Chapter 8

Implementation Plan

Introduction

Analysis of data from the two-year water resource investigation shows that reductions in sediment, nitrate-nitrogen, and phosphorus would contribute to improvements in the water quality of Seven Mile Creek and Minnesota River. The technical committee has identified several premeditative actions, which will result in lower amounts of these non-point source derived contaminants. When completed, the implementation plan for the watershed will help to achieve:

- 25% reduction in TSS
- 25% reduction in Phosphorus
- 40% reduction in Nitrates
- Fecal Bacteria below 200col. /100 ml at all times
- Greater habitat quality for fish and other aquatic life
- Increased habitat for wildlife
- More sustainable agriculture

Watershed team members realize that the scope of the environmental and water quality concerns in the Minnesota River Basin and small watersheds like Seven Mile require solutions on a scale commensurate with the magnitude of the problems. Possible federal legislation to change the current farm bill from a corn/soybean-based subsidy to a conservation-based subsidy through the Conservation Security Act is an example of this scale. Likewise, the scale of the implementation plan of Seven Mile Creek does not rely on one funding source or focus on one particular strategy. The implementation plan is designed to be holistic, taking into account the entire ecosystem. As many groups as possible were pulled together to make the implementation plan sustainable, powerful, and long lasting. The project brings together and leverages the experience of farmers, consultants, private enterprise, researchers, local, state, and federal agencies, private organizations, and farmer funded commodity organizations to help address the water quality concerns for Seven Mile Creek. The watershed project is truly an example of leveraging many stakeholders to ensure a successful grassroots watershed effort.

The implementation plan is based on three major components. Those components are education, demonstrations, and structural practices. The implementation plan is based on three years. Many water quality improvement tools to reduce non-point source pollution will be utilized. The success of the project will be documented through watershed resident behavior surveys, before and after the project, as well as intensive long-term monitoring.

Water storage within the watershed of Seven Mile Creek is considered the most important best management practice. Proper nutrient management would have the second largest positive impact on water quality.

Education Based

- Nitrogen Rate Demonstrations that will show producers and fertilizer dealers Economic Optimal Nitrogen Rates thereby encouraging a more efficient rate of nitrogen and decreasing "insurance nitrogen." The goal is to obtain as many farmers to participate in the program.

- Hold workshops and one to one training in cooperation with an agronomic consulting firm to share with farmers a new record keeping system to ultimately enhance and simplify nutrient management decisions. Watershed staff will also be trained.

- Promote the use of minimal tillage or no tillage of soybean residue within the watershed.

- Work with schools, citizen groups and County Park staff for educating ecosystem based natural resources management. Develop environmental education display in kiosk within County Park.

Demonstration Based

- Incorporate rye vegetation as a cover crop after soybean or corn harvest to reduce wind, and soil erosion while at the same time decreasing nitrogen leaching. Use rye on Red Top Farms Research Fields and other farms. Disseminate the information via field days.

- Host strip tillage demonstrations within the watershed.

- Promote soil, and manure testing.

Structural Based

- Work with dairies and producers to incorporate alfalfa along drainage ditches or target areas as identified by the Revised Universal Soil Loss Equation.

- Install continuous signup CRP-Filter Strips and riparian strips on the remainder of tributaries within the watershed. Also install buffer strips along the cropped upland and steep sloped transitional interfaces. Assuming a 100-foot buffer along all ditches or tributaries in the system, this would account for 600 acres. Acquiring 300 acres or roughly half of the eligible riparian areas would be an aggressive yet realistic goal considering the time frame.

- Install waterways in critical areas identified by watershed inventories.

- Construct or restore wetlands in critical areas for water storage and de-nitrification purposes utilizing the CREP permanent easement program, or new Federal Farmed Wetland Pilot Program, along with the McKnight Foundation. Divert nearby sub-surface tile lines into structure to further increase de-nitrification. Three sites are currently being proposed for CREP or FWP enrollment through the SWCD and NRCS.

- Install rock cross-vane structures at Highway 99 site for dual purposes. The placement of the rocks within the stream channel will redirect stream flows away from an eroding bank site. Design the cross vane to direct the more frequent 5 year storms into a floodplain area for

storage and de-nitrification purposes. This will also serve as a demonstration for other watershed projects. The SWCD board and staff will help administer this program.

- Convert open tile intakes to gravel inlets to reduce field derived sediment and phosphorus loads. Goal is to convert 50 intakes or about 20% of the open intakes within the watershed.

- Fix non-complying septic systems. Goal is to upgrade 70 non-complying homes. This would account for over 70% of the non-complying homes within the watershed.

- Help match efforts to restore in stream trout fishery habitat.

Water quality monitoring, and watershed modeling will continue throughout the scope of the project to improve BMP implementation and communication. Along with the fore mentioned, surveys and interviews will be conducted before and after the watershed project to track behavioral changes and the overall success of the watershed project.

Included within this chapter is: a list of those groups which will be involved in the second phase of the water quality project, why the particular voluntary Best Management Practices (BMPs) were selected, activities to reduce the pollutants of concern, how some of the practices listed above will be implemented and their net effect on the water quality. Last of all, a budget needed to carry out the proposed activities is included at the end.

The watershed project is requesting $196,432 in grants from the Minnesota Clean Water Partnership Phase II Implementation program to carry out the proposed water quality improvement strategies. An additional $550,000 in low-interest loan money is being requested from the MPCA to upgrade non-complying septic systems. An additional $19,380 in cash is being leveraged from Nicollet county and other grant sources (SWCD $4,500, Environmental Services $2,500 and DNR Environmental Partnerships $7,380). An additional $120,000 from the McKnight foundation could be leveraged if a recent grant request is funded[1]. This brings the total grant amount to $765,812. With in-kind matching sources from the paired watershed study, and other watershed partner allocations, it is estimated that over 1,000,000 dollars has been leveraged for this watershed project. An equivalent full time person will be hired to coordinate and administer the proposed activities. The preliminary implementation plan contained within this chapter covers a time frame of three years; we expect that these activities can be completed by spring of 2005.

Watershed Partners

- Center for Agricultural Partnerships Midwestern Water Quality Project, Based in North Carolina

- Blue Earth Agronomics-Private Consulting Firm based in Lake Crystal, MN

- McKnight Foundation. Possible funding source for the use and study of wetlands as a nitrate reduction practice. Private grant foundation, Minneapolis, MN.

[1] **Representatives from the McKnight Foundation have interviewed BNC Water Board staff and knowledge of approval will take place in the spring of 2002. McKnight Foundation cash contributions are not included in the overall cash budget since the request has not been secured as of the time of this report write-up.**

- University of Minnesota School of Public Health. Craig Hedberg, University Professor and others have been involved in DNA fingerprinting of bacteria, E. Coli, and other new bacteria monitoring techniques. This type of information will help further the understanding of potentially harmful bacteria sources and ways to fix them. Preliminary data was collected in Seven Mile this in 2001.

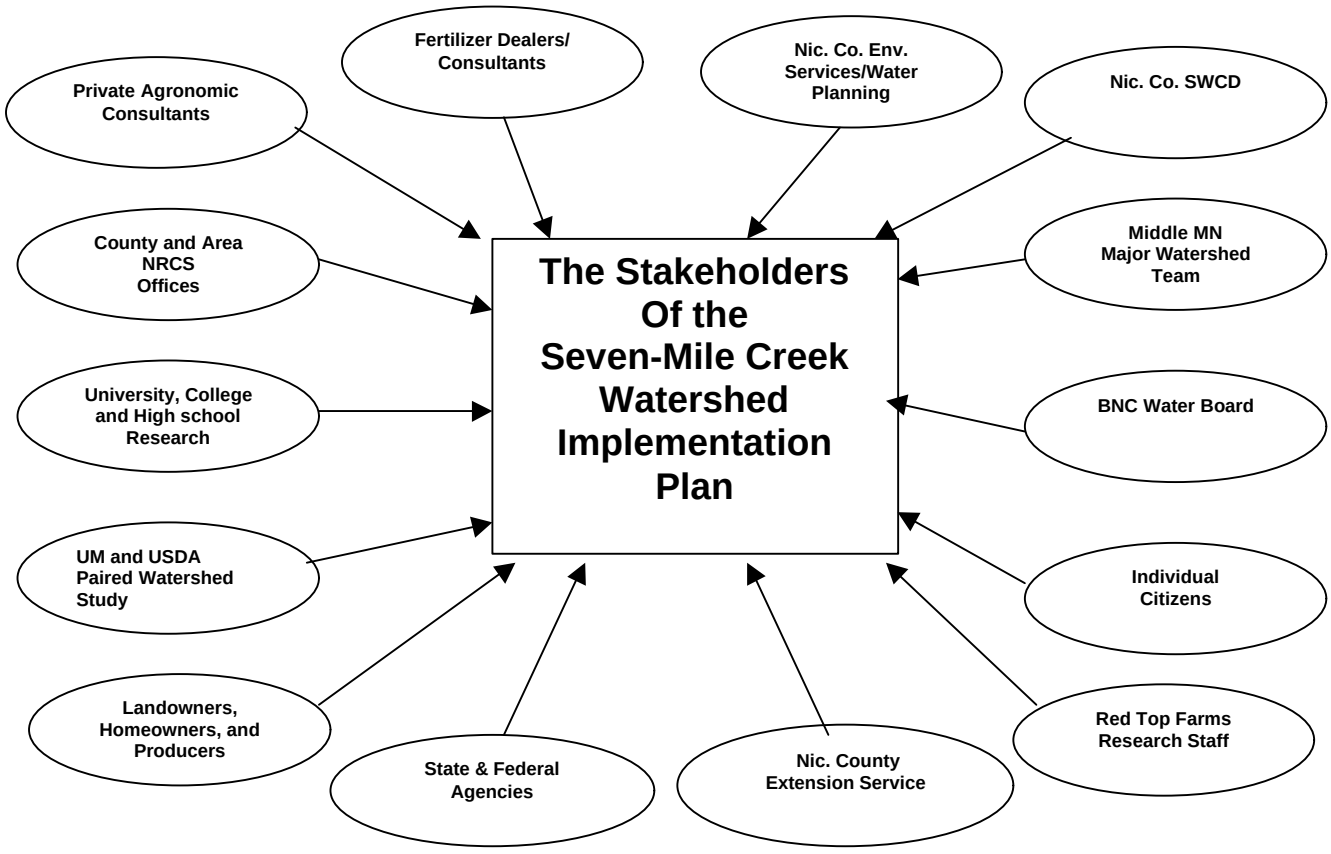
- Iowa State University-William Crumpton-Dept of Biology and Engineering. Assisting with the design, location, and cost/benefit analysis for the use of wetlands as nitrate reduction practices in Seven Mile and Little Cottonwood River Watersheds.

- Paired Watershed Study Team. The study is being conducted under leadership from Dave Mulla, Professor at the University of MN, Department of Soil, Water, and Climate. Includes numerous people at all levels: local, state and federal agencies, universities as well as private groups and businesses.

- Northern Plains Dairy. Working relationship has been established between owners and design engineers of proposed 3,000-cow dairy operation within the watershed. Based out of LeSueur MN.

- Nicollet County NRCS, SWCD and Environmental Services.

Implementation Plan Stakeholders



The Nicollet County Soil and Water Conservation District, NRCS, BNC Water Board, water planning, and Environmental Services will be the major facilitators of the implementation plan. Technical designs/engineering, landowner and public relations will be the main role of the SWCD. Education, public relations and management of the septic loan program will be the main responsibilities of the latter two agencies. Projects and consulting will be contracted for those aspects of the plan which agency staff are not qualified to administer.

Best Management Practices

Best Management Practices (BMPs) are defined as those practices, techniques, or measures for preventing or reducing source pollution to a level compatible with water quality goals.[2] BMPs are voluntary practices, which have been scientifically proven through public and private research to improve water quality while at the same time ensuring profit to the landowner and/or producer.

The basis for selecting the BMPs for Seven Mile Creek implementation was based on the following factors:

- Wetter Clays and Silts Agro-ecoregion as developed by U of M and NRCS
- Sediment and nutrient modeling
- Cost of implementing the practice and the respective water quality improvement effectiveness.
- Discussions with watershed residents, SWCDs, NRCS employees, Department of Natural Resources, and other conservation agencies.
- Realistic adoption of the proposed voluntary BMPs by watershed residents.
- Secondary benefits. Habitat for wildlife, general increases in plant, animal and fish diversity, overall enhancement of food production sustainability, and soil quality.
- Recommendations from the Minnesota River Citizens Advisory Committee.

Results of the Citizens Advisory Committee for the Minnesota River as compiled by the MN River Joint Powers Board

1. Restore floodplains and riparian areas
2. Restore wetlands
3. Manage drainage ditches as tributaries
4. Improve land management practices
5. Monitor water quality-track improvements
6. Establish a MN River Commission
7. Establish a Joint Powers Board
8. Improve Technical Assistance
9. Engage the general public
10. Enforce existing law

[2] Descriptions of BMPs taken from, Agriculture and Water Quality; Best Management Practices for Minnesota, and U. S. Department of Agriculture, Natural Resources Conservation Service, Conservation Choices.

Implementation Plan Structure

The BMP implementation plan consists of six major program elements.

1. **Initial Activities**
    - **Work plan development**
    - **Organizing Committees**
    - **Travel**
2. **Best Management Practices**

A. Nutrient Management

- **Phosphorus/Soil Tests**
- **Manure Mgt. Promotions and Demo**
- **Nitrogen Rate/ Timing Promos**
- **Travel**

B. Vegetative Practices

- **CRP Filters/CREP/WRP**
- **Riparian Strips**
- **Alternative crops-cover crops**
- **Waterways**
- **Travel**

C. Primary Tillage Systems

- **Conservation Tillage**
- **Minimum Tillage-soybean acres**
- **Travel**

D. Structural Practices

- **Tile Outlet to Wetland**
- **Wetland Restorations and FWP**
- **Stream Diversions and Rock Inlets**
- **Stream Bank Stabilization and Rock Vanes**
- **Septic System Upgrades**
- **Fish Habitat Improvements**
- **Travel**

3. Monitoring

- **Flow and Water Quality Measurements**
- **TISWA , Inventory, TMDL, and Land Use Assessments**
- **E. Coli DNA and Other Special Bacteria Assessments**
- **Travel**

4. Education and Outreach

- **Newsletters and Mailings**
- **Community Activities**
- **Basin Cooperative Activities**
- **Paried Watershed Collaboratives**
- **Professional & Education**
- **Website Development**
- **Travel**

5. **Data Management and Analysis**

   - **GIS Updates**
   - **Modeling**
   - **Technical Committee Review**
   - **Report Writing**
   - **Travel**

6. **Administration**

   - **Communications**
   - **Fiscal Activities**
   - **Project Direction**
   - **Office Management**
   - **Travel**

Activities to reduce sediments (TSS)

The proposed implementation activities will contribute to a reduction in the amount of soil entering the watershed. Upland non-point source controls include installation of filter strips along ditches and creeks, installation of rock inlets in tiled areas and grass waterways in sloped areas, and promotion of reduced tillage systems. Minimum tillage or no tillage of soybean stubble will be encouraged. Within the riparian area, stream bank stabilization will occur at a highly visible site along a highway. With the help of potential McKnight funding, the use of rock-cross vanes will be utilized to redirect flows away from eroding stream banks. As a second benefit the rock structures will be designed to redirect flows into existing floodplains for further pollution treatments.

Activities to reduce nutrients (phosphorus and nitrogen)

Since nitrates are quite high for this size of watershed, a very large portion of the implementation project will concentrate on the reduction of nutrients. Wetlands, and N -rate demonstrations will be key management strategies. In addition, new management practices such as the use of Rye as a cover crop to reduce soil erosion and decrease nitrogen leaching will be demonstrated within the watershed.

Key phosphorus reduction strategies are listed below.

- Conservation tillage
- Soil Testing
- Banding of fertilizer or injection/incorporation of manure
- Proper record keeping for manure applications
- Proper manure spreader calibration

- Lab analysis of manure nutrient content
- Reductions in animal feed P content
- Use of accurate yields goals to make fertilizer recommendations
- Buffer Strips/ Grassed Waterways
- Replacement of surface tile intakes with gravel inlets

Some of the above projects will also result in lower amounts bacteria entering Seven Mile. Other activities with this goal in mind are: the establishment of nutrient management test plots, animal waste management promotions, and upgrades for onsite sewage treatment systems.

Activities to provide overall water quality improvement

A few of our proposed remediations will provide substantial reductions in sediments and nutrients. Restoration of wetlands and the construction of sediment control basins will allow for settling of suspended solids and nutrient assimilation/deposition. It is felt water storage is perhaps one of the largest and most important BMPs to the project. The CREP program and Farmed Wetland Program will help facilitate this effort. Education is proposed to continue the long-term effort to raise public awareness of impacts on water resources.

BMP 1. Nutrient Management-CAP Project

This program element will be the largest expenditure. Sources of implementation will be derived mainly from the Clean Water Partnership, Center For Agricultural Partnerships (CAP) N-Rate Project, agronomic consulting services, and Red Top Farms research fields.

Nutrient management involves careful management of all aspects of soil fertility, so that crop needs are met while minimizing losses to surface and groundwater supplies. This requires management of nutrients applied to the soil including commercial fertilizers and manure as well as in-place nutrients. Soil tests to determine existing nutrient levels are essential to nutrient management, and are necessary to determine the appropriate fertilizer requirements for a specific soil. The fertilizer application rate should be calculated by using soil test results and Minnesota Extension Service recommendations. The fertilizer application rate should consider the crop, soil type, previous crops, history of manure application, and method of fertilizer placement.

Nutrient management has been shown to have a very beneficial effect on water quality. Through use of proper rates, placement and timing of fertilizer application, loss of nitrogen and phosphorus can be reduced by 50% to 90%. It is easily the most effective way to reduce transport of soluble forms of nutrients to surface and groundwater. Sound nutrient management also reduces input costs, thereby increasing the profitability of crop production.

Despite years of scientific research clearly linking current nutrient management practices to water quality issues and hence, gulf hypoxia problems and lake eutrification problems, and despite efforts detailing changes in practices that can reduce the problem, the agricultural and fertilizer dealer

community has been hesitant to adopt nutrient management programs or abatement practices to reduce the problem. Numerous best management practices that minimize agricultures impact on water quality are known: altering the rate, form, method, and/or timing of nitrogen application; changing cropping practices, tillage systems, installing buffer strips, and controlling drainage systems. Yet a gap continues to exist between awareness and adoption of these technologies. The implementation plan of the SMC project plans to fill these adoption gaps by utilizing on-farm nitrogen rate/economical optimum nitrogen rate demonstrations, record keeping systems, and comprehensive nutrient management plans, on a goal of 60% of the watershed cultivated acres. The CAP project will be a major facilitator of this plan. A contract with Blue Earth Agronomics will be developed to help facilitate the nutrient management as well as other related activities as they develop.

Research conducted from the two-year water quality study has clearly linked nitrogen and land use practices within the watershed to water quality in Seven Mile. This can be demonstrated by the high nitrate loads, 1996 FANMAP nutrient management survey of producers, hydrology/drainage changes, and nitrogen mass balance work. Further promotion and development of the CAP project will be a major initiative within program element 2a. Specifically the SMC project will be partner with the CAP project by serving as CAP project representatives within seven mile creek, setting up plots, disseminating and tracking data, promotion, and encouraging participation. In addition to BNC Water Board and Seven Mile Creek Project there are many other partners including: Minnesota Corn Growers Association, iFARM Group, Precision Agriculture Center-University of Minnesota, National Alliance of Independent Crop Consultants, Corn Economics Group.

The Center for Agricultural Partnerships' Midwestern Water Quality Project is designed to develop and implement cost effective and information intensive nitrogen management systems over large acreage that will benefit the environment and farmers. By creating strong working relationships on the ground with growers, consultants, commodity organizations, universities, lenders and key agricultural businesses the project will achieve the following objectives:

1) Design and implement an information intensive system of field practices for nitrogen management decision-making based on objective field measurements that reduce environmental impacts;

2) Measure and evaluate the impacts of implementing nitrogen management systems at the individual field and regional watershed levels including changes in on-farm decision-making, nutrient usage, acres affected, yield, cost, and net revenue; and

3) Disseminate project progress and results to a) increase adoption and implementation of the nitrogen management system in subsequent years on additional farms, and b) demonstrate to both agricultural and non-agricultural audiences the on-farm benefits as well as the broader water quality and wildlife benefits to the Minnesota and Mississippi River Basins.

The outcomes of the project include: diagnostic tools to identify farmer/consultant decision-making processes to design compatible and effective education, training, and implementation efforts; a field record-keeping system to be used by farmers and consultants to document, quantify, evaluate, and demonstrate benefits from and changes in nitrogen management practices; and a communications program to generate awareness and inform the public on the value of information intensive nitrogen management to farm profitability and the environment.

The Issues

Many producers firmly believe that most land grant university fertilizer recommendations are too conservative and, as a result, frequently use nitrogen rates 20 to 60 lb/A more than the crop can

effectively use. For example in the wellhead protection area of St. Peter, over 90% of the corn acres were receiving 30+ lb/A compared to UM recommendations. Convincing producers that these lower rates will perform under a variety of climatic conditions can be difficult. One effective method is to conduct "on-farm" strip trials over several growing seasons. Figure 40 illustrates the design used at Red Top and is currently being expanded to 10 additional farms in the St. Peter Wellhead Protection area in 2000.

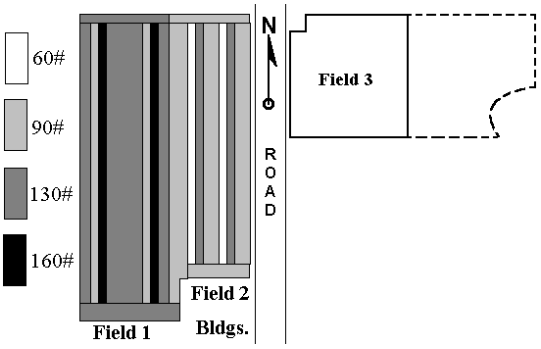


Figure 40. Design of the nitrogen rate strips used in 1997 and 1999 at Red Top Farms.

How CAP works.

Farmers with yield monitors enroll into the project and agree to apply five different rates (60, 90,120,150,180 lbs/acre) of nitrogen on a 50-acre field. The field is geo-referenced and soil types are delineated. After harvest, the GPS yield monitor information is sent to the Precision Agriculture Center-University of Minnesota and Blue Earth Agronomics of Lake Crystal. There the data is statistically analyzed. Economic optimum nitrogen rates are developed. The project also looks at soil types, plant population, seed rate, and other variables to determine the most profitable rate of nitrogen application for each participant. The data collected could help farmers in two ways. First, a better understanding of the nutrient needs of a specific plot could increase a producer's net profits by increasing yields or reducing nitrogen application costs. Second, the data could provide producers with a degree of protection in the event of government regulation of nutrient application rates. Examples of data collected from five farms in around the Seven Mile Creek Project can be found in figures 41 and 42. Results from this study show that the economically optimum N rate for corn ranges from 90-118 lb/ac, significantly less than the typical application rates of 145-185 lb/ac. The theory behind supporting this type of work in Seven Mile is that eventually producers will gradually reduce their rates to levels parallel with University of MN Extension recommendations (120lb./acre). Ultimately, it is hoped producers will make better well-informed decisions and demand a more economical type of fertilizer rate from their dealers and applicators.

Eventually it is hoped the farmers will cut back to UM of Recs. over time. It is estimated that the producers and fertilizer dealers are over applying N by 34 lbs./acre. This equates to an additional 170 tons of potentially leachable fertilizer that may not be needed by the crop every year. This equates to a $75,000 loss for the corn producers. In other words farmers could save $7.50/acre if they trimmed N rates.

Currently 10 farmers within the watershed, accounting for 2,000 acres of the watershed are enrolled in the program. A goal of an additional 10 farmers will be facilitated through the Seven Mile CWP. In return for participating in the project, the farmers receive $500 for possible yield loss and

field set up time. In addition, the farmers receive a book containing geo-referenced maps including field boundary & soil type, yield & moisture, nitrogen application, nitrogen summary of results, result summary done on all the plot fields which will be used in educational and communication efforts, and access to a copy of the project data pool through advisor.

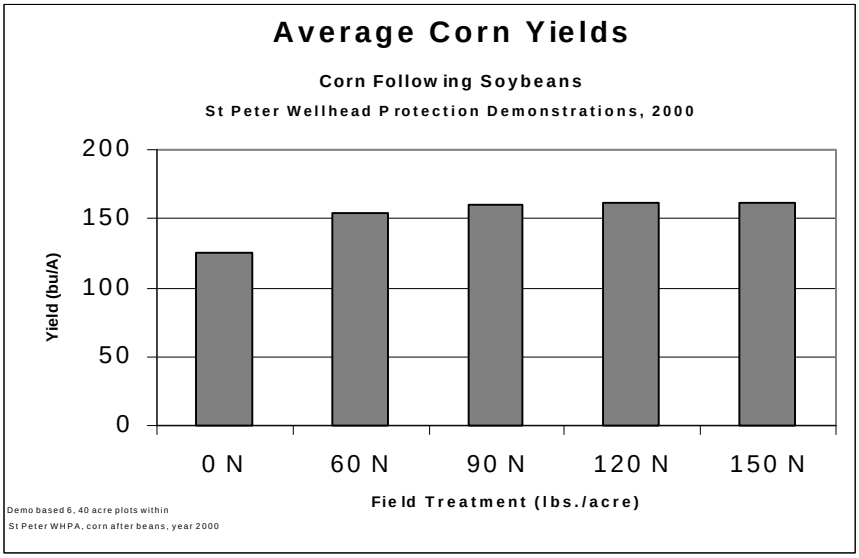


Figure 41. Average corn yields for different nitrogen applications.

Table 35. Economic analysis of nitrogen rates for five producers.

Farm	r^{2*}	Maximum Net Return ($)	Optimum Nitrogen Rate (lbs/ac)
A	0.99	588	118
B	0.74	506	107
C	0.98	553	117
D	0.99	571	108
E	0.52	531	77
**Fitting a quadratic model*			

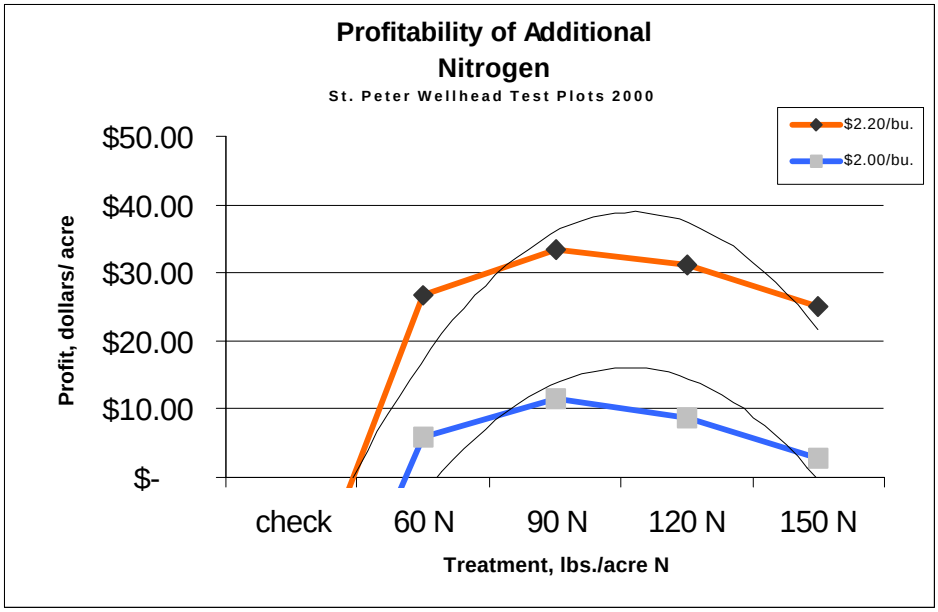


Figure 42. Profitability vs. nitrogen treatment.

Other initiatives involve consultation with fertilizer dealers, and private agronomic consultants to provide the following:

- Train farmers and watershed cooperators how to use field collection software to geo-reference all relevant information, such as tile intakes, buffer strips, weeds, diseases, etc., for inclusion in a GIS record-keeping system

- Establish training courses to help teach watershed farmers how to implement an extensive GIS record-keeping system, to include all field operations, such as crop (rye, corn, soybeans), planting (variety, date, seeding rate), pesticide (product, date, rate, environmental conditions), fertilizer (rate, date, type) tillage, etc.

- Continue to provide and distribute information on the Midwestern Water Quality Project through presentations at watershed meetings.

- Help develop and implement other nutrient management components of the project, such as possible strip till and rye cover crop demonstrations.
  Included in these demonstrations would be:
  - the development of demonstration protocols and farmer/participant agreements
  - contracting watershed farmers to participate in demonstrations
  - coordinating and monitoring of applications or treatments within the project fields
  - geo-referencing of demonstration fields and data associated with the study

- collecting and analyzing of data (yield, crop, planting date, etc.)
- generating reports and disseminating data to participating farmers and the BNC Water Quality Board

BMP 2. USDA and University of Minnesota Paired Watershed Study

Producers have been reluctant to adopt new management practices without research documenting the environmental improvement gained, as well as the direct and indirect costs from potential yield reductions. This project allows producers to get directly involved in determining which BMPs are more feasible for adoption, what they will cost to adopt, and how effective they are at reducing non-point source pollution.

Recently a USDA paired watershed study was funded for nutrient reductions. The farmer led and initiated, is a project to accelerate the voluntary adoption of BMPs for nutrient management in the MN River Basin, and improve waters quality. Farmers have helped to assemble a team of UM soil scientists, economists, and extension educators, local government water planners, state agricultural training and education personnel, BNC water board staff, and local government and policy makers to conduct paired watershed studies in two minor watersheds in western Nicollet County (minor watershed 28074 and 28075) along with Seven-Mile Creek (minor watershed 28062 and 28066). Specific objectives of the project use vigorous scientific approaches to:

1) Work with producers and agency personnel to develop a menu of BMP options that are feasible for adoption, maintain crop and animal productivity, and are effective at reducing nutrient losses from cultivate cropland to the MN River basin.

2) Measure the extent of water quality improvements in a Huelskamp Creek minorshed after implementation of BMPs relative to paired minorshed adjacent to the study watershed without BMP implementation. In addition compare the paired watersheds with a watershed that is undergoing a conventional local government led watershed project (Seven Mile proposed Clean Water Partnership) with the control and artificially induce BMP watershed.

3) Estimate the costs and benefits of water quality improvements achieved in paired watershed studies, and assess the potential for differential economic impacts of specific BMPs based on selected producer characteristics.

4) Develop public education programming to increase the adoption of BMPs pertaining to the MN River basin thereby improving water quality and maintaining farm productivity.

As apart of this paired watershed study, the Seven Mile project will benefit greatly in terms of increased in-kind support. It is estimated that about $20,000 will be leveraged from the paired watershed study.

- Increased educational strategies with the development of fact sheets and brochures and field days.

- ADAPT Water Quality Modeling-Very intensive and robust model, which evaluates the long-term impacts of changes in farm nutrient management. Used to simulate nutrient loads given certain “what if scenarios.”

BMP 3. Red Top Farms –Cover Crops such as Rye for de-nitrification purposes

Red Top Report

The ability to demonstrate the effectiveness of Best Management Practices (BMPs) is in an important component in the 1989 Ground Water Protection and Clean Water Act. A ninety-acre site located on the Red Top Farm near St. Peter provides a unique opportunity to study the quality and quantity of water and agricultural chemicals moving through the subsurface tile drainage system. Results from Red Top fills a critical gap between university research, which is typically conducted on a small-scale under a very controlled environment, and effectiveness on a production-scale.

For the last five years, two 60-acre fields in watershed 2 of Seven Mile Creek watershed had been monitored for nitrate and pesticide losses from tile line drains before and after adoption of reduced rates of nitrogen fertilizer application. In response to reduced nitrogen fertilizer application rates, tile drain nitrate rates tile drain nitrate concentrations decreased from over 25 mg/l to about 12 mg/l (figure 43). Implementation of existing nitrogen BMPs and University of Minnesota Fertilizer Recommendations resulted in a significant reduction in fertilizer inputs, maintained yields, and appears to have decreased nitrogen losses by 40 to 50 percent. Additionally, the results have been extremely positive for the majority of pesticide products that have been studied since 1996.

The overall concept of Red Top has proven to be a highly effective educational approach for farmers, agricultural professionals, and the non-agricultural community. The site has hosted many educational field days and has been featured in numerous agricultural magazines and newspaper articles.

Red Top Farms will be a great asset to the watershed project and therefore is included in the CWP implementation phase. Specifically the watershed will work closely with Red Top by:

- Incorporation of rye and organic sources of nitrogen such as manure on Red Top Farm Research fields and other fields in the watershed to assess the water quality benefits feasibility, and real world agricultural applications. Northern Plains Dairy could be a very large stakeholder in this research as well.

- Continue to evaluate crop response to various rates of N in corn-soybean rotations on soils specific to watershed producers.

- Increase producer's confidence in UM Nitrogen recommendations (120 lbs. N/acre).

- Host educational field days and promotional materials for watershed residents and conservation groups.

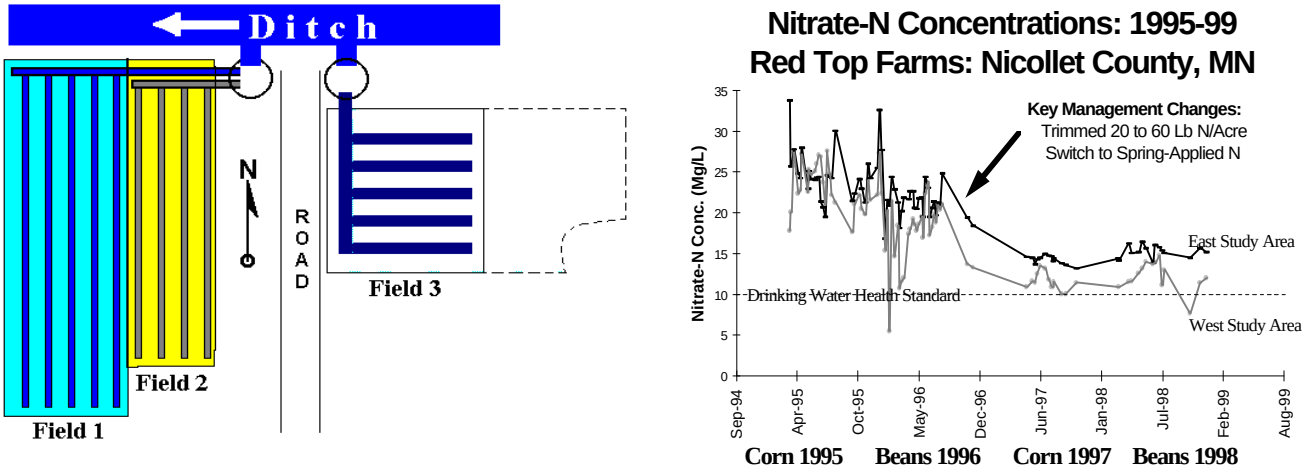


Figure 43. Field layout and nitrate concentrations at Red Top Farms.

BMP 4. McKnight Foundation Grant Proposal-Denritification, Bank erosion restoration and water storage

On September 28 of 2001, a representative from the McKnight Foundation interviewed BNC Water Board Staff after review of wetland demonstration project proposal submission. Possible funding could occur by January of 2002.

Wetland restoration or development can be achieved through use of small structures such as dikes to add water or regulate water levels in an existing wetland. Restoration can also be achieved by filling a surface drain or removing a subsurface drain. County or judicial ditches can also be modified to temporarily impound water. This practice is consistent with M.S. 103E, and can be accomplished in a way that does not impede drainage functions.

Wetlands are efficient sediment traps, preventing soil particles and attached pollutants from reaching lakes and streams. They also provide some removal of dissolved nutrients from runoff during the growing season. Wetlands provide habitat for waterfowl and other wildlife species and serve an important storage function in the watershed to help reduce peak stream flow.

In combination with traditional best management practices to reduce non-point source pollution it is felt that diversion of high pollution water through storage structures is one of the only few realistic ways to achieve water resource goals while considering the social, economic, and political systems within the watershed basin. Through the possibility of McKnight Foundation and CWP funding, project staff will treat nitrogen and high flows in two ways using wetland/detention practices. The first involves utilizing natural floodplain to reduce nitrogen and second involves diverting subsurface tile lines into existing or restored wetlands to further treatment of nitrogen and high flow events. The theory is that once water is detained for at least 2-3 days, anaerobic bacteria which thrive in those types of conditions will consume oxygen from No_3 thereby reducing it to N_2 gas (denitrification)

In Seven Mile, three potential sites have been identified. The following describes one of the proposed sites near a drainage ditch in which steam flows could be diverted away from an eroding stream bank and at the same time increase the frequency of (5-10 year storms) floodplain access through the use of rock cross-vane structures. Map 35 shows the location of the possible nitrogen, stream bank and flow reduction mitigation site. In addition there are currently two to three 20-acre

wetland complexes that have the possibility of being enrolled into the CREP program within watershed 2. If the wetlands are enrolled into the program, the project hopes to divert subsurface tile lines into the wetlands to further nitrate reductions. Monitoring before and after the wetlands would also take place.

Riparian Nitrate-nitrogen Treatment Wetlands

Joe Magner

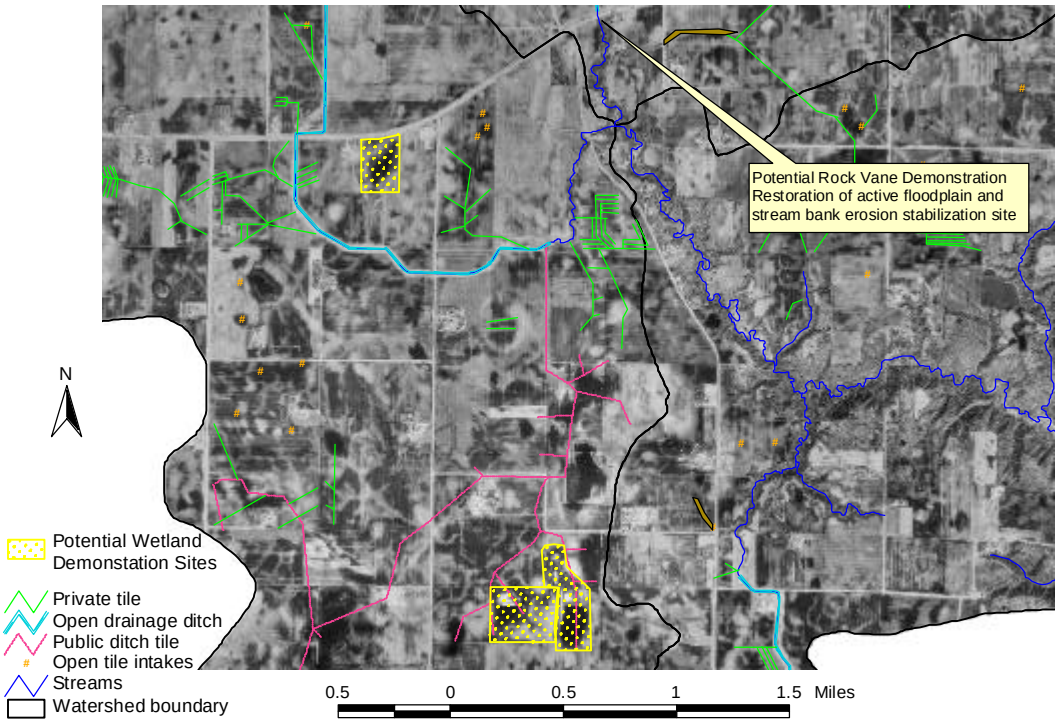
This proposal seeks nitrate-nitrogen load reduction in the Minnesota River by intercepting moderately high flow runoff at strategic locations in the Middle Minnesota watershed.

Seven Mile Creek has a significant grade change below state highway 99. There is a wooded riparian area that has several acres of accessible floodplain. The plan at this location would involve the construction of a cross-vain in the Seven Mile Creek channel. The cross-vain would consist of large diameter rock placed at the bankfull or channel forming stage. This low head structure will cause moderate or frequent floods (1-5-year) to spread more fully across the accessible riparian floodplain. Because of the change in hydraulic gradient in this reach, flood water will tend to have a slightly longer hydraulic residence time. We anticipate the combination of increased hydraulic residence along with vegetative contact will reduce nitrate-nitrogen concentrations in Seven Mile Creek by 2005.These systems are designed to be low maintenance, however, snag removal will be necessary to prevent off-shoot plugging and any channel or bank erosion. Nitrate-nitrogen loads and concentrations will be measured entering and exiting treatment wetlands to assess the effectiveness of the nitrate-nitrogen removal.

Map 35

Potential Nitrogen Remediation Sites

Seven Mile Creek Watershed



Why Special Wetlands?

The Board and staff have identified eight reasons for trying this pilot project now:

1. The watershed projects have the data and data analysis sufficient to demonstrate the need for the wetland installations and to provide good evaluation of their effectiveness throughout the timeline of the project.

2. To effectively reduce pollutant loads and address the magnitude of the nutrient problems in south-central Minnesota watersheds, the natural denitrification processes found in wetlands and floodplains are needed to treat the high nitrate waters.

3. Success of this project in Iowa (Raccoon River Watershed) and Illinois (Des Plaines River Watershed) warrants its replication here.

4. The component of nutrient and sediment loading that comes from bank erosion is substantial enough to warrant a deceleration of the waters as would be afforded by the rock vane components. In Seven Mile Creek watershed it is estimated that 50% of the sediment load is derived from bank erosion. Most of this is attributed to increased surface and tile drainage within the watershed over the past century along with climatic changes.

5. These projects are at the early stages of implementation; adding these installations would enhance their overall visibility.

6. These projects have a large number of collaborators; the group consensus is that the timing is right to try additional and innovative remediation strategies.

7. Utilizing the Conservation Reserve Enhancement Program (CREP) makes this effort very timely. Ideally, SWP sites would be on CREP lands or have CREP eligibility. The Minnesota River CREP program ends September 30, 2002.

8. Leveraging of labor, education, monitoring by piggybacking on the existing projects such as Clean Water Partnerships, McKnight Foundation, and CREP will help keep the costs relatively low.

BMP 5.

Riparian Buffer Strips and Set-aside Programs

Riparian buffers consist of trees and other and other vegetation located in areas adjacent to streams and drainage ditches. The presence of permanent vegetation along a waterway is primarily designed to intercept surface runoff and help trap or remove nutrients, sediment, organic matter, pesticides, and other pollutants prior to entry of surface waters. Riparian buffers also serve to stabilize eroding banks and increase wildlife nesting and food habitat. Sediment delivery reductions up to 80% have been reported on 4% slopes where buffers have been installed.

(Implementation for SMC)

Another major component of the SMC Implementation Plan is to facilitate the enrollment of agricultural land into federal and state set-aside programs. Specifically, areas that will be targeted are riparian corridors (areas within 100 feet of drainage ditch or intermittent stream). Project staff will work individually with each producer to explain programs (CREP, CRP, Continuous CRP, RIM, WRP, SMC project programs, and others) to encourage participation, and to assist with program applications.

The strategy for increasing CRP buffers will consist of:

- Initial letter to all watershed landowners advertising the program and staff working with it.

- The mass watershed mailing will be followed by an actual $/acre calculation using GIS digital orthophotos, soil maps, and CRP excel spreadsheet. The calculations will show an air photo outlining eligible continuous CRP acres on each individual's property. A follow up phone call and visit to high priority areas will follow the mailing.

Farmed Wetland Pilot Program

The watershed project will try to take advantage of the many state and federal programs that already exist. Besides the CREP program, the new pilot Farmed Wetland Program (FWP) will be promoted to increase water storage and nitrogen treatment.

There is a new option for landowners with wetlands and prior converted cropland. The Farmable Wetland Pilot Project (FWP) is a new CRP practice that allows landowners to enroll small wetlands and prior converted cropland into a conservation program. The FWP falls under the CRP continuous sign-up so there is no competition or bidding process. The voluntary program offers annual rental rate payments and cost share assistance to establish resource cover on eligible land. Payments are very similar to those someone would receive for enrolling a grass filter strip. Eligibility requirements are:

- Row cropping history of at least 3 of the last 10 years
- No land on a flood plain is eligible
- Maximum wetland size is 5 acres
- Buffers enrolled around the wetland may not exceed three times the size of the wetland or 150 feet in width, whichever option is greater

Both producers and the environment stand to benefit from the FWP. First, landowners receive regular competitive payments for the retirement of marginal cropland. Payments are for 10 to 15 years depending on the length of the contract. Second, the FWP provides a good alternative to the Wetlands Reserve Program (WRP) as small sites do not generally compete well for WRP funding. Finally, enrolling land in the FWP will improve water quality, reduce flooding and enhance wildlife habitat while maintaining or even improving a landowner's bottom line.

BMP 6.

SMC Filter Strip

This conservation program is designed to be more flexible compared to the previous two programs, however does not pay as much per acre. This program was tailored to the needs of the SMC watershed and was designed to be flexible for the landowner therefore increasing overall participation. It was modeled after the very successful Lake Hanska Filter Strip Program.

A goal of five acres will be installed, mainly along cropped tributaries of SMC, waterways and highly erosive transitional areas. The vegetative buffer strip will be established for 10 years. SWCD Stage Cost-share paper work will be utilized for the contracts. A payment of $1000 per acre is the incentive payment for a minimum ten-year commitment. Strip widths between 33 and 200 feet will vary, depending on the width needed to be effective. Seeding will be of either warm season or cool season grasses. Unlike CREP and CRP, this program allows the filter strip to be utilized for a hay crop if desired between August 1-15 with a minimum stubble height of 8". Demand for this program would mainly come form dairy farmers near the middle and lower portion of the watershed. This project will not be encouraged to the extent of the CRP program, however where gaps exist this program is an option.

BMP 7.

Grassed Waterways

A grassed waterway is a natural or constructed channel, usually broad and shallow, that is planted with grass to protect soil from erosion by concentrated storm flow. Runoff water that flows down the drainage way flows across the grass rather than eroding soil and forming a gully. An outlet is often installed at the base of the drainage way to stabilize the waterway and prevent a new gully from forming.

Grassed waterways are estimated to reduce sediment losses from the flow area by 60 to 80 percent. Although grassed waterways act as a filter to remove sediment from runoff, waterways should not be utilized primarily as a filter strip because siltation leads to reduced filtering capacity. Likewise, the watershed above a waterway should be treated to control erosion before construction to prevent the waterway from prematurely filling in with sediment. Vegetation may be difficult to establish in a waterway, so erosion control barriers or mulching may be needed during vegetative establishment.

The watershed survey indicated many areas where waterways would be especially affective in controlling sediment and phosphorus runoff. A goal to install waterways on all of these areas is being proposed for the watershed. The SMC project would utilize state and federal programs as well as SMC filter strips to increase enrollment.

BMP 8.

Rock Inlets and other Tile Intake Alternatives

Rock Inlets

Surface, or open tile inlets are believed to be a direct pathway for sediment and nutrients to reach surface water. Although they are a useful component of cropland drainage systems, they do not allow for adequate filtration of runoff.

A counter practice to surface inlets is that of rock inlets. There are several configurations of this practice, but most commonly, it requires a fabric-covered perforated tile placed in a trench and connected to the existing tile line. The trench is filled with varying sizes of rock to one foot above ground level. This system eliminates the above-ground tile inlet. Normally this trench is approximately twelve feet long by three feet wide and three feet deep. Runoff from the surrounding landscape is filtered through the trench rather than drained through a pipe as before. Preliminary research indicates that approximately one-half of the sediment delivered through surface inlets are delivered through rock inlets.

Because rock inlets do not substantially interfere with use of farm machinery, they are well received within the farming community. Crops can be planted over the inlets, but care should be taken around them when doing tillage. Maintenance needs are limited to removing and replacing the top twelve inches of rock after drainage efficiencies have decreased.

Photo 13. Rock inlet installed by BNC staff in Lake Hanska watershed.

The project proposes to cost share replacement of open tile intakes with gravel inlets at a cost share rate of 75%. It is estimated that approximately 300 open tile intakes exist within the watershed. At an average cost of $250.00 per install this would cost a total of $75,000 or $56,250 when cost shared at 75%. Since open intakes account for an estimated 10-15% of the sediment and phosphorus in Seven Mile Creek, about 12% from the implementation budget will go to this effort. This equate to roughly $14,000 needed for approximately 55 open tile intake replacements. The rock Inlet program will model after Carver Co. SWCD and the successful Lake Hanska Project Rock inlet Program. The design is simple in that sediment and therefore attached phosphorus is reduced since runoff is filtered through a bed of rock before reaching the tile line. Currently BWSR and NRCS is looking at cost share for this, but has not decided as of this date until further research has been completed in regard to the rock inlets longevity. SMC project would help increase the enrollment of rock inlets, and alternatives such as close pattern tiling to mitigate the negative effects of open intakes. As ongoing research through the University of MN-LeSueur County Rock Inlet Research Site-Donny Eiler Farm, and other studies become available it will be incorporated into the promotion and use of this practice.

BMP 9.

Livestock and Feedlot Waste Management

Rain Gutter Construction

Livestock waste management practices are important methods of addressing nutrient concentrations in area streams. One cost effective way to keep runoff from feedlots entering waterways is through clean water diversion. By helping cost share roof gutters and other water diversion practices on barns and pole sheds, clean rainwater is kept away from stored manure sources. Constructing roof gutters on buildings near feedlots is a very cost effective an popular way in reducing potential manure runoff into waterways.

Spreading Acres

Runoff from feedlots is not considered a very large contribution to pollution problems within the watershed. A more efficient use of watershed resources will be directed toward proper manure management such as crediting, manure testing and incorporation. A Agronomic consultant will be contracted to perform proper manure handling, crediting and spreading within the watershed.

BMP 10.

Residue Management

Residue management is the practice of leaving last year's crop residue on the soil surface by limiting tillage. Tillage practices (conservation tillage) that leave at least 30% of the soil surface covered with crop residue are suitable to achieve adequate residue management. No-till, mulch till, and ridge till are three of the various techniques used to meet the 30% residue coverage rate.

Conservation tillage is effective for controlling soil erosion and helps control loss of nutrients that are attached to soil particles. Time, energy and labor savings from fewer tillage trips are related benefits of reduced tillage. These savings can offset the cost of tillage equipment needed to achieve adequate residue management. Residue management also helps maintain or develop good soil health, improve water infiltration and reduce evaporation from the soil surface while providing food and cover for wildlife.

The practice of residue management (>30% residue) does create additional challenges for the farmer. Factors such as crop sequence, soil texture and drainage, and climate must be considered. Under heavy residue conditions, well-drained soils are generally better suited to reduced tillage than poorly drained soils. Soil warming and drying can be delayed in the spring if high levels of residue are left on poorly drained soils.

Within the SMC watershed, loans from the AG BMP program will be used to help farmers purchase conservation tillage equipment at reduced rates. Since most of the watershed upland soil erosion occurs on the more highly erodible soybean stubble, minimum or no tillage will be promoted on soybean ground. Strip tillage demonstrations with cooperation of local dealerships will also be considered. Nicollet County Extension, NRCS, and SWCDs will be large contributors to this part of the plan.

BMP 11.

Individual Sewage Treatment Systems (Septic Systems)

Septic systems are recognized as an acceptable means for treating wastewater. The system consists of a septic tank and drain field. The septic tank provides a place for large solids to settle and to be decomposed by microorganisms. The drain field removes fine solids and destroys accompanying bacteria. Effluent from a septic tank contains solids, phosphorus, nitrogen, chloride, bacteria, viruses, and organic chemicals. For this reason, it is illegal to discharge a septic tank directly to a tile line or other surface water.

Pollutants from a properly sited, installed, and maintained septic system will be adequately treated within two to three feet below the drain field. Soil characteristics are important considerations in the design and installation of septic systems. A poorly functioning septic system is a threat to the water quality of nearby streams, lakes, and groundwater. Routine maintenance is critical to prevent

septic system failure. The tank should be inspected at least once every year, and, with ordinary use and care, the tank should be pumped every one to three years.

Based on historical and current data acquired form ES of Nicollet County, it is estimated that approximately 96 of the 160 homes (60%) within the watershed have non-complying septic systems and therefore pose an imminent threat to human health (ITHH). In other words the septic system has a holding tank however does not have a drain field to treat the unsettled portion of the human waste effluent. In most cases the septic tank is connected to the nearest subsurface drainage tile. Due to the expansive network of sub-sufrace field drainage tile, this effluent eventually reaches the drainage ditches and Seven Mile Creek. High fecal coliform and phosphorus levels during low flow periods reconfirm these findings. The implementation plan for SMC requests $550,000 in state revolving funds (SRF) or low interest loan money for upgrading non-complying septics. Septic system upgrades within this watershed average $7500. More expensive mound systems are needed due to the extremely slow percolation rate of the Canisteo, Nicollet, Webster soil associations. The loan amount request would therefore upgrade over 70% (73 homes) of the non-complying homes within the watershed and reduce the immanent threat to public health dramatically. It is estimated that about 15% of the phosphorus load could be reduced as a result of upgrading these systems and fecal coliform bacteria levels at low flow periods could be cut in half. The county feels all of this money could be used to upgrade non-complying systems within the watershed and would take about 2-4 years. The program has been very successful in the past for updating septics and the grant request from the phase II is highly supportive by Nicollet County. The program would be administered through the Nicollet County Zoning and Planning office and environmental offices. The money would be transferred into already established “septic

BMP 12.

Streambank Restoration

Streambank erosion is a continually occurring natural condition that can be greatly accelerated by human activity. Over time, natural streams tend to reach equilibrium so that erosion at one location is roughly balanced by deposition at another. Human alterations to hydrologic and stream flow patterns can, however, upset this balance and lead to severe consequences. Streambank failure, defined as the collapse or slippage of a large mass of bank material into the steam, is one example of what happens when this balance is upset.

Because of the complexity of physical processes affecting streams, there is not one single type of streambank failure, but may different types. Consequently, streambank protection or restoration practices must be tailored to the specific causes of the streambank problem. Through an understanding of the problem’s cause and selection of the proper bank protection method, the likelihood of protecting an eroding streambank is significantly increased.

Bioengineering represents an attractive alternative to the use of rock riprap for streambank protection. This approach combines mechanical, biological, and ecological concepts to arrest and prevent shallow slope failures and erosion. Immediate soil reinforcement is achieved by specific plant arrangements at the site. In conjunction with the vegetative cover, structures should also be used. Structures stabilize slopes during the critical time for seed germination and root growth. A well-established root zone will provide shear strength and resistance to sliding. Overall benefits of bioengineering practices include slope stabilization, improved infiltration, runoff filtration, excess moisture transpiration, ground temperature moderation, habitat improvement, and aesthetic enhancement.

Bioengineering techniques can be used to develop sustainable systems for slope or streambank protection. The combination of correct assessments of stream corridors along with bioengineering practices has proven to be cost effective and environmentally sensitive. Installations can be labor intensive, but less costly than conventional engineering solutions.

Within the watershed, "hot spots" where excessive stream bank erosion is occurring will be stabilized according to SWCD and NRCS recommendations.

Table 36. SEVEN MILE CREEK IMPLEMENTATION PLAN - CASH EXPENDITURES

Program Element	Labor Hours	Labor Total*	Travel	Equipment & Supplies	Technical & Contracts	Educational Materials	Total
1 Initial Activities	180	4,915	50				4,964
2A. Nutrient Management	770	21,021	650	240	18,500	250	40,661
2B. Vegetative Practices	860	23,478	500	220	8,000	250	32,448
2C. Primary Tillage Systems	210	5,733	150	100	5,639	100	11,722
2D. Structural Practices	540	14,742	550	465	10,000	500	26,257
3 Monitoring	700	19,110	1,750	5,000	14,900		40,766
4 Education & Outreach	500	13,650	600	1,328	2,000	3,000	20,578
5 Data & Planning	440	12,012	500	1,000	4,450	250	18,212
6 Administration	480	13,104	400		6,700		20,204
Totals	4,680	127,764	5,156	8,353	70,189	4,350	215,812

* Labor is calculated at $ 27.30 per hour salary & fringe benefits averaged over the three-year period

Table 37. SEVEN MILE CREEK IMPLEMENTATION PLAN IN-KIND CONTRIBUTIONS

Program Element	BNC WQB	Nic. County	Colleges & U of MN	Citizens	Businss es	Basin Team	Brown Nic. E. H.	NRCS	State Agencies	Totals	Other In-Kind (not counted in CWP Budget)
1	1,915									1,915	
2A					21,500				5,000	26,o00	
2B		4,950			1,500					6,450	15,655
2C		1,650							3,000	4,650	
2D		3,850		550,000				1,000	3,300	558,150	120,000
3			2,200				9,000		4,500	13,700	
4	2,635				500	820			3,020	6,975	
5		5,250	20,000		500			1,000	2,000	28,750	
6	16,715							1,365		18,080	
Totals	21,265	15,700	22,200	550,000	23,500	820	9,000	3,365	18,820	664,670	135,655

Seven Mile Creek Budget

Clean Water Partnership Implementation

Program Element		Cash	In-Kind	In-Kind Support Agency	TOTAL	NA/IK
1. Initial Activity						
	Workplan Development	$2,730.00	$1,365.00	BNC	$4,095.00	
	Organizing Committees	$2,184.00	$550.00	BNC	$2,734.00	
	Travel	$50.00			$50.00	
	Subtotal	**$4,964.00**	**$1,915.00**		**$6,879.00**	
2. BMPs						
2A. Nutrient Management						
	Phosphorus/Soil Testing	$9,144.00	$4,000.00	Blue Earth Agronomics	$13,144.00	
	Manure Mgmt. Promotions & Demo	$10,782.00	$4,000.00	N. Plains/MDA/Blue Earth Agronomics	$14,782.00	
	Nitrogen Rate/Timing Promos	$20,085.00	$18,250.00	CAP-Blue Earth Agronomics	$38,335.00	
	Travel	$650.00			$650.00	
		$40,661.00				
2B. Vegetative Practices						
	CRP Filters/CREP/FWP	$1,092.00			$1,092.00	$15,655.00 CREP
	Riparian Strips	$10,368.00	$3,150.00	SWCD/NPD	$13,518.00	
	Alternative crops-cover crops- ex. rye	$16,250.00	$1,650.00	SWCD/NRCS	$17,900.00	
	Waterways	$4,238.00	$1,650.00	SWCD/NRCS	$5,888.00	
	Travel	$500.00			$500.00	
		$32,448.00				
2C. Primary Tillage Systems						
	Conservation Tillage	$10,253.00	$1,650.00	BWSR	$11,903.00	
	Minimum tillage-soybeans	$1,319.00	$3,000.00	MDA	$4,319.00	
	Travel	$150.00			$150.00	
		$11,722.00				
2D. Structural Practices						
	Tile Outlet to Wetland	$2,641.00	$1,650.00	SWCD/NRCS	$4,291.00	
	Wetland Restorations	$7,000.00	$2,050.00	SWCD/NRCS	$9,050.00	$35,000.00 McKnight
	Stream Diversions and Rock Inlets	$13,000.00	$500.00	SWCD/NRCS	$13,500.00	35,000.00 McKnight
	Stream Bank Stabilization and rock vanes	$1,000.00			$1,000.00	$20,000.00 McKnight
	Septic System Upgrades	$1,545.00	$554,400.00	ESD & Citizens	$555,945.00	
	Fish Habitat Improvements	$521.00	$3,300.00	DNR	$3,821.00	
	Travel	$550.00			$550.00	
		$26,257.00				
	Subtotal	**$111,088.00**	**$595,250.00**		**$706,338.00**	$135,655

3. Monitoring					
	Flow & WQ Measurements	$35,990.00	$11,500.00	BNEH/Met C.	$47,490.00
	TISWA & Land Use Assessments	$1,638.00			$1,638.00
	E. Coli DNA & Other Special Assessment	$1,638.00	$2,200.00	SPH-Uof M	$3,838.00
	Travel	$1,500.00			$1,500.00
	Subtotal	**$40,766.00**	**$13,700.00**		**$54,466.00**
4. Education & Outreach					
	Newsletters & Mailings	$5,365.00	$2,635.00	BNC	$8,000.00
	Community Activities	$5,822.00	$3,520.00	NP and MES	$9,342.00
	Basin Cooperative Activities	$1,911.00	$820.00	Middle MN Team	$2,731.00
	Paired Watershed Collaboratives	$2,730.00			$2,730.00
	Professional & Education	$3,138.00		Extension	$3,138.00
	Website Development	$1,092.00			$1,092.00
	Travel	$520.00			$520.00
	Subtotal	**$20,578.00**	**$6,975.00**		**$27,553.00**
5. Data Management & Analysis					
	GIS Updates	$4,934.00			$4,934.00
	Modelling	$8,160.00	$20,000.00	Paired Watershed Study	$28,160.00
	Technical Committee Review	$1,638.00	$8,750.00	All (Technical Committee)	$10,388.00
	Report Writing	$2,980.00			$2,980.00
	Travel	$500.00			$500.00
	Subtotal	**$18,212.00**	**$28,750.00**		**$46,962.00**
6. Administration					
	Communications	$5,430.00	$1,640.00	BNC	$7,070.00
	Fiscal Activities	$6,144.00	$8,460.00	BNC	$14,604.00
	Project Direction	$5,164.00	$2,457.00	BNC	$7,621.00
	Office Management	$3,066.00	$4,158.00	BNC	$7,224.00
	Travel	$400.00	$1,365.00		$1,765.00
	Subtotal	**$20,204.00**	**$18,080.00**		**$38,284.00**
	TOTALS	**$215,812.00**	**$664,670.00**		
	TOTALS NA/IK		**$135,655.00**		**$1,016,137.00**

Total Grant Amount	$215,812.00
Nicollet County & DNR Cash Contributions	$19,380.00
PCA Grant Request	$196,432.00

Nicollet County Cash Contributions		
SWCD	$4,500.00	$1,500/yr
Env. Services	$7,500.00	$2,500/yr
DNR Grant	$7,380.00	
Total	$19,380.00	

Low interest Loan Monies for Septics	$550,000.00
Total	$746,432.00

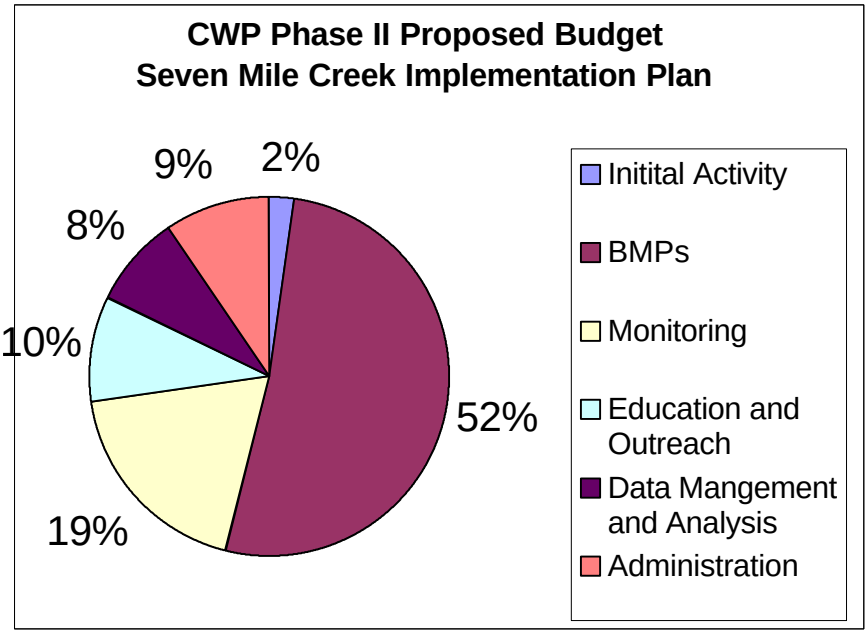


Figure 44. Proposed Seven Mile Creek budget.

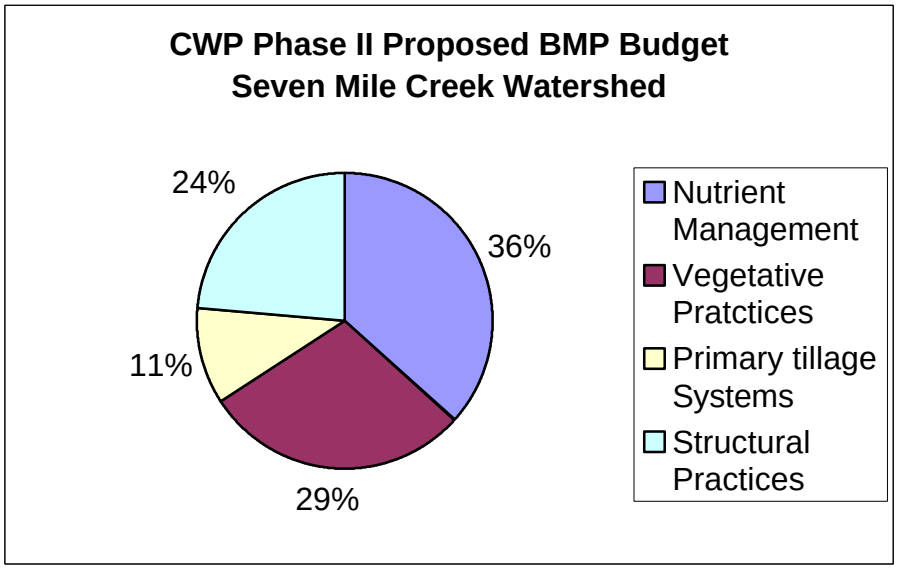


Figure 45. Proposed BMP budget for Seven Mile Creek.

Seven Mile Creek Watershed Project Milestone Schedule

Program Element	2002		2003		2004		2005
	March	Sept	March	Sept	March	Sept	March
1. Introductory Activities	x---------x						
Best Management Practices Activities							
2A. Nutrient Management	x----------x						
2B. Vegetative Practices	x----------x						
2C. Primary Tillage Systems	x----------x						
2D. Structural Practices	x----------x						
3. Monitoring	xxxxxxxx			xxxxxxxx		xxxxxxx	
4. Education & Outreach	x----------throughout project timeline----------x						
5. Data Management & Evaluation	x----------throughout project timeline----------x						
6. Administration	x----------throughout project timeline----------x						