yield Avg (bu/A)	Annual NO_3-N lost thru tile lines (lb N/A)
0	—	66	7
120	Fall	131	27
120	Spring	150	19
180	Fall	160	34
180	Spring	168	26

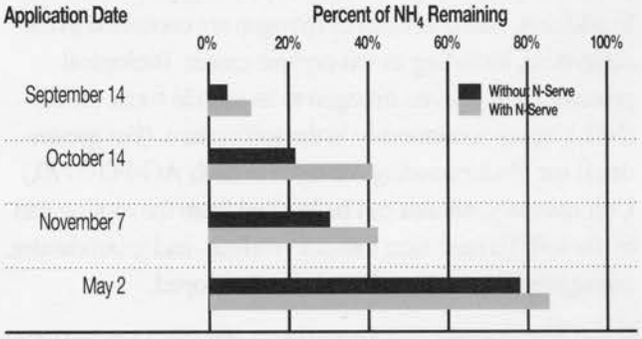
1/ From Randall et al.

■ **If some nitrogen is to be fall-applied, delay application until the soil temperature is below 50° F at a 6-inch depth. Anhydrous ammonia is encouraged if fall applications are made.**

Delaying application until soil temperatures reach 50° F will minimize nitrification; this will reduce, but not eliminate, the potential for nitrogen loss. Research also indicates that anhydrous ammonia is the most efficient nitrogen form for fall use in this region.

Figure 2 shows the impact of the time of anhydrous ammonia application and a nitrification inhibitor on the proportion of ammonium (NH_4) remaining in the soil. Soil samples were taken at Waseca on May 10 through the ammonia band from anhydrous ammonia applied the previous fall and the previous week. Less than 50 percent of the original NH_4 applied in fall remained in early May, regardless of application time or inhibitor use. Ammonia applied at soil temperatures above 50° F was almost completely converted to NO_3 by early May. At Waseca, long-term average soil temperature reaches 50° F at 6 inches on October 13, but because of temperature fluctuations does not remain below 50° F until October 29. Because warmer soil temperatures enhance the conversion to nitrate and thus increase the potential for leaching and/or denitrification losses, anhydrous ammonia should not be applied until late October.

Figure 2
Percent ammonium remaining in the anhydrous ammonia fertilizer band at Waseca on May 10.[1/]



1/ From Malzer

■ **Spring preplant applications of anhydrous ammonia or urea are encouraged. Broadcast urea and preplant application of UAN should be incorporated within three days of application.**

For preplant applications, use of ammonium forms of nitrogen fertilizer (anhydrous ammonia and urea) instead of nitrate forms reduces the potential for nitrogen leaching loss.

Studies at Waseca in 1981 and 1982 compared fall application of anhydrous ammonia and urea, with and without N-Serve, to spring application of the same. Rainfall from April to September ranged from 4.8 inches above normal in 1981 to 0.8 inch below normal in 1982. Two-year average corn yields following soybeans, shown in **Table 2**, indicate the following:

1) Urea was inferior to anhydrous ammonia when fall-applied.

2) Spring application of urea was superior to fall application.

3) A slight yield advantage (4.5 bushels per acre) for spring-applied anhydrous ammonia compared to a fall application was found when averaged across N-Serve treatments.

Table 2
Average corn grain yield as influenced by N source, time of application and N-Serve at Waseca in 1981-82.[1/]

Nitrogen Application Source	N-Serve	Average Corn Yield (bu/A) Time of Application Fall	Spring
Urea	No	157	164
Urea	Yes	155	167
An. ammonia	No	162	168
An. ammonia	Yes	170	173
None	—	104	

1/ From Malzer and Randall

Urea and UAN that are broadcast on the surface should be mixed into the soil (incorporated) soon after application to reduce potential loss by volatilization and surface runoff. Volatilization is generally accelerated by crop residue and high soil pH. High soil pH is common in south-central Minnesota and large amounts of surface residue are becoming more common due to conservation tillage, so urea should be readily incorporated.

■ Apply sidedress applications to corn before it is 12 inches high.

Limiting sidedress applications to corn shorter than 12 inches will help ensure that nitrogen is available when the plants need it most, from late June through mid-August. This strategy also improves the chances that nitrogen will be available to the crop during extended dry weather. Research results from Waseca frequently show either yield decreases or no yield increase with delayed nitrogen applications.

A three-year study conducted under dry July-August conditions on a Webster clay loam in Waseca County with band-applied (2 inches deep midway between 30-inch rows) ammonium sulfate showed an 8 bu/A corn yield decrease when applied at the 8-leaf stage compared to application at planting **(Table 3)**. Moreover, sidedress applications resulted in substantially higher amounts of residual NO_3-N remaining in the top 5 feet of soil after harvest. Unfortunately, that nitrate level had decreased by 50 to 65 percent by the following May because of heavy fall and early spring rainfall.

Table 3
Effect of application time on the 1982-84 average corn yield and residual nitrate-N found in the 0 to 5-foot soil profile after harvest in Waseca Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time	3-Yr. Avg. NO_3-N in Profile (lb N/A)	3-Yr. Avg. Residual Yield (bu/A)
0	—	52	113
90	Planting	86	132
90	8-leaf stage	78	199

1/ From Jokela and Randall

■ Inject or incorporate sidedress applications of urea and UAN to a minimum depth of 4 inches.

Incorporation of urea and urea-containing fertilizers reduces the potential for loss by volatilization. In addition, materials injected or incorporated to a 4-inch depth are more likely to reach roots under dry conditions. Surface-applied materials are less likely to reach roots under dry conditions, and yields may suffer. Nitrogen not absorbed by plants often remains in the soil after harvest and thus is highly susceptible to leaching loss before the next year's crop can use it.

Results similar to those shown in Table 3 were found in 1981-83 for ridge-tilled continuous corn. Three-year average corn yields were 8 to 12 bu/A lower when either urea or UAN were sidedress-applied at the 8-leaf stage and cultivated in compared to sidedress-applied anhydrous ammonia **(Table 4)**. Ammonia was injected 7 inches deep while cultivation only incorporated the UAN and urea about 2 inches. From these data it is not possible to determine whether the urea and UAN remained unavailable because of their position in the top few inches or whether volatilization may have occurred also on this site with its high pH and high surface residue. Nonetheless, significant yield decreases occurred with the late-sidedress, cultivated-in applications.

Table 4
Average corn yield as influenced by nitrogen source and time/method of application in a ridge-plant system at Waseca.[1/]

Nitrogen Source[2/]	Corn Yield (bu/A) Time/Method: Preplant	Sidedress (8-lf)
UAN	145	133
Urea	146	129
An. Ammonia	146	141

1/ From Randall and Langer

2/ 150 lb N/A; 0 lb N/A = 91 bu/A

Split application of nitrogen, with the second portion applied just before layby, is often suggested as being an ideal nitrogen management practice. Results from a three-year study (1985-87) conducted at Waseca showed substantial yield losses when two-thirds of the nitrogen was applied as UAN at the 7-leaf stage and incorporated with a cultivator **(Table 5)**. Split applications of nitrogen with anhydrous ammonia injected 7 inches deep at the 7-leaf stage on this Webster clay loam soil gave yields equal to a single, preplant application of anhydrous ammonia.

Table 5
Corn yield as affected by split applications of nitrogen at Waseca.[1/]

Time: Preplant	Sidedress (7-lf)	Corn Yield (bu/A) Total Rate (lb N/A): 120	180
All as An. Ammonia	None	138	150
1/3 as UAN	2/3 as An. Ammonia	144	151
1/3 as UAN	2/3 as UAN	113	132

0 lb N/A = 68 bu/A

1/ From Randall and Kelly

■ **Use a nitrification inhibitor with fall and preplant nitrogen applications if soils are poorly drained and soil moisture levels are high near the surface.**

Denitrification losses can be substantial on soils that remain saturated for extended periods of time. But that's not a good reason to apply extra nitrogen as "insurance" that enough will remain. Nitrification inhibitors (e.g., N-Serve) limit denitrification and leaching by keeping nitrogen in the ammonium form for a longer time. Situations in south-central Minnesota where a nitrification inhibitor is likely to affect corn yield include poorly drained soils that are very wet at the time of application, especially in the fall, and the scattered sandy soils throughout the region.

Tile drainage plots on a Webster clay loam at Waseca allow the evaluation of nitrogen management practices from both agronomic and environmental viewpoints. Results obtained in 1990, when rainfall for April-September exceeded normal by 6.7 inches, show highest NO_3-N concentrations in the tile water and greatest NO_3-N losses with the fall-applied anhydrous ammonia without N-Serve (**Table 6**). The addition of N-Serve to the fall anhydrous ammonia reduced NO_3-N concentrations slightly, but not to the level of the spring and split applications without N-Serve. Corn yields did not vary greatly among the four nitrogen treatments.

Table 6
Flow-weighted NO_3-N concentration in the water, NO_3-N losses and grain yield in 1990 as influenced by time of nitrogen application to corn following soybeans.[1/]

Nitrogen Application[2/] Time	N-Serve	Average Flow-Weighted NO_3-N Conc. (ppm)	Total NO_3-N Loss Thru Tiles (lb/A)	Corn Yield (bu/A)
Fall (Oct.)	No	35	109	146
Fall (Oct.)	Yes	30	69	146
Spr. (Apr.)	No	27	60	142
Split (Apr + Jun)	No	28	74	151

1/ From Randall et al.

2/ As anhydrous ammonia at 135 lb/A.

Under very wet conditions in 1991, when an all-time April-September rainfall record was set at 35.4 inches (13.2 inches above normal), NO_3-N concentrations and losses in the tile drainage water were markedly lower for the spring and split treatments compared to the fall treatments (**Table 7**). Adding N-Serve to the fall-applied (Oct. 26.) anhydrous ammonia resulted in lower NO_3-N concentrations in the tile water in May-July and a 21 bu/A yield increase. Highest grain yields were obtained with spring applications and were 8 to 10 bu/A more than the late fall application with N-Serve. These data illustrate the link between high NO_3-N concentrations in rivers in very wet springs in south-central Minnesota and fall application of nitrogen.

Table 7
Cropping season NO_3-N losses through tile lines and corn yield under very wet conditions (1991) as influenced by time of nitrogen application to corn following soybeans.[1/]

	Time of Application[2/]			
Parameter	Fall No N-S	Fall N-Serv	Spr No N-S	Spr + SD No N-S
NO_3-N Loss (lb/A)	72	69	52	54
Flow-weighted NO_3-N Conc. (ppm)				
April	16	16	14	14
May	23	20	16	16
June	34	27	17	16
July	24	22	14	14
August	14	14	9	11
Corn yield (bu/A)	122	143	151	153

1/ From Randall et al.

2/ As anhydrous ammonia at 135 lb N/A.

These data for south-central Minnesota clearly indicate that the success of fall application is related to rainfall during the growing season. When spring rainfall ranges from below normal to slightly above normal, fall-applied anhydrous ammonia appears to be a sound practice, especially when N-Serve is used. Under wetter-than-normal spring conditions, spring application of anhydrous ammonia is clearly superior to fall application even if N-Serve is added with the fall treatment. (For greater detail on use of nitrification inhibitors see *Nitrification Inhibitors and Use in Minnesota* AG-FO-3774.)

■ **Carefully manage nitrogen applications on soils characterized by a high leaching potential.**

1) Do not apply fertilizer nitrogen in the fall to coarse-textured (sandy) soils.

Although sandy soils are not common in south-central Minnesota, it is extremely important for farmers to practice high-level management of their nitrogen inputs on such soils.

2) When soils have a high leaching potential, application of nitrogen in a sidedress or split-application program is preferred. Use a nitrification inhibitor on labeled crops with early sidedressed nitrogen.

Data obtained in a three-year study on a coarse-textured soil at Becker indicates a clear advantage for sidedress and split applications of nitrogen compared to a single preplant application (**Table 8**). Under these conditions, corn yields were increased by N-Serve added to the sidedress and split applications at rates up through 150 lb N/A. (For greater detail on BMPs for coarse-textured soils see *Best Management Practices for Nitrogen Use on Irrigated, Coarse-Textured Soils* AG-FO-6131.)

Table 8
Three-year average corn grain yields as influenced by time of application and N-Serve at Becker, Minnesota.[1/]

Nitrogen Treatment		3 yr. Avg. Corn Yields (bu/A) Rate (lb N/A)			
Application Time	Inhibitor	0	75	150	225
Preplant	None	82	124	147	158
Preplant	N-Serve		132	167	180
8-Leaf	None		147	179	193
8-Leaf	N-Serve		158	186	191
2/3 preplant+	None		132	159	191
1/3 at 12-leaf	N-Serve		144	180	191

1/ From Malzer et al.

Related Publications

AG-FO-6125	Best Management Practices for Nitrogen Use Statewide in Minnesota
AG-FO-6126	Best Management Practices for Nitrogen Use in Southeastern Minnesota
AG-FO-6128	Best Management Practices for Nitrogen Use in Southwestern and West-Central Minnesota
AG-FO-6129	Best Management Practices for Nitrogen Use in East-Central and Central Minnesota
AG-FO-6130	Best Management Practices for Nitrogen Use in Northwestern Minnesota
AG-FO-6131	Best Management Practices for Nitrogen Use on Irrigated, Coarse-Textured Soils
AG-FO-5880	Fertilizing Cropland With Dairy Manure
AG-FO-5879	Fertilizing Cropland With Swine Manure
AG-FO-5881	Fertilizing Cropland With Poultry Manure
AG-FO-5882	Fertilizing Cropland With Beef Manure
AG-FO-5883	Self-assessment Worksheets for Manure Management Plans
AG-FO-3790	Fertilizing Corn in Minnesota
AG-FO-3813	Fertilizing Soybeans in Minnesota
AG-FO-3814	Fertilizing Alfalfa in Minnesota
AG-FO-3773	Fertilizing Barley in Minnesota
AG-FO-3772	Fertilizing Wheat in Minnesota
AG-FO-3770	Understanding Nitrogen in Soils
AG-FO-3774	Nitrification Inhibitors and Use in Minnesota
AG-FO-3769	Providing Proper N Credit for Legumes
AG-FO-2274	Using the Soil Nitrate Test for Corn in Minnesota
AG-FO-2392	Managing Nitrogen for Corn Production on Irrigated Sandy Soils
AG-FO-0636	Fertilizer Urea
AG-FO-3073	Using Anhydrous Ammonia in Minnesota
AG-FO-6074	Fertilizer Management for Corn Planted in Ridge-till or No-till Systems
AG-FO-3553	Manure Management in Minnesota

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- Set realistic yield goals.
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- Adjust nitrogen rate according to soil organic matter content, previous crop and manure applications.
- Use a soil nitrate test where appropriate.
- Use prudent manure management to optimize nitrogen credit.
  - –Test manure for nutrient content.
  - –Calibrate manure application equipment.
  - –Apply manure uniformly throughout a field.
  - –Injection of manure is preferable, especially on strongly sloping soils.
  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

Figure 1
Twenty-one-county area of southwestern and west-central Minnesota for specific BMPs for nitrogen.

BMPs for Southwestern and West-Central Minnesota

Southwestern and west-central Minnesota is an area characterized by soils of medium-to-fine texture that were formed in glacial till. Many soils in the region have naturally poor-to-moderate internal drainage and consequently are tiled to improve drainage. Average annual precipitation is less than 26 inches. Crops are dominated by corn, soybeans and small grains. BMPs for counties shown in **Figure 1** (Big Stone, Chippewa, Cottonwood, Douglas, Grant, Jackson, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Pope, Redwood, Renville, Rock, Stevens, Swift, Traverse and Yellow Medicine) have been developed based on field research conducted in some of those counties.

The nitrogen BMPs for southwestern and west-central Minnesota include:

- **Use a soil nitrate test from either a 2- or 4-foot depth sample to determine nitrogen needs. Soil samples should be taken in early spring (preferably) or in the fall after the soil temperature is below 50° F at the 6-inch depth.**

The soil nitrate test has been recommended as an excellent nitrogen management tool for crop producers in western Minnesota for a number of years. A 2-foot depth is recommended for corn and small grains while a 4-foot sample is preferred for sugar beets. When this test is used, nitrogen fertilizer recommendations are based on the amount of residual or carryover nitrate-nitrogen (NO_3-N) in the soil and are adjusted for previous crop and yield goal. This test is not recommended if the previous crop was alfalfa.

A primary benefit of a soil nitrate test is to identify those fields that will not respond to additional fertilizer nitrogen because of high levels of residual nitrates. Causes of nitrate carryover include:

- excess previous nitrogen applications,
- unused nitrogen because of poor crop growth, and
- a history of high rates of manure application.

Identifying such sites will return a direct economic savings to the farmer and will reduce the probability of high nitrate losses to the environment. Further detail on the soil nitrate test can be obtained from *Fertilizing Corn in Minnesota* AG-FO-3790.

The benefits from using the soil NO_3-N test to provide fertilizer nitrogen recommendations in western Minnesota can be readily seen from data collected at Lamberton in 1990 (**Table 1**). Soil samples taken in April to a 5-foot depth and analyzed for NO_3-N showed substantially more residual NO_3 in the profile following corn compared to following soybeans. Based on NO_3-N in the top 4 feet and a yield goal of 140 bu/A, fertilizer nitrogen recommendations of 31 and 116 pounds of nitrogen per acre (lb N/A) for continuous corn and corn following soybeans, respectively, were applied. This amount for continuous corn was 120 lb N/A less than the recommendation without the soil NO_3-N test. Corn yields for the two cropping systems were not different. Nitrate-N concentrations in the tile water reflected the accumulation of NO_3 in the soil profile for continuous corn especially in May.

Table 1
Residual soil NO_3-N, corn yield and NO_3-N losses from tile lines as influenced by continuous corn compared to a corn-soybean rotation at Lamberton in 1990.[1/]

Parameter	1989 Crop: 1990 Crop:	Corn Corn	Corn Soybeans	Soybeans Corn
Nitrate-N in top 5 feet of soil (lb/A)		168	136	75
N recommended & applied based on soil NO_3-N (lb N/A)		31	0	116
Rate recommended without soil test (lb N/A)		150		120
Corn yield (bu/A)		120		123
NO_3-N conc. (ppm)				
May		27	20	16
June		34	33	27

1/ From Randall et al.

Table 2
Corn grain yield response to fall- and spring-applied nitrogen in a 31-year study (1961-1991) at Lamberton.[1/]

N Treatment[2/]		Grain Yield (bu/A)			
		1991		31-yr Average	
Source	Rate (lb N/A)	Fall	Spring	Fall	Spring
—	0	77		67	
Urea	40	119	119	89	95
"	80	136	142	105	110
"	160	159	—	114	—
Am. Nitrate	40	102	117	86	97
"	80	137	147	106	109
"	160	162	—	114	—

1/ From Fuchs et al.

2/ Fall applications were broadcast and plowed down. Spring applications were broadcast and incorporated with secondary tillage just prior to planting

■ **Spring preplant applications of anhydrous ammonia or urea are recommended. Broadcast urea and preplant application of UAN should be incorporated within three days of application.**

The southwestern and west-central regions of Minnesota experience lower average annual precipitation than much of the rest of the state. Consequently, fall nitrogen applications have less potential to leach to groundwater than in many other regions of the state. However, spring applications may result in higher nitrogen use efficiency than fall applications.

One of the longest running studies in the nation has compared fall versus spring application of urea and ammonium nitrate (AN) at Lamberton. Results from this continuous corn study on a Webster clay loam show that spring application of urea increased yields by 5 to 6 bu/A over fall application (**Table 2**). Yields with spring-applied AN were 3 to 11 bu/A higher compared to fall application. In 1991, when rainfall was slightly above normal, yields with urea were generally unaffected by time of application while yields from fall-applied AN were 10 to 15 bu/A lower than from spring application. These results confirm why fall application of nitrate-based fertilizers (AN and UAN) is not recommended. The 5 to 6 bu/A advantage

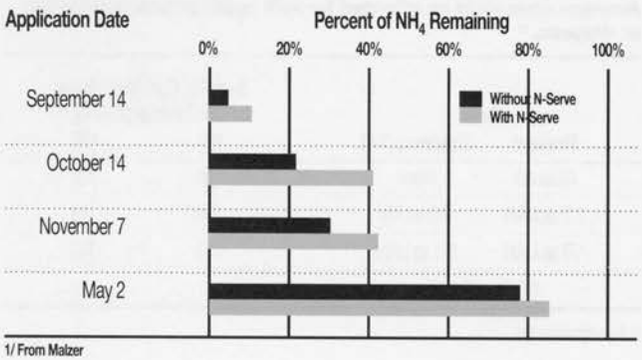
for spring-applied urea over a 31-year period also suggests that anhydrous ammonia, a nitrogen source less susceptible to loss, would be a better choice than urea for fall application in southwestern Minnesota.

Urea and UAN that are broadcast on the soil surface should be incorporated soon after application to reduce the potential for loss due to ammonia volatilization and surface runoff. Crop residue and high soil pH will increase volatilization of surface-applied urea to the atmosphere. Because high soil pH is common in southwestern and west-central Minnesota and high amounts of surface residue are becoming more common due to conservation tillage, urea and UAN should be incorporated within three days.

- **In situations where fall nitrogen applications are used, delay application until the soil temperature is below 50° F at 6-inch depth. Use anhydrous ammonia or urea sources of nitrogen; UAN should not be fall-applied. [Reminder: Nitrogen should not be fall-applied to coarse-textured (sandy) soils.]**

Delaying application until soil temperatures reach 50° F will minimize nitrification. This will reduce, but not eliminate, the potential for nitrogen loss. The impact of time of anhydrous ammonia application and use of a nitrification inhibitor on ammonium (NH_4) proportions remaining in the soil can easily be seen in **Figure 2**. Soil samples were taken through the ammonia band on May 10 from anhydrous ammonia applied the previous fall and the previous week at Waseca. Less than 50 percent of the original NH_4 remained in early May from all of the fall applications regardless of application time or inhibitor use. Ammonia applied at soil temperatures above 50° F was almost completely converted to NO_3 by early May. Long-term average 6-inch soil temperature reaches 50° F on October 3 at Morris and October 13 at Lamberton but due to temperature fluctuations does not remain below 50° F until October 15 and 30 at the two locations, respectively. Because warmer soil temperatures enhance the conversion to nitrate and thus increase the potential for leaching and/or denitrification losses, anhydrous ammonia should not be applied until late October.

Figure 2
Percent ammonium remaining in the anhydrous ammonia fertilizer band at Waseca on May 10.1/



1/ From Malzer

A 10-year study (1973-82) at Morris compared fall versus spring application of urea for continuous corn grown on a Doland silt loam. Results shown in **Table 3** indicate no yield difference between fall and spring applications. Yields were optimized at the 80-lb nitrogen rate.

Table 3
Average corn grain yield as influenced by time of urea application in a 10-year study at Morris.

Nitrogen Treatment Rate (lb N/A)	Time	10-yr Average Corn Yield (bu/A)
0	—	82
80	Fall	101
80	Spring	99
120	Fall	101
120	Spring	98

Nitrification inhibitors are generally not recommended for use in southwestern and west-central Minnesota because of the drier conditions and reduced potential for leaching and/or denitrification. A two-year study with anhydrous ammonia applied at 100 lb N/A at Lamberton and 80 lb N/A at Morris was conducted to evaluate fall and spring applications with and without N-Serve. The data shown in **Table 4** indicate no consistent yield improvement with N-Serve even when applied as early as late September at Morris.

Situations where a yield response to a nitrification inhibitor is most likely to occur include fall fertilization of very wet, poorly drained soils and spring fertilization of sandy soils scattered throughout the region.

Table 4
Influence of time of nitrogen application and N-Serve on average corn grain yield at Lamberton and Morris in 1978-79.1/

Time of Application2/	N-Serve	Grain Yield (bu/A) Lamberton	Morris
Mid-Fall	No	124	114
	Yes	122	109
Late Fall	No	132	112
	Yes	130	120
Spring	No	127	114
	Yes	130	109

1/ From Malzer, et al.
2/ Mid-fall was Oct. 3 and Sept. 26; late fall was Nov. 1 and Oct. 24; and spring was May 8 and May 19 for Lamberton and Morris, respectively.

■ **Apply sidedress applications to corn before it is 12 inches high.**

Limiting sidedress applications to corn shorter than 12 inches will help ensure nitrogen availability when plants need it most, from late June through mid-August. This strategy also improves the chances that nitrogen will be available to the crop during extended dry weather. Research results from southern Minnesota frequently show that delayed nitrogen applications (after the 12-inch stage) result in either yield decreases or no yield increase.

A three-year study conducted under dry July-August conditions on a Webster clay loam in Waseca Co. with band-applied (2 inches deep midway between 30-inch rows) ammonium sulfate showed an 8 bu/A corn *yield decrease* when applied at the 8-leaf stage compared to at planting **(Table 5)**. Moreover, sidedress applications resulted in substantially higher amounts of residual NO_3-N remaining in the 5-foot soil profile after harvest. Unfortunately, that nitrate level had decreased by 50 to 65 percent by the following May because of heavy fall and early spring rainfall.

■ **Inject or incorporate sidedress applications of urea and UAN to a minimum depth of 4 inches.**

Incorporating urea and urea-containing fertilizers reduces the potential for loss by volatilization. In addition, materials injected or incorporated to a 4-inch depth are more likely to reach roots under dry conditions. Surface-applied materials are less likely to reach roots under dry conditions, and yields may suffer.

This is especially true for corn producers in southwestern and west-central Minnesota where rainfall is often inadequate to move surface-applied nitrogen down into the active root zone. Injection or incorporation of sidedressed nitrogen to a 4-inch depth increases the chance that nitrogen will be available when it is needed most. Nitrogen that does not reach roots often remains in the soil after harvest and is highly susceptible to leaching loss before the next year's crop can use it.

Results similar to those shown in Table 5 were found in 1981-83 for ridge-tilled continuous corn. Three-year average corn yields were 8 to 12 bu/A lower when either urea or UAN were sidedress-applied at the 8-leaf stage (15 to 18 inches tall) and incorporated compared to sidedress-applied anhydrous ammonia **(Table 6)**. The ammonia was injected 7 inches deep while cultivation incorporated the UAN and urea only about 2 inches. From these data it is not possible to determine whether the urea and UAN remained positionally unavailable in the top few inches or whether volatilization may have occurred on this high-pH, high-surface-residue site. Nonetheless, significant yield decreases occurred with the late-sidedress, cultivated-in applications.

Split application of nitrogen, with the second portion applied just before layby, is often suggested as an ideal nitrogen management practice. A three-year study (1985-87) conducted at Waseca showed substantial yield losses when two-thirds of the nitrogen was applied as UAN at the 7-leaf stage (14 to 16 inches tall) and incorporated (about 2 inches deep) with a cultivator **(Table 7)**. Split applications of nitrogen with anhydrous ammonia injected 7 inches deep at the 7-leaf stage on this Webster clay loam soil gave yields equal to a single, preplant application of anhydrous ammonia.

Table 5
Effect of application time on the 1982-84 average corn yield and residual NO_3-N found in the 0- to 5-foot soil profile after harvest in Waseca Co.[1/]

Nitrogen Treatment Rate (lb N/A)	Time	3-yr Avg. Yield (bu/A)	3-yr Avg. Residual NO_3-N in Profile (lb/ A)
0	—	52	113
90	Planting	86	132
90	8-leaf stage	78	199

1/ From Jokela and Randall

Table 6
Average corn yield as influenced by nitrogen source and time/method of application in a ridge-plant system at Waseca.[1/]

Nitrogen Source[2/]	3-yr Avg. Corn Yield (bu/A) Preplant	Sidedress (8-lf)
UAN	145	133
Urea	146	129
Anhydrous Ammonia	146	141

1/ From Randall and Langer
2/ 150 lb N/A; 0 lb N/A = 91 bu/A

Table 7
Average corn yield as affected by split applications of nitrogen at Waseca.[1/]

Time Preplant	Sidedress (7-lf)	3-yr Avg. Corn Yield (bu/A) Total Rate (lb N/A) 120	180
All as AA	None	138	150
1/3 as UAN	2/3 as AA	144	151
1/3 as UAN	2/3 as UAN	113	132
0 lb/A = 68 bu/A			

1/ From Randall and Kelly

Related Publications

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AG-FO-6129-B
1993

BEST MANAGEMENT PRACTICES FOR NITROGEN USE IN EAST-CENTRAL AND CENTRAL MINNESOTA

by M. A. Schmitt, Extension Specialist, Dept. of Soil Science, and G. W. Randall, Soil Scientist, Southern Experiment Station, University of Minnesota

Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

The research-based Best Management Practices (BMPs) outlined in this bulletin are economically and environmentally sound. It is strongly suggested that farmers adopt them voluntarily. By following these recommendations, agriculture can avoid the threat of fertilizer regulations and enjoy a more profitable and better community.

These nitrogen BMPs were assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by the MDA.

MINNESOTA EXTENSION SERVICE

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Introduction

Nitrogen (N) is an essential plant nutrient that is applied to Minnesota crops in greater quantity than any other fertilizer. In addition, vast quantities of nitrogen are contained in the ecosystem, including in soil organic matter. Biological processes that convert nitrogen to its mobile form, nitrate (NO_3), occur continuously in the soil system. (For greater detail see *Understanding Nitrogen in Soils* AG-FO-3770.) Unfortunately, nitrates can be leached from the rooting part of the soil. To minimize losses to surface- and groundwater, management guidelines have been developed.

Best Management Practices (BMPs) for nitrogen are broadly defined as "economically sound, voluntary practices that are capable of minimizing nutrient contamination of surface- and groundwater." The BMPs recommended here are based upon research, particularly at the University of Minnesota and other land-grant universities, and upon practical considerations.

The BMPs are based, in part, upon the concept of total nitrogen management, which accounts for all forms of on-farm nitrogen in the development of crop management plans. BMPs were developed to be adopted on a statewide as well as a regional basis. Those developed for east-central and central Minnesota refine the recommendations of the statewide BMPs.

Statewide Nitrogen BMPs

Statewide BMPs are applicable to all crops and farming practices. They are based upon the concept that accurate determination of crop nitrogen needs is essential for profitable and environmentally sound nitrogen management decisions. The statewide BMPs shown below are described in greater detail in *Best Management Practices for Nitrogen Use Statewide in Minnesota* AG-FO-6125.

- Set realistic yield goals.
- Develop and use a comprehensive record-keeping system for field-specific information.
- Adjust nitrogen rate according to soil organic matter content, previous crop and manure applications.
- Use a soil nitrate test where appropriate.
- Use prudent manure management to optimize nitrogen credit.
  - –Test manure for nutrient content.
  - –Calibrate manure application equipment.
  - –Apply manure uniformly throughout a field.
  - –Injection of manure is preferable, especially on strongly sloping soils.
  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

Figure 1
Thirty-county area of east-central and central Minnesota for specific BMPs for nitrogen.

BMPs for East-Central and Central Minnesota

East-central and central Minnesota are characterized by coarse- to medium-textured soils. Most soils in the region were formed in glacial till, with some outwash plains also common. Most east-central and central Minnesota soils are moderately to excessively drained. While most soils in this region are susceptible to leaching, relative differences must be assessed based on soil texture, rainfall, and subsoil.

Average annual precipitation in the region is 25 to 30 inches. Crops are dominated by corn and forages. Specific BMPs for these regions, which include the counties of Cook, Lake, St. Louis, Carlton, Aitkin, Itasca, Isanti, Koochiching, Lake of the Woods, Cass, Beltrami, Hubbard, Wadena, Crow Wing, Morrison, Benton, Stearns, Todd, Mille Lacs, Becker, Otter Tail, Kanabec, Pine, Chisago, Anoka, Sherburne, Ramsey, Hennepin, Wright, and Washington **(Figure 1)**, have been based on field research in Minnesota as well as field research conducted on similar soils in the Midwest.

Nitrogen BMPs for east-central and central Minnesota include:

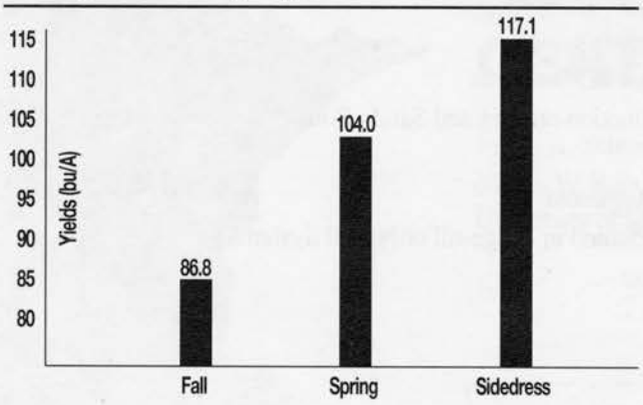
- **Carefully manage nitrogen applications on soils characterized by a high leaching potential.**

1. **Do not apply fertilizer nitrogen in the fall to coarse-textured (sandy) soils.**

Coarse-textured soils are present in counties throughout east-central and central Minnesota. (For irrigated coarse-textured soils, refer to the bulletin *Best Management Practices for Nitrogen Use on Irrigated and Coarse-Textured Soils* AG-FO-6131.) It is extremely important to practice high-level management of nitrogen on these soils for environmental and agronomic reasons. Fall-applied nitrogen, because of the delay between application and crop need, has a greater risk of nitrifying and leaching out of the rooting zone.

Figure 2 illustrates the differential yield response that time of nitrogen application produced when 78 pounds of nitrogen per acre (lb N/A), as urea, was applied to non-irrigated, coarse-textured soil.

Figure 2
Three-year corn grain average yields as affected by fall, spring, and early summer nitrogen applications [1/]



[1/] Schmitt and Beck, 1991

2. **When soils have a high leaching potential, application of nitrogen in a sidedress or split application program is preferred. Use a nitrification inhibitor with early sidedressed nitrogen on labeled crops.**

Data obtained in a three-year study on a coarse-textured, irrigated soil at Becker indicate a clear advantage for sidedress and split applications of nitrogen compared to a single preplant application **(Table 1).** Under these conditions, corn yields were increased by adding a nitrification inhibitor (nitrapyrin) to the sidedress and split applications of nitrogen at rates up through 150 lb N/A.

■ **Spring preplant application of anhydrous ammonia or urea is encouraged. Broadcast urea should be incorporated within three days of application.**

With soils that do not have a high leaching potential, using preplant nitrogen fertilizer in the ammonium-N form

Table 1
Three-year average corn grain yields as influenced by time of application and N-Serve at Becker, Minn./[1]

Nitrogen Treatment Application Time	Inhibitor	Rate (lb N/A) 0	75	150	225
		Yields (bu/A)			
Preplant	None	82	124	147	158
Preplant	N-Serve		132	167	180
8-Leaf	None		147	179	193
8-Leaf	N-Serve		158	186	191
2/3 PP+1/3 12-L	None		132	159	191
2/3 PP+1/3 12-L	N-Serve		144	180	191

1/ Malzer et al., 1981-83

instead of nitrate-N (mobile) form reduces the immediate potential for nitrogen leaching loss. Under normal spring conditions, anhydrous ammonia and urea will take from two to six weeks to nitrify from the ammonium form to nitrate. This delay decreases the potential for leaching of nitrate during the last part of April and in May, when precipitation is highest and crop demand for nitrogen and water is very low.

Urea broadcast on the surface should be mixed into the soil (incorporated) soon after application to reduce potential loss by volatilization and surface runoff. Volatilization is generally accelerated by crop residue and high soil pH. Although high soil pH is uncommon in east-central and central Minnesota, high amounts of surface residue are more common because of conservation tillage being used with continuous corn. In addition, urea left on the soil surface can easily be washed toward streams and lakes during intense rains.

■ **Inject or incorporate sidedress applications of urea and UAN to a minimum depth of 4 inches.**

Incorporation of urea and urea-containing fertilizers reduces the potential for loss by volatilization. In addition, materials injected or incorporated to a 4-inch depth are more likely to reach roots under dry conditions. Surface-applied materials are less likely to reach roots under dry conditions, and yields may suffer.

Nitrogen not absorbed by plants often remains in the soil after harvest and thus is highly susceptible to leaching loss before the next year's crop can use it.

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BEST MANAGEMENT PRACTICES FOR NITROGEN USE IN NORTHWESTERN MINNESOTA

by M. A. Schmitt and J. A. Lamb, Extension Specialists, Department of Soil Science, and G. W. Randall, Soil Scientist, Southern Experiment Station, University of Minnesota

Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface- and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

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  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

Figure 1
Eleven-county area of northwestern Minnesota for specific BMPs for nitrogen.

BMPs for Northwestern Minnesota

Northwestern Minnesota is characterized by fine-textured soils formed in old lake bed deposits, which means most of the soils in the region have poor to somewhat poor internal drainage. Surface drainage is used to improve crop production. Average annual precipitation is less than 24 inches. Cropping systems are dominated by small grain, soybean, sugar beet, sunflower, and potato. Specific BMPs for the counties in this region (Kittson, Roseau, Marshall, Pennington, Red Lake, Polk, Norman, Mahnomen, Clay, Clearwater, Wilkin; see **Figure 1**) have been based on field research conducted at the Northwest Experiment Station as well as other locations throughout the state.

The nitrogen BMPs for northwestern Minnesota include:

- **Use a soil nitrate test from either a 2- or 4-foot depth sample to determine nitrogen needs. Soil samples should be taken in early spring (preferably) or in the fall as an alternative, after the soil temperature is below 50° F at the 6-inch depth.**

The soil nitrate test is an excellent nitrogen management tool for crop producers in western Minnesota and has been recommended for a number of years. A 2-foot depth is recommended for small grain, potato, and sunflower while

a 4-foot sample is preferred for sugar beets. When this test is used, nitrogen fertilizer recommendations are based on the amount of residual or carryover nitrate-N (NO_3-N) in the soil profile and are adjusted for previous crop and yield goals.

One benefit of a soil nitrate test is to identify those sites/fields that will not respond to additional fertilizer nitrogen because of high residual nitrates. Reasons for high nitrate carryover are:

- excess previous nitrogen applications;
- unused nitrogen due to poor crop growth; and/or
- a previous history of high rates of manure.

Identifying these sites and reducing additional nitrogen input will return a direct economic savings to the farmer and reduce the probability of high nitrate losses to the environment.

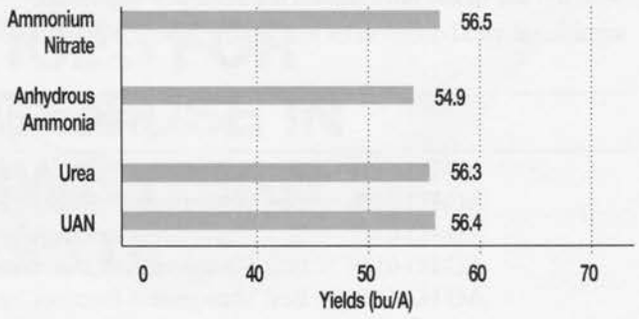
Benefits from using the soil nitrate test can be illustrated by comparing fertilizer nitrogen recommendations for wheat with and without the test. Nitrogen calibration data from 1989 (following 1988 drought) indicated the optimum fertilizer nitrogen rate to be 40 pounds of nitrogen per acre (lb N/A) for wheat yields averaging 60 bu/A. Without the test, the fertilizer nitrogen recommendation would have been 130 lb N/A. With the test results (0-2 ft., 95 lb N/A) included in the recommendation formula, a fertilizer nitrogen rate of approximately 50 lb N/A was recommended. In this example, use of the soil nitrate test reduced the fertilizer rate by 80 lb N/A and did not affect yield.

■ **In situations where fall nitrogen applications are used, delay application until the soil temperature is below 50° F at 6-inch depth. Use anhydrous ammonia or urea nitrogen sources; UAN should not be fall-applied. Broadcast urea and spring preplant applications of UAN should be incorporated within three days of application.**

Delaying nitrogen application until soil temperatures cool to 50° F will minimize nitrification, thereby reducing the potential for nitrogen loss. Warmer soil temperatures enhance the conversion to nitrate and thus increase the potential for nitrogen losses. When averaged over numerous years, application of ammonium-N sources (anhydrous ammonia and urea) will result in less nitrogen loss (and higher yields at same nitrogen rate), especially when applied on cooler soils rather than warmer soils. Long-term temperature data from Crookston indicates that September 28 is when the 6-inch soil temperature reaches 50° F. On average, the temperature fluctuation stays below 50° F on October 9.

Anhydrous ammonia and urea are the recommended nitrogen fertilizer sources for fall applications. These nitrogen sources consist completely of ammonium-N, so the nitrogen is not subject to denitrification or leaching losses until nitrification occurs. UAN is formulated with some of its nitrogen in the nitrate-N form, which is immediately subject to these nitrogen loss mechanisms. Potential fall, winter, and early spring nitrogen losses can be eliminated if UAN is used only for spring or topdress/sidedress applications. A nitrogen source study at Crookston concluded that all nitrogen sources evaluated performed equally when the nitrogen was spring-applied **(Figure 2).**

Figure 2
Wheat yields as affected by 100 lb N/A supplied by different nitrogen sources.[1/] (The soil nitrate test, 0-2 ft, was 40 and 45 lb N/A in 1982 and 1983, respectively.)

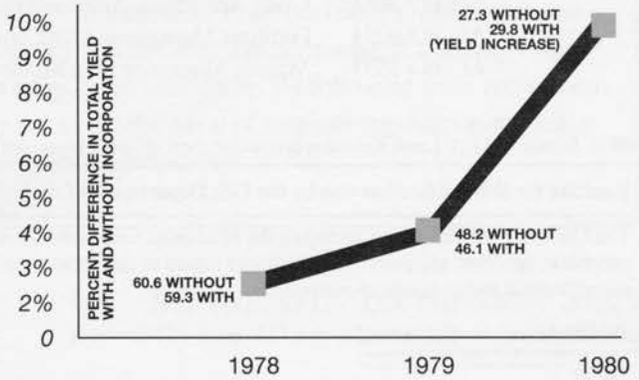


[1]Varvel and Severson, 1982-83

Incorporating broadcast urea and preplant applications of UAN within three days is recommended to reduce nitrogen loss into the atmosphere due to volatilization. Volatilization is generally enhanced by high soil pH, presence of crop residues, and warm temperatures.

Research results from Crookston illustrate that, while there was no statistical difference for two of the three years reported, conditions were such in 1980 (hot, dry spring) that incorporating the urea was beneficial **(Figure 3)**.

Figure 3
Average wheat yields when 80 lb N/A was spring-applied with and without incorporation.[1/]



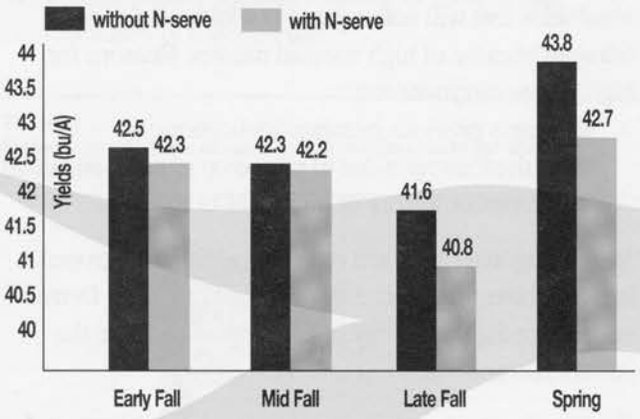
[1/] Varvel and Meredith, 1978-80

■ **Nitrification inhibitors are not recommended on fine-textured soils but are recommended on coarse-textured soils with high leaching potential.**

Nitrification inhibitors are generally not recommended for use in northwestern Minnesota because the fine-textured soils and lower rainfall amounts reduce the potential for either leaching and/or denitrification. However, there are some beach ridge soils that are coarse-textured where special nitrogen management systems—which may include nitrification inhibitors—should be considered.

Nitrification inhibitors have been evaluated with anhydrous ammonia applied on fine-textured soils on several dates at the Northwest Experiment Station at Crookston **(Figure 4)**. Yields from all of the treatments were significantly greater than the control plots (where no anhydrous ammonia was applied), yet there was no yield advantage with the use of the nitrification inhibitor nor were there significant yield differences among the dates of application. (Individual years have shown similar results.) Thus, nitrification inhibitors are not recommended for the majority of soils in northwestern Minnesota.

Figure 4
Average wheat yields as influenced by date of fertilizer nitrogen application and a nitrification inhibitor.[1/]



[1/] Malzer et al. 1977-79

Related Publications

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AG-FO-6131	Best Management Practices for Nitrogen Use on Irrigated, Coarse-Textured Soils
AG-FO-5880	Fertilizing Cropland With Dairy Manure
AG-FO-5879	Fertilizing Cropland With Swine Manure
AG-FO-5881	Fertilizing Cropland With Poultry Manure
AG-FO-5882	Fertilizing Cropland With Beef Manure
AG-FO-5883	Self-assessment Worksheets for Manure Management Plans
AG-FO-3790	Fertilizing Corn in Minnesota
AG-FO-3813	Fertilizing Soybeans in Minnesota
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AG-FO-3774	Nitrification Inhibitors and Use in Minnesota
AG-FO-3769	Providing Proper N Credit for Legumes
AG-FO-2274	Using the Soil Nitrate Test for Corn in Minnesota
AG-FO-2392	Managing Nitrogen for Corn Production on Irrigated Sandy Soils
AG-FO-0636	Fertilizer Urea
AG-FO-3073	Using Anhydrous Ammonia in Minnesota
AG-FO-6074	Fertilizer Management for Corn Planted in Ridge-till or No-till Systems
AG-FO-3553	Manure Management in Minnesota

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CLEAN WATER

You Can Make A Difference

AG-FO-6131-B
1993

BEST MANAGEMENT PRACTICES FOR NITROGEN USE ON IRRIGATED, COARSE-TEXTURED SOILS

by M. A. Schmitt, Extension Specialist; Dept. of Soil Science; G.W. Randall, Soil Scientist, Southern Experiment Station; and G. L. Malzer, Soil Scientist, Dept. of Soil Science; University of Minnesota

Summary

Nitrogen (N) is an essential plant nutrient that contributes greatly to the agricultural economy of Minnesota crop producers. Unfortunately, the nitrate form of nitrogen can leach into surface- and groundwaters if nitrogen management is not practiced carefully. The public will not tolerate contamination of water resources by agricultural production systems; laws regulating use of nitrogen fertilizers could be adopted if contamination from agricultural activities is not minimized.

The research-based Best Management Practices (BMPs) outlined in this bulletin are economically and environmentally sound. It is strongly suggested that farmers adopt them voluntarily. By following these recommendations, agriculture can avoid the threat of fertilizer regulations and enjoy a more profitable and better community.

These nitrogen BMPs were assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by the MDA.

MINNESOTA EXTENSION SERVICE

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Introduction

Nitrogen (N) is an essential plant nutrient that is applied to Minnesota crops in greater quantity than any other fertilizer. In addition, vast quantities of nitrogen are contained in the ecosystem, including in soil organic matter. Biological processes that convert nitrogen to its mobile form, nitrate (NO_3), occur continuously in the soil system. (For greater detail see *Understanding Nitrogen in Soils* AG-FO-3770.) Unfortunately, nitrates can be leached from the rooting part of the soil. To minimize losses to surface- and groundwater, management guidelines have been developed.

Best Management Practices (BMPs) for nitrogen are broadly defined as "economically sound, voluntary practices that are capable of minimizing nutrient contamination of surface- and groundwater." The BMPs recommended here are based upon research, particularly at the University of Minnesota and other land-grant universities, and upon practical considerations.

The BMPs are based, in part, upon the concept of total nitrogen management, which accounts for all forms of on-farm nitrogen in the development of crop management plans. BMPs were developed for statewide, regional, and special situation conditions. The special-situation BMPs developed for the unique soil, climatic, and management conditions associated with irrigated agriculture throughout the state refine the prescriptions of the statewide and regional BMPs.

Statewide Nitrogen BMPs

Statewide BMPs are applicable to all crops and farming practices. They are based upon the concept that accurate determination of crop nitrogen needs is essential for profitable and environmentally sound nitrogen management decisions. The statewide BMPs shown below are described in greater detail in *Best Management Practices for Nitrogen Use Statewide in Minnesota* AG-FO-6125.

- Set realistic yield goals.
- Develop and use a comprehensive record-keeping system for field-specific information.
- Adjust nitrogen rate according to soil organic matter content, previous crop, and manure applications.
- Use a soil nitrate test where appropriate.
- Use prudent manure management to optimize nitrogen credit.
  - –Test manure for nutrient content.
  - –Calibrate manure application equipment.
  - –Apply manure uniformly throughout a field.
  - –Injection of manure is preferable, especially on strongly sloping soils.
  - –Avoid manure application to sloping, frozen soils.
  - –Incorporate broadcast applications whenever possible.
- Credit second-year nitrogen contributions from alfalfa and manure.
- Do not apply nitrogen above recommended rates.
- Plan nitrogen application timing to achieve high efficiency of nitrogen use.

BMPs for Irrigated Soils

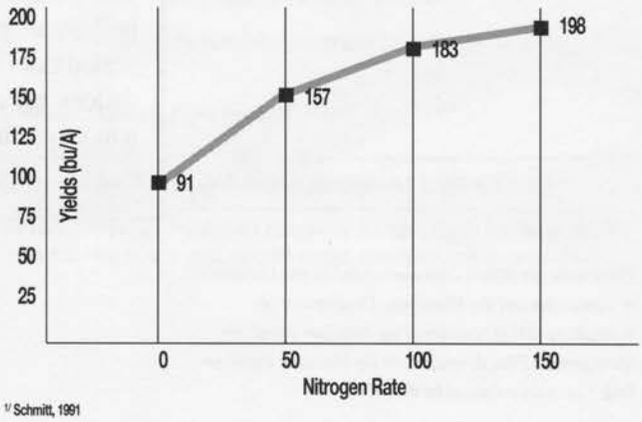
Irrigation, especially on coarse-textured (sandy) soils and with shallow-rooted crops, increases the chances that applied nitrogen will leach (wash away) before it can be absorbed. Irrigated soils in Minnesota were typically formed in outwash plains or alluvium and are, consequently, of coarse texture. Sandy loams typically contain one-third to one-half of the available water that the silt loam soils contain. Thus, irrigation scheduling on these soils, with their low capacity for holding water, is critical because of the potential that excess water could be applied to the soil and leach mobile nutrients such as nitrate. Areas of irrigation occur throughout the state, with the volume of water use varying depending on soil and geologic conditions and average annual precipitation. Commonly, irrigated crops include field corn, potatoes, and sweet corn.

The nitrogen BMPs for irrigated soils in Minnesota include:

- **Do not fall-apply fertilizer nitrogen to soils in the textural classes of sandy loam, loamy sand, and sand.**

Fall applications create a great risk of nitrogen loss from leaching, primarily because of the length of time between application and subsequent plant use. During the late fall, winter, and spring months, nitrate-N (NO_3-N) can leach downward. This happens no matter what fertilizer product was used, and the use of nitrification inhibitors does not minimize this risk appreciably. **Figure 1** depicts a typical nitrogen response on an irrigated, coarse-textured soil, reemphasizing the dramatic effect less-than-optimum nitrogen rates can have on grain yields.

Figure 1
Corn grain yields for several nitrogen rates averaged for several methods of application on a Dakota County irrigated soil in 1990.[1/]



[1/] Schmitt, 1991

■ **Follow proven water-management strategies to provide effective irrigation and minimize leaching.**

This is probably the most important practice irrigators can follow to control nitrogen losses. Sound irrigation management requires a careful balance between water inputs (rainfall and irrigation) and water outputs (crop use and evaporation) to minimize leaching losses. Thus, the nitrogen fertilizer management program and the water management program need to be combined for an effective crop management program. More details regarding nitrogen management in the context of water management strategies are given in *Managing Nitrogen for Corn Production on Irrigated Sandy Soils* AG-FO-2932.

■ **Test irrigation water for nitrogen content and adjust nitrogen fertilizer rates accordingly.**

Fertilizer nitrogen rates are based on what the crop will need and the appropriate amounts of nitrogen credits from other sources. Those sources include soil organic matter, previous legume crops, manures, and possible residual nitrogen from the previous year. An additional source of nitrogen, commonly overlooked, comes from irrigation water. All of these nitrogen credits should be subtracted from what the crop needs —resulting in lower and more appropriate fertilizer nitrogen rates.

Relatively small concentrations of NO_3-N in irrigation water can add up because of the volumes of water applied. For example, if an irrigator applies an acre-inch of water on six dates in June and July, and the water has 18 parts per million (ppm) NO_3-N, how much nitrogen is being applied? A simple calculation is to divide the NO_3-N concentration by 4.4, and this value will be the pounds of nitrogen applied per acre-inch of water. In this example, 18 ppm divided by 4.4 equals 4.1 lb per acre-inch, multiplied by 6 acre-inches, equaling 24.6 pounds of nitrogen per acre (lb N/A) to credit. Nitrogen credit should not be taken from nitrogen in water applied after corn silking.

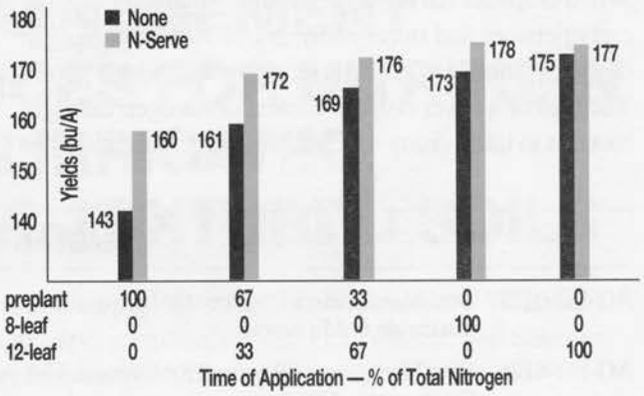
■ **Use sidedress or split applications of nitrogen on irrigated soils. Do not rely on fertigation to deliver more than one-third of the required nitrogen.**

On irrigated soils, the goal of a nitrogen management program is to apply it as close as is practically possible to when the crop takes up nitrogen. Remember that the risk of nitrogen leaching loss is high in irrigated soils, especially when nitrogen is applied before the plant can use it. Split applications are more likely to place nitrogen in the soil when the plant needs it.

Figure 2 illustrates this concept. Average yields were significantly lower when all of the nitrogen was applied before planting. Yields improved as an increasing percentage of nitrogen was applied at the later dates. Highest yields in this study were measured when all the nitrogen (starter nitrogen was used) was applied at the 8- to 12-leaf stages of corn, which is the stage when the maximum nitrogen-uptake period begins.

Split applications also avoid some of the other risks associated with a single application. Extremely wet weather and/or mechanical breakdown of application equipment could be disastrous if one relied on applying all the nitrogen as a late sidedressing. Wet weather can also be a problem if one was planning to apply significant amounts of nitrogen with fertigation. Not only is the irrigation unnecessary, but the excess water in the easily saturated soils will allow even more rapid leaching of nitrogen.

Figure 2
Three-year average irrigated corn grain yields as affected by time of application and a nitrification inhibitor.[1/] Yields are averages of 75, 150, and 225 lb N/A rate treatments.



[1/] Malzer et al., 1981-83

■ **Use a nitrification inhibitor on labeled crops when the majority of the nitrogen is applied in a single preplant or early sidedress application. For corn, nitrogen treated with a nitrification inhibitor should be applied before the plant is 12 inches tall.**

A nitrification inhibitor (NI) can be part of a recommended nitrogen management program on irrigated soils. With preplant and early sidedress applications, nitrogen rates applied with a NI are better than similar rates without a NI (Figure 2). Note, however, the yield response to NIs diminishes with later application times. A NI allows for more management options on irrigated soils.

While NIs are most commonly associated with anhydrous ammonia and sometimes urea, they can be used with solution UAN. Because the NI only delays conversion of ammonium to nitrate, it will have no effect on the 25 percent of the nitrogen that is nitrate in UAN. Use of a NI with UAN should still only be considered when early sidedress applications are necessary.

■ **Include a small amount of nitrogen in starter fertilizer in most situations (10-20 lb N/A).**

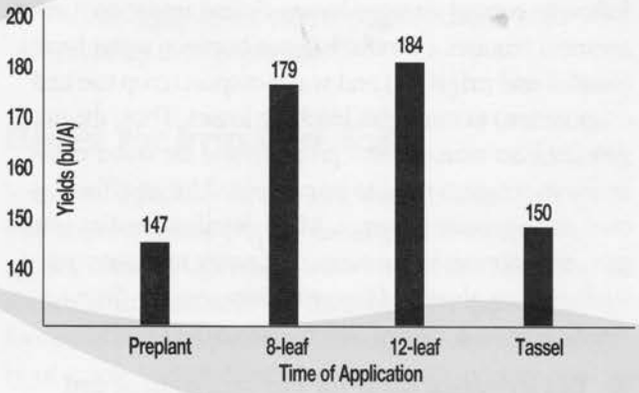
For most irrigated crops, the primary nitrogen uptake period does not occur until several weeks after planting. How-

ever, some nitrogen is needed for early season growth and establishment. Including 10 to 20 lb N/A in a starter fertilizer can provide sufficient nitrogen for early plant growth.

■ **Do not delay nitrogen applications past optimum uptake period.**

Nitrogen applied after the target crop's active nitrogen uptake period is unlikely to be used efficiently by the crop. Significant portions of such late-applied nitrogen will be lost to leaching, and lower yields will result due to limited nitrogen uptake. With corn, waiting until tasseling results in yields similar to when all of the nitrogen had been applied preplant (**Figure 3**). Optimum uptake periods vary depending on the crop and sometimes with specific crop varieties (e.g. short- versus long-season maturities).

Figure 3
Three-year average irrigated corn grain yields as affected by time of nitrogen application.[1/] Nitrogen applied as urea at 150 lb N/A.



[1/] Malzer et al. 1981-83

■ **Establish a cover crop following early harvests.**

When crops are harvested in late July and August (e.g., early potatoes and sweet corn), any NO_3-N remaining in the soil is subject to nitrogen leaching with added rainfall. The goal of a cover crop, in context of nitrogen management, is to take up any residual nitrogen to minimize this loss potential. A cover crop also curbs wind erosion. After the cover crop is killed, the nitrogen will be released from the vegetation the following spring/early summer. The success of cover crop establishment and growth is related to the length of time available between harvest and freeze-up.

Related Publications

AG-FO-6125	Best Management Practices for Nitrogen Use Statewide in Minnesota
AG-FO-6126	Best Management Practices for Nitrogen Use in Southeastern Minnesota
AG-FO-6127	Best Management Practices for Nitrogen Use in South-Central Minnesota
AG-FO-6128	Best Management Practices for Nitrogen Use in Southwestern and West-Central Minnesota
AG-FO-6129	Best Management Practices for Nitrogen Use in East-Central and Central Minnesota
AG-FO-6130	Best Management Practices for Nitrogen Use in Northwestern Minnesota
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Working Group On Water Quality

U.S. Department of Agriculture

Waterfax 156

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Minnesota

Anoka Sand Plain Demonstration Project

(Anoka, Benton, Chisago, Hennepin, Isanti, Mille Lacs, Ramsey, Sherburne, Stearns, Washington, Wright Counties)

The Anoka Sand Plain area extends through portions of eleven counties in east-central Minnesota. It covers approximately 1700 square miles and encompasses a great diversity of agricultural crop production. It stretches some 100 miles (E-W) from the St. Croix River to St. Cloud and nearly 80 miles (N-S) bordered on the south by the Minneapolis-St. Paul urban development. The northern border is close to the climatic northern limit of the Midwest corn belt.

The aquifer is hydro-geologically vulnerable, due to the coarse texture soils overlying the sand and gravel aquifer materials, and the shallow depth of groundwater. This vulnerability is important, since the aquifer recharges the twin cities' water supply, and provides base flow to both local streams and to the Mississippi River.

Annual water loss to streamflow is about 4.5 inches, mostly due to groundwater flow into streams. The annual recharge to the aquifer is estimated to be 8 inches. An estimated 15 to 20 percent of irrigation water returns to the aquifer.

A study by the U.S. Geological Survey on the impact of agriculture on water quality in sand plain aquifers sampled 56 wells to characterize differences in nitrate - nitrogen for three major land uses. Mean NO_3-N concentrations were 4.3 mg/l for natural areas; 5.4 mg/l for non-irrigated cropland; and 17 mg/l for irrigated cropland. For a reference level, 10 mg/l is the EPA's Maximum Contaminant Level for drinking water.

There are some 330,000 acres of field crops in the area: One-third of the acreage produces corn; one-third is in hay crops; and one-third produces soybeans, corn silage, oats, potatoes, sweet corn and small grains. There are some 100,000 cattle and calves, 100,000 hogs and a million chickens in the area. Livestock wastes are often land-applied, as a disposal method.

The use of agricultural chemicals is widespread, especially on crops such as sweet corn and potatoes.

This is one of a series of descriptions of U.S. Department of Agriculture water quality projects that were established in 1990 and 1991. They include non-point source hydrologic unit area projects, demonstration projects, and Mid-west management system evaluation area projects.

In normal years, rainfall is inadequate for high value crops on these sandy soils. Irrigation, the widespread use of agricultural chemicals, the land disposal of animal manures and the coarse texture and drouthy nature of the soils cause concerns about water quality.

PROJECT GOAL

To encourage farmers on the Anoka Sand Plain to adopt best management practices, developed

through research, that will reduce the potential for groundwater contamination while maintaining farm profitability.

Project Objectives and Impacts

To assist producers in adopting nitrogen management practices that will reduce the amount of fertilizer nitrogen used in crop production without lowering farm profitability.

In 1991, 30 producers reduced nitrogen use on 3,972 acres by an average of 43.3 lbs. per acre, for a reduction of 170 thousand lbs. (85 tons)

In 1992, 70 producers reduced nitrogen use on 8,776 acres by an average of 25.1 lbs. per acre, for a reduction of 220 thousand pounds (110 tons).

To increase farmer use of more efficient irrigation management practices

Twenty farmers implemented irrigation scheduling on 3,200 acres in 1991. This increased to 21 farmers and 3,700 acres in 1992.

Irrigation scheduling is a science based program to help farmers to determine when to irrigate, and how much water to apply. Its use greatly reduces the likelihood of leaching nitrates or pesticides below the root zone or into the groundwater.

To develop and test an integrated Best Management Practice (BMP) approach to select pest control practices, including pesticide use based on need, economic benefit and water quality concerns.

In 1991, crop pest scouting was conducted on 4,054 acres for 28 farmers; yield checks were done on 28 fields; tissue tests were performed on 99 samples for 22 farms; manure tests were done on 40 samples from 15 farms; seven producers switched from unlabelled herbicides to proper ones or to mechanical control strategies. Twenty (20) producers changed pesticides to reduce the threat of leaching into the groundwater.

In 1992, crop pest scouting was done on 3,245 acres on 40 farms; pest management plans were implemented on 8,892 acres on 73 farms; tissue tests were done on 88 samples from 27 farms; manure tests were done on 66 samples from 29 farms; nutrient management plans were developed for 70 farms and 8,726 acres; soil testing was done for 3,620 acres; atrazine applications were reduced on 102 fields, and eliminated on an additional 42 fields.

In 1992, pesticide use was reduced on 7100 cropland acres, by an aggregate of 3500 lbs (a.i.).

Data are being collected to enhance all of the project objectives. Wells are being tested for NO_3-N; real-time weather data are being incorporated into irrigation scheduling programs; and soil-water samples are being analyzed to demonstrate the immediate effects of reduced nitrogen fertilization.

The project is working with the Northern Cornbelt Management System Evaluation Area (MSEA) on conducting educational programs for residents of the Anoka Sand Plain. In September 1992, 40 local decision-makers from five counties participated in a special day-long water quality tour on "Groundwater Issues in East-Central Minnesota" that featured field stops at both the Princeton research site and a project demonstration farm in Isanti County.

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ASCS: Greg Anderson (612) 290-3659

Board member Update

Minnesota Board of Water & Soil Resources

April 1993

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.

Northern Region

When the northern staff wasn't out looking for new office space at the Department of Natural Resources (DNR), the Pollution Control Agency (PCA), or the Minnesota Department of Agriculture (MDA), they were busy doing real work to promote the goals of BWSR and local governments. A few examples:

- Bemidji Board Conservationist (BC) Dale Krystosek met with his eight water planning counties in Wadena on March 3, 1993. Many exciting water planning implementation projects are now happening as a result of BWSR base and challenge grant monies to counties. Dale also met with Grant SWCD regarding the Niemachl Lakes Project, a multi-county effort to restore, enhance, and protect wetlands in a 35,000 acre watershed. Dale also gave a presentation at the Rural Non-Point Conference held in La-Crosse, Wisconsin.

- Bemidji BC Brian Dwight has been busy on the committee to retool the Reinvest in Minnesota (RIM) Reserve program. Brian and Bemidji BC Keith Grow both agree that steady progress is being made and that a more "user friendly" RIM program will result from the committee's work. Brian has also been busy putting together a technical training session for soil and water conservation districts (SWCDs), Extension, and Soil Conservation Service (SCS) folks on waste utilization. Brian reports that the Wetland Conservation Act (WCA) is alive and well in the northwest. He's been involved with the Grygla Airport project and a private project for "Shotgun Red," a Nashville T.V. star. Some people will do anything to make a name for themselves.

- Brainerd BC Dan Steward finally saw his (and Keith's) work with the Snake River group approach a conclusion. Eleventh hour discussions with the Mille Lacs county attorney led to a seventh draft of the joint powers agreement that staff believe addresses the 13 criteria previously identified. Dan also worked with four SWCDs to apply for special project or Streambank, Lakeshore and Roadside funds.

- Keith Grow continues to cement his ongoing relationship with legislators and attorneys in the Stearns County area. It seems to be more of a rule than a coincidence that legislators, attorneys, contractors (basically everyone) contest many of the WCA projects in Stearns County. Keith, of course, gets dragged into the middle of all this. Keith and I agree that BWSR needs to continue to support the concept that LGU decisions are final in all but extenuating circumstances. Keith has been asked to help Sherburne and Benton counties formulate a joint powers agreement. This action is the result of local lake association pressure. Keith performed a cost-share audit in Wright County and uncovered program violations. The District plans to appeal, so stay tuned.

- Water Resources Education Coordinator Barbara Liukkonen (Duluth) worked with Communications Director Susan Tsakakis and Extension staff person Catherine Huebner to conduct three workshops on "Exploring Ethical Leadership" in Bemidji, St. Cloud, and New Ulm. The sessions were well attended and received good reviews. Barbara presented the Shoreland BMPs fact sheet series to the St. Louis County Health Department field inspectors. Barbara and County Extension also held a media "event" to introduce the BMP series to Arrowhead residents.

- Duluth Shoreline Engineer Jack Salmela reports that he gave a presentation to the Two Harbors City Council. They voted

to apply for cost-share on four different shoreland projects.

- Duluth BC Mark Nelson held a New Supervisor/Employee Orientation on March 29 in Duluth. Mark also reports that the Erosion Control Conference held on March 5, 1993, in Brooklyn Center, attracted 220 people. BWSR was instrumental in planning this conference.

- Forester Jim Lemmerman attended the annual meeting of the Department of Natural Resources Private Forest Management Personnel. This was a good opportunity for Jim to interact with DNR foresters. Jim did a presentation on SWCD tree programs. He says they were surprised at the size and sales volume of the district programs. Jim is also working with the SCS forester to coordinate a windbreak technology training in Marshall, July 1993.

- Dan Steward and Northern Supervisor Ron Shelito were invited to participate in a bilateral Russian/American environmental summit April 3-8, 1993, at Craguns. Eighteen Russians, including top level government officials and scientists, made the trip. The Russians want to implement environmental clean-up and ongoing environmental management programs. The summit was organized by A.W. Research Labs of Brainerd for the purpose of discussing American environmental programs and transfer of American technologies to Russia. Dan and Ron participated in a group consisting of two Russians, DNR, PCA and local watershed district representatives. Their charge was to set up an ongoing model government structure to manage water in a selected watershed. The Russians seemed very impressed and appreciative of the assistance offered.

Southern Region

- The month of March brought about several types of activities for the BWSR staff in southern Minnesota. Board conservationists were busy reviewing, commenting on and approving SWCD annual plans of work and annual reports. Also, their review of RIM and Permanent Wetland Preserves (PWP) agreement packages increased greatly, especially in the south central region, which continues to lead the way in RIM/PWP acceptance by landowners.

- Eight of the southern BWSR staff attended the Non-Point Source (NPS) Pollution Conference held March 17-19, 1993, in LaCrosse, Wisconsin. Presenters from Wisconsin, Iowa and Minnesota provided many different perspectives with regard to NPS problems. In addition to various agency staff, several presenters were landusers/farmers. To many of those attending this conference, the landuser presentations were the highlight of the session, giving an actual hands-on perspective. Hopefully landuser presentations will continue to be a part of these types of conferences so that agencies hear directly from the landuser.

- Three orientation sessions for new SWCD supervisors and employees were conducted in Rochester, Marshall and New Ulm. Twenty-three supervisors and six recently employed staff members attended. BWSR staff hosted these sessions, with additional presentations made by the Minnesota Association of Soil and Water Conservation Districts, the Soil Conservation Service and the Minnesota Association of Conservation District Employees (MACDE).

- The Marshall board conservationists sponsored a one-day session on watershed district overall management plan updates. With about half of the watershed districts in this state operating without an updated plan, they felt it necessary to make an effort to get all of their districts thinking about updating their plans. Doug Thomas was the session speaker. The BCs are very confident that the districts in their area that need to update their plans will start the process in the near future.

- The southwest region water plan coordinators sponsored a one-day Water Plan Implementation Workshop for members of their county local water plan task forces. About seventy-five task force members attended this workshop. Round table discussions were used to facilitate idea-sharing between counties with topics such as feedlot issues, on-site sewage treatment, water testing, task force roles and EPPL 7.

- The Brown-Nicollet-Cottonwood Clean Water Partnership Project offered a workshop for elected officials from within the three counties. This workshop, held in New Ulm on March 1, 1993, gave a brief summary of past project activities and future workplan items for 1993-1994. Elected officials at-

tending included county commissioners, SWCD supervisors and township officials. This year's project goals are to establish acceptance of nitrogen best management practices (BMPs) and other water quality BMPs through education and demonstration.

- Brown SWCD is developing Permanent Wetland Preserve easements at a pace which will soon place 282 acres of wetland into perpetual easement.

- Feedlots were the subject of a very informative March 25 meeting of nine DNR conservation officers (COs) and the local water plan coordinators of south central Minnesota. The COs plan to discuss the history of individual cases with county officials as they enforce water quality laws jointly with the PCA. Enforcement action and information meetings continue to take place throughout the area because PCA and DNR officials are stepping up their efforts to investigate blatant cases of manure pollution.

- Dave Peterson, board conservationist in Rochester, worked on Water Bank conversions to PWP easements on approximately 270 acres. Dave also serves on the RIM program subcommittee which continues to deal with the application process, emphasizing on decentralization of this process.

- The new Rochester BC, Pete Waller, began working on February 24th. Pete was previously employed by the Pelican River Watershed District and the Upper Minnesota River Watershed District. He is busy developing a working relationship with staff and board members of the local government units; learning the BWSR's services and programs; and becoming familiar with the resources of southeast Minnesota.

- The Cannon River Watershed Partnership (CRWP) is completing its work on the Legislative Commission on Minnesota Resources (LCMR) grant provided through the BWSR and is now increasing its activities in the watershed as it adds staff and takes on new initiatives. CRWP served as the Minnesota host for the "Watershed '93" national conference in Washington, D.C., through an inter-active satellite downlink.

Land & Water Section

- Considerable time has been spent on the Snake River Joint Powers Agreement as an alternative to establishment of a watershed district. Staff expects to continue to work closely with the counties and the lake associations on the development of the first workplan and budget.

- Hydrogeologist Eric Mohring, along with BC Bill Best of the Bemidji office, were part of a set of groundwater meetings held in Marshall County in northwestern Minnesota. Over 200 local area residents attended the informational meetings.

- Planner Dave Behm has been active with the continuing revision to the RIM/PWP handbook. Dave has also represented the BWSR at recent Agricultural Environment Forum meetings.

- Doug Thomas, along with Susan Tsakakis, is working with the Association of Watershed Districts on a manager handbook.

- Bryan Alpaugh, computer specialist, has rewritten the BWSR RIM database and has completed an EPPL7 training course. Many of the colored status maps are a result of Bryan's recent efforts.

- Eric Mohring assisted the Okabena-Ocheda Watershed District and Nobles County on an investigation regarding the potential for groundwater contamination from a proposed feedlot just across the border into Iowa. The feedlot is located in the vicinity of the city of Worthington's municipal well field.

Metro Region

This past month has been quite busy as usual for Metro Region staff. The work effort has centered around continued implementation of the WCA, 509 plan review and dispute resolution.

- During the first three weeks of April staff were out in the field on 16 separate technical evaluation panels (TEPs) for WCA. Five involved plats containing approximately 13, 23, 40, 45 and 60 lots. The other 11 TEPs involved projects on 11 separate land parcels. Enforcement of the WCA has been successful to varying degrees. For example, during March and April, two Anoka county DNR Conservation Officers issued a total of nine cease

and desist orders. No CDOs have yet resulted in a summons and complaint.

- With respect to 509 plan review (metro watershed management organization plan review), meetings have been held with the Lower Minnesota River Watershed District (WD) and Minnehaha Creek WD to discuss final revisions to their plans. Minnehaha Creek WD has requested that the BWSR approve its plan at the May board meeting. Staff has also recently contacted the LGUs containing areas that were formerly exempt from 509 planning, and consequently, there has been good progress made towards consolidation of these areas with existing WMOs.

- With regard to dispute resolution, staff worked with the Dispute Resolution Committee (DRC) towards resolution of the city of Richfield's petition for boundary change. This item will be a decision item on the board's April meeting agenda. Staff also held a joint meeting with the city of Fridley and Rice Creek WD to discuss the staff report prepared pursuant to Chapter 8410.0180. At the meeting, the Rice Creek WD agreed to schedule a hearing on the Locke Lake project and the City agreed to withdraw its appeal without prejudice upon the WD's scheduling of the hearing.

- Staff members have also been working with WCA staff and the DNR as to how shoreland and WCA grant funds should be best allocated to get the most bang for the buck in terms of the shoreland and wetland management issues facing the Metro Region. In the last decade over 100 percent of the growth in the state's population (299,395) has occurred in the Metro Region. This should be taken into account, along with the large number of LGUs administering the shoreland and WCA programs, in conjunction with the fact that most of this growth has occurred in the developing ring of suburbs. Any thoughts that board members might have on this issue should be forwarded to Bruce Sandstrom.

Engineering and Technical Services Section

RIM/PWP Conservation Easement Programs

- Earlier this calendar year, the conservation easement programs (RIM and PWP) staff began a major retooling of the easement acquisition process and associated program handbook. Four guiding principles were identified by the Conservation Easement Team:
    - develop a more user-friendly process and handbook
    - achieve stability in the easement acquisition process
    - streamline the process
    - strive for a locally-driven program

- Seven subteams, composed of field and central office staff, were established to work on individual pieces of the process and handbook. Team members have worked this effort into their schedules during and after business hours. Substantial momentum was generated in March and April, with commensurate progress. The team held a meeting with Barb Cobb and John Boulton of the RIM Strategic Plan Committee on April 16 to bring them up to date on the progress of this effort. An all-subteams meeting will be held at the end of April to review our collective draft products, including their completeness and compatibility.

- We plan to expand the involvement of MACDE in May, have the new program handbook ready by mid to late summer, provide training to SWCDs in late summer and conduct the next sign-up in late fall. (The most recent sign-up was held in February.) We are confident that this retooling effort will result in substantial improvements in program efficiency.

Feedlots

- The Interagency Feedlot Enforcement Task force, led by the PCA, has developed a list of questions and answers concerning feedlot regulations and the recent emphasis on enforcement. The purpose is to provide a basis for consistent responses from all state and local agencies involved in this issue. At this writing, the PCA is making a few additions to this list. When the latest version is received by BWSR staff, a copy will be sent to all BCs and SWCDs, as well as BWSR Feedlot Advisory Committee members.

- Brad Matlack, BWSR feedlot specialist, has worked with New Ulm BC Chris Hughes to set up an introductory feedlot training session for five counties within the Blue Earth River basin on May 20, 1993. This session will involve BWSR, SCS, PCA and Gopher State One-Call staff members, who will explain the feed-

lot regulations, cost share programs and technical assistance provided by these state and federal organizations. Brad is planning a follow-up classroom and on-site training session regarding the use of the Feedlot Evaluation Model (FLEVAL) in early June.

- BWSR Engineer Al Kean met with Jim Rossman and Ted Lovdahl of the Feedlot Advisory Committee on April 13 to finalize a recommended board resolution regarding cost sharing with feedlot owners where enforcement actions have been taken by the PCA, DNR and/or county attorneys. This recommended resolution will be presented to the full board at the April meeting.

- Brad Matlack and Al Kean also initiated discussions with the Feedlot Advisory Committee on April 13 regarding the need for revising the cost share program rules related to feedlots, and presented some ideas for revisions. We intend to continue to develop these needed rule revisions, which have been identified through Brad's manure management system design and training work.

- Brad continues to coordinate with Extension, SCS, MDA and PCA to provide training to SWCDs staff for the Manure Application Planner (MAP) software developed by Extension.

Area II

- Al Kean continues to work with the Area II board of directors to separate administrative and technical functions currently performed by Darrell Apelgrain, BWSR Area II staff engineer. The objective is to refocus Darrell's work on technical assistance and have administrative functions performed by the Area II board or an administrator employed by Area II.

Wetlands

- Wetland Specialist John Jaschke and Greg Larson assisted field staff in wetland jurisdiction in several Counties; most cases involve jurisdiction by a number of agencies. In a Polk County situation, problems could have been avoided if the landowner would have asked before ditching.

- Staff has spent considerable time tracking the amendments to the Wetland Conservation Act; as the legislative process is nearing completion, attention turns to incorporating the changes into the rule so that legislative intent is met.

- With construction season comes the flurry of phone calls from project proposers and concerned citizens alike; wetlands are certainly sites where different philosophies meet and do not usually agree

- Planning is underway for wetland delineation training for local government staff; the assistance from the Army Coprs of Engineers, DNR, Fish and Wildlife Service, SCS, and the U of M Soil Science Department is greatly appreciated; two four-day seesions are planned this summer in the Brainerd area.

- The Soil and Water Conservation Society will showcase the Minnesota RIM and WCA programs at their annual meeting in Fort Worth Texas this August; this presentation features state efforts that demonstrate integrated resource management.