Federal Fiscal Year 2000

Nonpoint Source Control Program Annual Report

South Dakota

November 2000

NPS Management Plan

EPA required all states to "upgrade" their nonpoint source management plans to address nine key federally mandated elements in order to access Section 319 "incremental" grant funds. South Dakota's revised plan was approved by EPA on March 30, 2000. This plan expands on earlier editions and continues to achieve improved water quality through voluntary actions developed in partnership with the land owners and land managers. Primary tools include technical and financial assistance as well as provision of better information and education. One of the keystones of this program is the Nonpoint Source Task Force composed of about sixty agencies, organizations and tribal representatives who coordinate diverse views and resources to make a workable program which benefits the landowners as well as the environment. The management plan is available upon request or can be accessed at the DENR website www.state.sd.us/denr/watershed.

The program has given high priority to solving water quality problems identified on the state's 303(d) list of impaired waters. Since the 303(d) list of impaired waters was expanded in 1998, considerable additional effort has gone into developing and implementing work plans to achieve TMDLs for all of the impaired waters over the next 13 years. The 303(d) list identified 171 impaired water bodies which needed TMDLs. As of September 30, 2000, 55 TMDLs had been completed and an additional 65 were in progress.

319 Projects Initiated

The following projects received 319 grant awards and were initiated during this reporting period:

STAFF & SUPPORT	**$ 227,303.00**
319 BASE GRANT	**$1,194,442.00**
Clear Lake Watershed Implementation	$ 623,354.00
Dakota Central Lake Assessment	$ 52,320.00
Jones/Rosehill Lakes Watershed Assessment	$ 74,370.00
Medicine Creek Watershed Assessment	$ 101,796.00
North Central Big Sioux/ East Oakwood Lake Watershed Assessment	$ 162,153.00
South Central Lakes Watershed Assessment	$ 113,663.00
White Lake Dam Assessment	$ 66,786.00

319 INCREMENTAL GRANT	**$1,814,455.00**
Blue Dog Lake Watershed Improvement Project	$ 375,000.00
Lake Faulkton Watershed Implementation Project	$ 673,710.00
Lakes Herman/Madison/Brant Implementation / Restoration	$ 765,745.00
TOTAL FY2000 319 GRANT	**$3,236,200.00**

Active 319 Projects

In addition to the above projects, the following projects are in progress:

Bad River Basin Projects	Bad River National Watershed Monitoring Bad River Phase III
Belle Fourche River Basin Projects	None
Big Sioux River Basin Projects	Bachelor Creek Assessment Blue Dog Lake Assessment Central Big Sioux TMDL Lake Poinsett Watershed Upper Big Sioux River Watershed
Cheyenne River Basin Projects	Lower Rapid Creek TMDL Rapid City Stormwater
Grand River Basin Projects	Grand River TMDL Shadehill Lake Protection Staffing & Support
James River Basin Projects	Cottonwood & Louise TMDL Firesteel Creek Implementation Lake Redfield Restoration Moccasin Creek TMDL
Minnesota River Basin Projects	Big Stone Lake/Little Minnesota Cochrane Oliver TMDL Lake Hendricks Watershed
Statewide / Regional Projects	Animal Waste Team (Buffer salesmen) Animal Waste Team III Bootstraps Ground Water Monitoring Network Nonpoint Source Information / Education 1994 Nonpoint Source Information / Education 1996 Statewide Lakes Assessment

319 Projects Closed

The following 319 projects have been closed:

Bad River Basin Projects	Bad River Phase II Upper Bad River Demonstration
Belle Fourche River Basin Projects	None
Big Sioux River Basin Projects	Big Sioux Well Head Protection Lake Campbell Watershed Restoration

	Lake Kampeska Watershed Pickerel Lake Protection Wall Lake
Cheyenne River Basin Projects	Foster Creek Riparian Demonstration - Stanley Co. Piedmont Valley Assessment
Grand River Basin Projects	None
James River Basin Projects	Lake Byron Watershed Clear Lake Assessment - Marshall Co. Foster Creek Riparian Demonstration - Beadle Co. Lake Mitchell Watershed Assessment Mina Lake Water Quality Ravine Lake Watershed Richmond Lake Watershed
Minnesota River Basin Projects	Big Stone Lake Big Stone Lake Restoration II Cochrane & Oliver TMDL Lake Cochrane Protection
Missouri River Basin Projects	Burke Lake
Vermillion River Basin Projects	Swan Lake Restoration
Statewide / Regional Projects	Abandoned Well Sealing Animal Waste Management I Animal Waste Management II Coordinated Resource Management I Coordinated Resource Management II East River Area Riparian Demonstration East River Riparian Demonstration II East River Riparian Grazing I Nitrogen & Pesticides in Ground Water Nonpoint Source Information & Education Nonpoint Source Information / Education 1989 Rainfall Simulator Riparian Grazing Workshop South Dakota Association of Conservation Districts South Dakota Lake Protection Statewide Lake Assessment

604(b) Projects Initiated

The following projects received 604(b) grant awards from DENR and were initiated during this reporting period:

PROJECT	CONTRACTUAL AWARD
Wylie Pond Assessment	$ 20,000.00

Active 604(b) Projects

PROJECT	CONTRACTUAL AWARD
Lake Alvin/Nine Mile Creek TMDL	$ 36,200.00
Bear Butte Creek TMDL Assessment	$ 15,500.00
Blue Dog Lake/Enemy Swim Septic Leachate Survey	$ 5,000.00
Lake Cochrane/Oliver TMDL	$ 20,500.00
Grand River Watershed TMDL	$ 28,785.00
Lakes Herman, Madison, Brandt Project Planning	$ 7,000.00
Moccasin Creek Watershed TMDL	$ 20,000.00

Closed 604(b) Projects

Bad River Basin	Bad River Phase IA Bad River Phase IB
Belle Fourche River Basin	Streambank Erosion Assessment-Upper Whitewood Creek Whitewood Creek Streambank Assessment Project Whitewood Creek Watershed Project Planning
Big Sioux River Basin	Big Sioux Aquifer Protection Project Big Sioux Aquifer Study Big Sioux River Bank Stabilization Demonstration Project Big Sioux River Riparian Assessment (Moody/Minnehaha) Pelican Lake Control Structure Feasibility Lake Poinsett Project Planning and Design Upper Big Sioux Watershed AGNPS
Cheyenne River Basin Projects	Develop NPS BMPs Western Pennington Co. Drainage Dist. Galena Fire Project Rapid Creek and Aquifer Assessment Project Rapid Creek NPS Assessment Project Rapid Creek Stormwater Impact Prioritization
Grand River Basin	None
James River Basin	Broadland Creek Watershed Study Firesteel Creek/Lake Mitchell WQ Needs Assessment - Landowner Survey Lake Faulkton Assessment Project Lake Louise Water Quality Monitoring Mina Lake Water Quality Project Ravine Lake Diagnostic/Feasibility Study Turtle Creek/Lake Redfield Landowner Survey
Minnesota River Basin	Fish Lake Water Level and Quality Study Lake Hendricks Restoration Assessment Lake Traverse/Little Minnesota River Land Inventory
Missouri River Basin	Burke Lake Diagnostic/Feasibility Study Lake Andes Watershed Treatment Project Platte Lake Planning

	Randall RC&D Implementation Planning

GRTS

South Dakota has entered 319 grants data into the EPA GRTS data base. This data base contains detailed information about 319 funded projects including funding, goals, tasks and status. For more information on accessing the GRTS system please contact DENR.

Staff & Support

During the reporting period, the Watershed Protection Program employed 15 full time equivalents including an office administrator, a secretary, ten environmental scientists, and three natural resources engineers and utilized portions of other department staff as needed. Some services were also provided under a consultant contract.

Goals of the staffing plan are to:

Provide sufficient administrative and financial support for the watershed/nonpoint source pollution control program to create and maintain functional, well-managed projects, and sustain an effective statewide program.

Develop and conduct watershed and site-specific assessments in priority areas for the preparation and implementation of TMDLs.

Provide sufficient technical support for the watershed/nonpoint source pollution control program to create and maintain effective projects using state-of-the-art science and engineering.

Provide staff to implement the information and education work plan and activities, and provide general information and education support to the program and project sponsors.

Facilitate partnering and coordination among agencies and project sponsors in the development and implementation of nonpoint source pollution control projects.

Detailed information about the program is available in the program staff & support work plan.

During this reporting period, in addition to maintaining the past level of service, the program participated with many groups and agencies in planning for increased activities under the Clean Water Action Plan. Staff routinely attended meetings of the South Dakota Association of Conservation Districts Board of Directors, SD Board of Water and Natural Resources, SD Conservation Commission, USDA Technical Committee, SD Nonpoint Source Task Force and local conservation districts which sponsored or were considering sponsoring nonpoint control projects. Staff also routinely met with agency staff from the US Army Corps of Engineers, US Forest Service, Environmental

Protection Agency, US Bureau of Reclamation, SD Department of Game, Fish and Parks, SD Department of Agriculture, and many other state and local governments and organizations including agricultural producer organizations.

Every active project listed in this report received staff assistance during this reporting period, often on at least a weekly basis. Staff initiated 17 contracts obligating $4,701,287.00 and processed 199 federal funds payment requests totaling $1,564,691.80. Staff also processed 34 state fund payment requests totaling $364,325.16.

Training

DENR nonpoint source program staff routinely train watershed project staff hired by local project sponsors. This is usually one-on-one training as needed particularly at the start of new assessment and implementation projects. During this reporting period, the North Dakota and South Dakota nonpoint source programs put on a two day joint conference for watershed coordinators from the two states. The conference addressed reports and record keeping, developing work plans and tracking progress, GIS techniques, soil health, riparian protection, monitoring and general grant management as well as new programs to enhance existing project resources. Coordinators were also given one afternoon to discuss their project needs with state staff.

Information and Education

Since the program's inception nearly 10 years ago, the South Dakota NPS I&E Program has developed and implemented its activities in partnership with stakeholder groups. It is the department's intent to continue its reliance on community based partnerships as a primary program delivery mechanism. This approach has lead to effective programming in the past and is consistent with the Clean Water Action Plan and South Dakota-EPA Performance Partnership Agreement. Based on identified local, state and national priorities, the South Dakota NPS Program Information and Education (I&E) priority issues are Animal Feeding Operation/Concentrated Animal Feeding Operation (AFO/CAFO) nutrient management related issues and TMDLs. A project summary is appended.

Other Resources

While funds provided through the Environmental Protection Agency play an important role in nonpoint source control in South Dakota, the program also takes advantage of resources from many other sources, public and private. The "South Dakota Nonpoint Source Program Manual" lists many of the available sources of resources. A few are summarized here.

Natural Resources Conservation Service

United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) program has

replaced the Great Plains Conservation Program - however, there are still 228 active Great Plains Contracts in South Dakota that funded $421,334 of conservation work in 2000.

EQIP Priority areas - There were nineteen priority areas funded in 2000 for $2,485,495. The break down for each priority area is as follows:

American Creek HU	$ 53,314
Bad River Watershed	$476,115
Bear Creek Watershed	$ 95,658
Belle Fourche River	$215,028
Clear Lake Restoration (Deuel Co.)	$ 6,270
Deep Creek Watershed	$103,492
Fall River Water Users	$ 97,216
Firesteel Creek	$133,251
Grand River Watershed	$216,227
Lake Faulkton Watershed	$126,104
Lower Little Minnesota River - Big Stone Lake	$ 64,691
Medicine Creek Drainage	$192,884
Medicine Root Watershed	$132,668
Northern Butte County Riparian Improvement	$ 99,936
Rousseau Creek Watershed	$ 65,077
Southwestern Little White River Watershed	$ 39,981
Standing Rock Reservation (includes Old Corson Lake Oahe)	$ 93,668
Upper Waubay Basin Watershed	$ 83,198
White River Watershed	$ 46,043

The EQIP statewide resource concerns for 2000 were funded at $1,026,209 and were broken down as follows:

Water Quality	$484,490
Highly Erodible Land	$ 79,457
Wildlife Habitat	$ 54,786
Grazing Land	$407,476

The small watershed program funded two PL-566 projects in South Dakota in 2000. The projects were the Lower Little Minnesota River - Big Stone Lake, land treatment project in northeast South Dakota and the Fall River Water Users rural water system in southwestern South Dakota. The land treatment project was funded at $157,200, and the rural water project was funded for $200,000 in 2000.

The NRCS level of technical assistance will remain consistent with that of the last few years. No major changes for staffing or funding are expected. Even though staffing levels will be maintained, technical assistance availability may be a problem. A workload analysis for 2001 indicates that 125 percent of the current NRCS staff is needed to complete mandated activities in South Dakota.

The Wetlands Reserve Program provided $3,000,000 in 2000 for both permanent and 30 year easements, which restored 5,756 acres of wetlands in South Dakota.

The Emergency Watershed Protection Program (EWP) floodplain easement has provided $1,800,000 for permanent protection on 6,478 acres of floodplains.

The Conservation Reserve Program (CRP) has 1,435,638 active acres in 2000. These lands are put into permanent vegetative cover, which is very effective in reducing erosion and improving water quality.

The Wildlife Habitat Incentives Program (WHIP) was not funded for new contracts in 2000. However, the NRCS in South Dakota was able to fund 7 contracts on 351 acres with funds that had been returned from existing contracts. The funding used for FY 2000 was $46,676.

US Forest Service

Public notices and other notices of proposed US Forest Service actions and permits were reviewed and coordinated as necessary. Special attention was paid to coordination of Environmental Assessment reviews for grazing permit issuance. Assistance was also provided to the Forest Service in assessing damage and in preparing prevention plans for potential water quality impacts in the aftermath of the Lookout Mountain and Jasper fires in the Black Hills.

SD Conservation Commission

The South Dakota Conservation Commission provides grants of state funds to conservation districts for implementation of Conservation Best Management Practices through their projects. In this reporting period, they awarded $784,034 of which $650,744 directly supported NPS projects.

319 Grant Match

Nonfederal match of 40% of project expenditures is required to match EPA 319 grants. All EPA 319 grants to South Dakota have been matched with significantly more state and local funds than required by federal regulations.

APPENDIX A

Initiated 319 Project Summaries

319 BASE GRANT

Clear Lake Watershed Implementation
Grant: 2000 Status: On Schedule Completion Date: 12/31/03
Description: Reduce phosphorus loading in the watershed using Best Management Practices. Using these practices, the goal is to reduce this load by 20 percent to meet the TMDL goal for the project. Due to the relationship between phosphorus and chlorophyll *a* reducing the amount of phosphorus in the watershed will also reduce chlorophyll *a* by 30 percent. The next goal is to reduce the amount of sediment entering the system. The reduction of sediment entering the system will be accomplished using Best Management Practices, such as no-till and grassed waterways. The goal is to reduce the nutrients of urban runoff into the watershed from the city storm sewer system. The urban run-off reduction will provide a margin of safety to ensure that the overall 20% reduction goal is met. The shallow nature of the lake allows phosphorus to be reused through the re-suspension of sediment and the uptake through aquatic macrophytes and algae, which can be a severe problem to recreation and fish habitats. Using weed harvesting and dredging together can improve water quality for recreation as well as fish habitats. The final goal is to update onsite wastewater septic systems of the city park and fairgrounds.

The Clear Lake watershed restoration project will target the reduction of nutrient and sediment loads in the tributaries and lake. This project will use and incorporate Best Management Practices for agricultural and urban runoff, Public Education and Information, Storm Sewer Outlet Modification, and Sediment Removal to improve fish habitat and reduce the quantity of sediment loads of phosphorus in the lake. The goal is to complete the project in four years.

The following is a list of activities that are planned for the watershed: Animal Waste Management System(s), Tree Planting, Grazing Management, Upland Habitat Improvements, Crop Rotation/Residue Management, Grassed Waterways, Alternate Watering Systems, Wetland Restoration, Riparian Bank Stabilization, Lake Shoreline Stabilization, Zero Phosphorus/Lawn Testing, Urban Sediment Trap and Sediment Removal, Information & Education, and Water Quality Monitoring.

Dakota Central Lakes Assessment
Grant: 2000 Status: On Schedule Completion Date: 3/31/01
Description: The long term goal of the Dakota Central Watershed Assessment Project is to locate and document sources of nonpoint source pollution in the watersheds and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project to improve sedimentation and nutrient problems with the Loyalton Dam and Cresbard Lakes watersheds. This project will result in TMDL reports for two 303(d) listed waters.

The north fork of Snake Creek is a natural stream that drains portions of Faulk County in South Dakota and is the outlet tributary to Cresbard Lake. The Snake Creek Watershed is approximately 21,373 acres above Cresbard Lake. The Dry Run Creek Watershed is approximately 6,419 acres above Loyalton Dam. The creeks receive runoff from agricultural operations and both the creeks and lakes have experienced declining water quality. The watersheds have predominately agricultural land use with cropland and grazing.

This project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring, stream gaging, stream channel analysis and land use analysis.

Jones Lake/Rosehill Lakes Watershed Assessment
Grant: 2000 Status: On Schedule Completion Date: 6/30/01
Description: The long term goal of the Jones Lake. Rosehill Lake Watershed Assessment project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project to improve sedimentation and nutrient problems with the creeks and lakes as well as creating a Total Maximum Daily Load (TMDL) report for each of the water bodies.

Turtle Creek is a natural stream that drains a portion of Hand County in South Dakota and is the main tributary to Jones Lake in Hand County. Sand Creek is a natural stream that also drains a portion of Hand County and is the primary tributary to Rosehill Lake in Hand County. The creeks receive runoff from agricultural operations and both the creeks and lakes have experienced declining water quality. The Turtle Creek watershed is approximately 25, 125 acres (9605 hectares) above Jones Lake. The Sand Creek Watershed is approximately 23,734 acres (hectares) above Rosehill Lake. Both watersheds are predominately agricultural in land use with grazing and cropland.

Medicine Creek Watershed Assessment
Grant: 2000 Status: On Schedule Completion Date: 6/30/01
Description: The long term goal of the Medicine Creek Watershed Assessment Project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project to improve sedimentation and nutrient problems with the creeks and lakes in the watershed. This project will result in TMDL reports for two 303(d) listed waters.

Medicine Creek is a natural stream that drains portions of Lyman and Jones counties in South Dakota and is the outlet tributary to Brakke Dam and Fate Dam in Lyman County. The creek receives runoff from agricultural operations and both the creek and lakes have experienced declining water quality. The Medicine Creek Watershed is approximately 437,892 acres with 14,435 acres above Brakke Dam and 16,957 acres above Fate Dam. The watershed is predominately agricultural land use with cropland and grazing.

The project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in the final project report.

A concurrent water quality assessment is being administered by the Lower Brule Sioux Tribe on tribal land.

North Central Big Sioux River/ East Oakwood Lake Watershed Assessment
Grant: 2000 Status: On Schedule Completion Date: 3/28/03
Description: The long term goal of the North-Central Big Sioux River/East Oakwood Lake Watershed Assessment Project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project (or projects) to improve water quality problems within the watershed. Completion of the study will result in one or more Total Maximum Daily Load (TMDL) reports for a portion of the Big Sioux River (BSR) and its tributaries and a TMDL report for East Oakwood Lake.

The Big Sioux River is a permanent, natural river that flows north to south along the eastern edge of South Dakota. The segment of the watershed to be examined in this project studied extends from roughly the river's confluence with Willow Creek (near Watertown) south to the confluence with North Deer Creek around Brookings. The river and tributaries, including East Oakwood Lake, drains portions of Codington, Deuel, Hamlin and Brookings counties. The North-Central BSR watershed encompasses approximately 480,000 acres of predominately agricultural land, with some municipal development around the communities of Watertown and Brookings. This project is intended to be the initial phase of a watershed-wide restoration project. Through water quality monitoring (chemical and biological), stream gaging and land use analysis, sources of impairment to the river and the lake system within the watershed will be documented and feasible alternatives for restoration will be presented in the final project/TMDL reports.

South Central Lakes Watershed Assessment
Grant: 2000 Status: On Schedule Completion Date: 12/31/01
Description: The long term goal of the South Central Watershed Assessment Project is to locate and document sources of nonpoint source pollution in the watersheds and produce feasible restoration alternatives in order to provide adequate background information needed to drive watershed implementation projects to improve sedimentation and nutrient problems with the creeks and lakes. This project will result in TMDL reports for six 303(d) listed waters.

The South Central Water Development District (SCWDD) is a special purpose water district bordered on the west by the Missouri River. Included in the boundaries of the SCWDD are several small lakes and reservoirs which are included in the South Dakota

303(d) list of impaired waters. The purpose of this project is to assess 6 small lakes and reservoirs and their watershed in the SCWDD area. The waters to be assessed include Geddes Lake, Lake Andes, Dante Lake, Academy Lake and Platte Lake in Charles Mix County and Corsica Lake in Douglas County. The watershed sizes for these lakes range from 2,844 acres for Dante Lake to 348,384 acres for the watershed of Lake Platte. This total project will be a two year effort. All of the watersheds for the lakes are primarily agricultural land use with croplands, grazing lands and livestock feeding areas.

This project is intended to be the initial phase of a series of watershed wide restoration projects. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the streams and the watershed will be documented and feasible alternatives for restoration will be presented in the final project reports. Each lake will have an individual final project and TMDL report.

White Lake Dam Assessment
Grant: 2000 Status: On Schedule Completion Date: 3/31/01
Description: The long term goal of the White Lake Dam assessment project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project to improve sedimentation and nutrient problems with the creeks and lakes in the watershed and to produce a TMDL report for the waterbody.

White Lake Dam is a small reservoir in northwest Marshall County, South Dakota. The reservoir receives runoff from agricultural operations and both the creeks in the watershed and the lake have experienced declining water quality. The White Lake Dam watershed is approximately 22,348 acres is size. The watershed is predominately agricultural land use with cropland and grazing.

This project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in the final project report.

319 INCREMENTAL GRANT

Blue Dog Lake Watershed Improvement Project
Grant: 2000 Status: On Schedule Completion Date: 12/31/03
Description: The major goal of the Blue Dog Lake restoration project is to reduce in-lake phosphorus by 35%. According to the Blue Dog Lake Watershed Assessment / TMDL, Blue Dog in-lake phosphorus Trophic Status was found to be hypereutrophic. By reducing the in-lake phosphorus concentrations by 35%, the trophic Status Index of in-lake phosphorus will be moved from its current hypereutrophic TSI of 67.55 to eutrophic TSI of 60.18.

The Blue Dog Watershed Improvement Project is a volunteer effort sponsored by the Day Conservation District. The conservation district will work with the local landowners to implement conservation practices that eliminate or reduce the phosphorus exports off targeted land areas. The targeted areas will be chosen from a completed land use model (AGNPS) that was part of the watershed assessment/TMDL. Practices to be implemented may include, but not be limited to: animal waste management systems, clean water diversions, nutrient management plans, range management plans, stream crossings, riparian restoration, reduced tillage practices, and permanent grass seeding.

Blue Dog Lake is located in northeastern Day County, South Dakota, north and adjacent to Waubay, SD. This lake is currently on the South Dakota Section 319 Priority Water Body List. Blue Dog Lake is used primarily for boating (skiing), fishing, and swimming.

Blue Dog Lake is classified with the beneficial uses of:
(4) Warmwater permanent fish life propagation;
(7) Immersion recreation;
(8) Limited contact recreation
(9) Wildlife propagation and stock watering.

A two year watershed assessment of Blue Dog Lake was completed in 1998. Blue Dog Lake is classified as hypereutrophic, impaired by shallow depth as a result of watershed and shoreline sedimentation.

The average TSI in Blue Dog Lake at the time of the watershed assessment was hypereutrophic. Secchi depth and total phosphorus concentrations are hypereutrophic while chlorophyll *a* concentrations were eutrophic. The re-suspended sediments appear to slightly lessen the TSI values of chlorophyll *a*. Wind and wave action appear to increase the total phosphorus concentrations by stirring up bottom sediments. Nitrate and ammonia concentrations in Blue Dog Lake are not inordinate for a prairie lake, but are assisting in algae production.

Fecal coliform bacteria were found on occasion in mid-lake samples. Because the lake has a central sewer collection system. Fecal coliform bacteria most likely came from the watershed/tributaries.

Lake Faulkton Watershed Implementation
Grant: 2000 Status: On Schedule Completion Date: 3/31/2006
Description: The major goals of the Lake Faulkton Watershed Project are to improve the quality of water in Lake Faulkton and in the Lake Faulkton Watershed through the reduction of phosphorus loading into the lake by thirty-five percent and through the removal of 150,000 cubic yards of sediment from the lake. This project will implement these goals which were developed in the South Dakota Department of Environment and Natural Resources Total Maximum Daily Load (TMDL). Other goals include maintaining improved water quality and the lake's beneficial uses of semipermanent marginal fish life propagation, immersion and limited-contact recreation, wildlife propagation and stock watering.

The Lake Faulkton Watershed Project in a six year project that will begin the long-term effort needed to reduce nutrient and sediment loadings. Best Management Practices will be installed in the watershed to reduce contaminant loadings, and to demonstrate the BMPs abilities to reduce pollution and their cost effectiveness. Major practices will include the development of agricultural waste systems, riparian and buffer zones, and planned grazing systems. These practices will be targeted towards nutrient sources, buffering nutrients from entering the water, and reducing sediment yield carrying nutrients. The project will provide information to land users and the community on methods to reduce pollution in the watershed. Water quality monitoring will be completed to document water conditions and to evaluate reductions in loadings from the installation of BMPs.

Lakes Herman/Madison/Brant Implementation/Restoration
Grant: 2000 Status: On Schedule Completion Date: 06/30/03
Description: The overall goal of the restoration effort is to decrease the phosphorus loading of Lake Herman/Brant Lake by 50 percent in compliance with the TMDL. Agriculture and the city of Madison's stormwater sewer presently are the largest contributors of the phosphorus entering the lakes. The following project objectives and tasks were established: (1) construct 10 AWMS; (2) implement 16 alternative animal waste treatment BMPs; (3) install 28 terrace & contour buffer strips; (4) construct 6 multi-purpose dams; (5) stabilize 2087 feet of stream bank; (6) construct 22 grass waterways; (7) develop a storm sewer remediation plan; (8) implement an information and education program; (9) implement a program to address the failing septic systems in the Lake Herman Sanitary District.

Lake Herman/Lake Madison/Brant Lake are hypereutrophic lakes subject to excessive nutrient loading. The loading stimulates algal blooms and aquatic plant growth limiting the beneficial use of the lakes. Best management practices will be installed in the watershed to reduce nutrient loading. A remediation plan for the city of Madison's storm sewer will be developed to reduce pollution. An information and education program will be implemented. Water quality monitors will be installed to document water quality conditions and evaluate reductions in nutrient levels.

Active 319 Project Summaries

Bad River Basin

Bad River National Watershed Monitoring
Grant: 1996 Status: Completed* Completion Date: 12/31/00
Description: All monitoring sites have been installed and active for three years. BMPs were implemented this year. This project is being combined with the Bad River Phase III project and is expected to continue until 12/31/05.

Bad River Phase III
Grant: 1999 Status: On Schedule Completion Date: 12/30/01

Description: This is a three year continuation of the water quality project for the Lower Bad River. Better than planned landowner response has resulted in all available funds being spent or obligated. The Bad River Phase III Amended Water Quality Project is a multi-faceted implementation effort designed to control sources of non-point pollution (predominately sediment) from the Bad River tributaries and Antelope Creek in Stanley County, South Dakota with emphasis on riparian re-vegetation and improved grazing management. The project is a complete project encompassing approximately 584,000 acres that lies within Stanley County.

Three studies of the Bad River have been conducted to determine the major sources of sedimentation. The Bad River Phase I and 1B Water Quality Project was conducted by the Stanley County Conservation District and North Central RC & D under an EPA 319 Grant. The Lower and Upper Bad River Basin Studies were conducted by the Natural Resources Conservation Service.

The Phase 1 study determined that the majority of the Bad River sediment was coming from the lower one-third of the watershed and was coming primarily from the steep fragile clay rangeland. The River Basin study determined that the major sedimentation coming from the rangeland was resulting form gully erosion and channel scouting that results from accelerated water flows coming off cropland and rangeland in the lower one-third of the watershed.

As a result of the Phase 1 project, the Bad River Phase II Water Quality Project was developed. It was targeted to treating the Plum Creek watershed in Stanley County and using Willow Creek watershed as a control site. Storm events in the county vary greatly in intensity within a very few miles. As a result of this variation, the Willow Creek control site was abandoned in favor of rainfall simulation.

Best Management Practices (BMPs) were applied in Plum Creek watershed under Phase II to reduce erosion. Sedimentation data collected by USGS at the mouth of Plum Creek indicated that Plum Creek's contribution of sediment delivered to the Bad River changed from 82.7 tons per acre-foot of runoff to 10.2 tons per acre-foot of runoff as a result of BMP installation.

The Bad River Phase III Project applies those practices that have been found socially acceptable and economically feasible in the Phase II Project along with those practices that addressed resolution of the problem identified by the previously mentioned studies. Phase III emphasis is placed on:

1) Increasing infiltration rates on cropland and rangeland
2) Reducing stream flow rates
3) Constructing structures to reduce and trap sediment

Bad River Phase III

Grant: 1997 Status: Completed* Completion Date: 8/14/99

Description: Stanley County Conservation District is requesting additional financing for expansion of the Bad River Phase III project. The Antelope Creek Watershed which

abuts the Bad River Watershed and drains directly into Lake Sharpe Reservoir in eastern Stanley County has been added to the original plan. The watershed consists of an additional 40,000 acres of rangeland and cropland. Requests by landowners for participation in the original project have exceeded the original estimates. Landowners in the added watershed have also demonstrated great interest in developing plans.

In addition to the preceding needs, the area received severe windstorms this early spring that created major wind erosion problems on the cropland within the project area,. It is imperative that increased emphasis be placed on the reduction of cropland wind erosion through crop residue management and other accepted control practices such as stripcropping or reseeding to native vegetation. The wind erosion problems were not targeted in the original workplan because two previous studies of the sources of sediment indicated the major problems were coming from the rangeland rather than the cropland.

* The project is continued as the Bad River Phase III under the 1998 grant.

Belle Fourche River Basin

None

Big Sioux River Basin

Bachelor Creek Assessment

Grant: 1998 Status: Completed Completion Date: 12/31/00

Description: Bachelor Creek drains an agricultural watershed and is subject top nonpoint source pollutant loading, riparian modification and channel aggradation/degradation. Rigorous assessment data are not available to accurately define water quality problems within the watershed. However, several perceived problems have been noted within the Bachelor Creek Hydrologic Unit Plan (Moody County Conservation District 1991). These problems include agricultural fertilizer and pesticide contamination, water erosion and sedimentation, feedlot runoff, municipal sewage contamination, creek litter accumulation and flooding Seventy four percent of respondents indicated that agricultural chemical overuse was a problem within the watershed. Water erosion, feedlot runoff and municipal sewage were considered significant problems by over 40% of respondents. Creek litter and flood control were considered significant problems by over 30% of respondents.

The principal goal of this assessment project is to improve the water quality within the Bachelor Creek watershed. This goal will be achieved by (1) defining the current ecological integrity of water resources within the Bachelor Creek Watershed, (2) identifying nonpoint source critical areas within the Bachelor Creek watershed and (3) developing management prescriptions for the restoration of best attainable water quality.

Blue Dog Lake Assessment

Grant: 1996 Status: Completed Completion Date: 10/1/98

Description: The immediate goal of the project is to target areas in the two watersheds that are contributing erosion and nutrients to Blue Dog and Enemy Swim Lake. By targeting these areas, conservation resource managers will be able to put the most cost

effective Best Management Practices (BMPs) to use in the watersheds. The long term goals of the study and future implementation project are to improve the water quality of the lake through sediment and nutrient control and increase beneficial uses. The Blue Dog/Enemy Swim targeting project is the first step of a multifaceted project. The first years of the project will identify specific areas in the watersheds that need sediment and nutrient management and the costs of those practices. The targeting will be accomplished by monitoring the water quality of the major drainages in the watersheds. The AGNPS model will be used in conjunction with the water quality monitoring to target specific areas that may be causing excessive nutrient and sediment loading to the lakes. The land use model will determine problem areas and the most cost effective BMPs that should be implemented in the watersheds. The monitoring information will be used to verify the AGNPS model and estimate the decrease of nutrient and sediment loading if BMPs are implemented in the watershed.

Central Big Sioux TMDL
Grant: 1999 Status: On Schedule Completion Date: 12/31/02
Description: The long term goal of the Central Big Sioux River Watershed Assessment project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project (or projects) to improve water quality problems within the watershed. Completion of the study will result in a Total Daily Maximum Load (TMDL) report for the portion of the Big Sioux River (BSR) and its tributaries included in the project.

The Big Sioux River is a permanent, natural river that flows north to south along the eastern edge of South Dakota. The segment of the watershed to be examined in this project extends from roughly the river's confluence with North Deer Creek (near Volga) south to the Iowa border near Brandon. The river and tributaries drain much of Brookings, Lake, Moody and Minnehaha counties, as well as a portion of southwestern Minnesota. The Central BSR watershed encompasses 1,282,560 acres (519,255 hectares) of predominantly agricultural land, with significant municipal development in/around the communities of Brookings and Sioux Falls.

This project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring (chemical and biological), stream gaging and land use analysis, sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in the final project/TMDL report.

Lake Poinsett Restoration
Grant: 1999 Status: On Schedule Completion Date: 12/31/06
Description: Lake Poinsett is a 7,868 acre glacial lake. It is one of the largest natural lakes in South Dakota. The major tributaries are the Boswell Diversion from the Big Sioux River, (the outlet from the Big Sioux River during flood water stage), and the outlet from Lake Albert. Lake Poinsett has a maximum depth of 19.5 feet and mean depth of 9.5 feet. The lake has an estimated volume of 74,746 acre-feet. North of Lake Poinsett is a 1,920 acre surface portion of the Lake Poinsett Basin named Dry Lake. A

dike/road separates the two at Stone Bridge. The combined surface area of the two water bodies is 9,828.6 acres.

Several water quality and physical characteristics studies have been conducted on Lake Poinsett, the most recent being a Diagnostic/Feasibility (DF) Study (lake assessment) completed during January, 1996. The main pollutants identified during these studies include phosphorous, nitrogen, and sediment. Based on a comparison to other watersheds in Eastern South Dakota, the sediment and nutrient loadings to Lake Poinsett appear low. However, when a subwatershed analysis was performed, above normal sediment loadings were found in Lake Albert and Dry Lake, and high nutrient loadings in the Lake Albert and Dry Lake subwatersheds. The implementation of Best Management Practices (BMPs) targeted to critical cells within the Lake Albert and Dry Lake subwatersheds and feedlots should produce the most effective treatment plan in reducing sediment and nutrient loadings to Lake Poinsett.

The goal for Lake Poinsett Restoration Project is to fully restore the lake to all its designated uses. The initial EPA grant award of $213,152 was for best management practices that would reduce nutrient and sediment loading by approximately 20 percent. The current application is to complete the activities recommended by the lake assessment study and further reduce nutrient and sediment loading by an additional 30 to 35 percent.

Efforts will continue to promote an expansion of the centralized sanitary sewer system around Lake Poinsett. On-site septic systems are a direct input of phosphorus to the lake that can be immediately reduced. However, until this is attained, on-site septic systems will be examined to determine their condition. Upgrading or improving failing septic systems will aid in the reduction of phosphorus loading.

In order to achieve the goal over the eight year time frame, the following measures will be implemented:

1. Integrated Crop Management on 6,000 acres
2. Grazing Management by 30 miles of cross-fencing and rotational grazing
3. Install 6 large Animal Waste Management Systems and 14 smaller systems
4. Stabilize 4,000 ft of shoreline
5. Install one additional Riparian Demonstration Site
6. Crop Residue Management on 12,000 acres over 6 years
7. Secure 45,000 ft of grassed waterways
8. Construct 50 small dams or ponds in the watershed
9. Install two additional alternative livestock watering sites
10. Restore 80 acres of wetlands
11. Develop a public relations program consisting of brochures, public meetings, public tours, media project updates and project progress signs.

Lake Poinsett Watershed
Grant: 1998 Status: On Schedule Completion Date: 12/31/00
Description: The Lake Poinsett Watershed project is a two-year project designed to reduce the nutrient and sediment loads entering the lake and implement a pollution

prevention program. Nutrient loads form the lake shore will be reduced through voluntary restriction of phosphorous-based fertilizers. Reduction of nutrient loads from the watershed will be accomplished through integrated crop management, grazing management, and installation of ag waste systems. Sediment loads from the watershed will be reduced by riparian area repair, crop residue management, grass waterways, filterstrips, small ponds / dams, and wetland restoration. A program will be developed to inform the public about water quality and watershed best management practices.

Lake Poinsett is a 7,868 acre glacial lake. It is one of the largest natural lakes in South Dakota. The major tributaries are the Boswell Diversion from the Big Sioux River, the outlet from the Big Sioux River (during flood water stage), and the outlet from Lake Albert. Lake Poinsett has a maximum depth of 19.5 feet and a mean depth of 9.5 feet. The lake has an estimated volume of 74,746 acre-feet. North of Lake Poinsett is a 1,960 acre surface portion of the lake Poinsett Basin named Dry Lake. A dike / road separates the two at Stone Bridge. The combined surface area of the two water bodies is 9,828.6 acres.

Several water quality and physical characteristic studies have been conducted on Lake Poinsett, the most recent being a Diagnostic / Feasibility Study (DFS) completed during January 1996. The main pollutants identified during these studies include phosphorous, nitrogen, and sediment. Based on a comparison to other watersheds in eastern South Dakota, the sediment and nutrient loadings to Lake Poinsett appear low. However, when a subwatershed analysis was performed, above normal sediment loadings were found in Lake Albert and Dry Lake, and high nutrient loadings in the Lake Albert and Dry Lake sub watershed. The implementation of BMPs targeted to critical watershed cells within the Lake Albert and Dry Lake sub watersheds and feedlots should produce the most effective treatment plan in reducing sediment and nutrient loading to Lake Poinsett.

Upper Big Sioux River Watershed
Grant: 1997 Status: On Schedule Completion Date: 12/31/99
Description: The Big Sioux River is one of five major river basins in South Dakota that drains into the Missouri River. It is composed almost entirely of deep loess soils over glacial till and outwash. The fertile soils are primarily used for cropland, although one-fourth of the land remains in pasture and hay production. The Big Sioux River forms the border between South Dakota and Iowa and flows into the Missouri River three miles upstream from Sioux City, Iowa.

The river basin study will identify and quantify areas needing treatment for sediment and nutrient reduction and water quality improvement in the upper portion of the drainage area. The AGNPS model will be used to identify and quantify areas needing treatment. Alternatives will be developed to help sponsors set priorities for implementation of nonpoint pollution management activities.

The sediment and nutrient loads from the Upper Big Sioux River have impaired the water quality in both Lake Kampeska and Pelican lake. DENR has determined through monitoring that both lakes have become hypereutrophic as a result of these loadings.

This is of great concern because it restricts the beneficial uses of the lakes. Each lake has similar uses for recreation and wildlife; however, Lake Kampeska is also used as a domestic water supply for the city of Watertown. In recent years, the City has obtained 36 to 45 percent of its drinking water from Lake Kampeska. Water use from the lake for drinking water has been shut down during the summer months three of the last fife years due to taste and odor. A continued decline in water quality will force the city to rely on ground water wells. The installation of additional wells to replace the surface water supplies would result in a negative economic impact.

Cheyenne River Basin

Lower Rapid Creek TMDL

Grant: 1999 Status: On Schedule Completion Date: 5/01/01

Description: The proposed study area (328 mi2) is subject to urban stormwater runoff, irrigation withdrawals and return flows, wastewater treatment plant discharge, and runoff from agricultural areas. The 1998 South Dakota 303(d) Waterbody List identified the portion of this reach associated with the Rapid City wastewater treatment plant discharge as a 1998-2000 Biennium TMDL waterbody. Additionally, the reach below the treatment plant is listed under impairment-related TMDL waters. To develop a realistic TMDL for lower Rapid Creek the project must take on a watershed assessment approach recognizing the information needed for TMDL development. To be approved each TMDL must include seven components: 1) target identification, 2) identification of current deviation from target, 3) source identification, 4) allocation of pollutant loads, 5) implementation plan, 6) process for follow-up monitoring and assessment of effectiveness, and 7) process for TMDL revision (EPA, 1998). This project proposes to complete the first four components and provide recommendations for the implementation plan.

The primary goal of this project is to conduct a watershed assessment along lower Rapid Creek that will characterize point and nonpoint sources of pollution, providing information for identification and evaluation of watershed management alternatives and development of the TMDL for lower Rapid Creek.

To develop a realistic TMDL for lower Rapid Creek the project must take on a watershed assessment approach recognizing the information needed for TMDL development. The project objectives and tasks presented in the following section integrate the necessary components for a TMDL which include: 1) target identification, 2) identification of current deviation from target, 3) source identification, and 4) allocation of pollutant loads. Additionally, this assessment will provide recommendations for the implementation plan.

Rapid City Stormwater – Wonderland Homes

Grant: 1999 Status: On Schedule Completion Date: 5/1/02

Description: The primary goal of this project is to reduce pollutant loadings to Rapid Creek from urban stormwater runoff produced within Wonderland drainage basin. Reduction of sediments and associated pollutants will provide protection of existing beneficial uses. Presently, drainage basin design plans developed for Rapid City watersheds are designed to ensure adequate conveyance of runoff. One objective is to

integrate control of stormwater quality into the existing drainage design plans. Sediment control structures and vegetation-lined channels are two primary features used to convey stormwater runoff. In addition to structural controls, Low-Impact Development methods will be used. Low-impact development methods are cutting-edge, tested ideas which place the burden of stormwater management onto the developer. By providing the developer and the homeowner cost effective, simple techniques, stormwater is significantly reduced at an individual property in quantity and in pollution downstream.

Evaluation of the Wonderland watershed and land use shows that a single control structure at the outlet of the watershed would not be feasible. The proposed approach is to locate three structures along the basin, each controlling the "first flush" from approximately 1/3 of the basin. Flows exceeding the first flush will bypass the structures. The proposed structures will be linked with vegetated channels that prevent channel erosion and promote sediment removal during frequent events. The first of these structures is currently being designed by the City of Rapid City and is located near the outlet. This project will integrate the capacity of the downstream structure for locating the next upstream structure which is proposed for this project.

Grand River Basin

Grand River TMDL

Grant: 1999 Status: On Schedule Completion Date: 5/1/01

Description: The purpose of this Pre-Implementation Assessment is to determine the sources of impairment to Shadehill Reservoir, the North and South Forks of the Grand River in Perkins and Harding Counties, South Dakota, and the un-named tributaries in the watershed. The watershed ultimately drains to the Missouri River. The small tributaries in the watershed are intermittent streams with loadings of sediment and nutrients related to snowmelt or rainfall events.

Shadehill Reservoir is a 4,693 acre (1,899 ha) impoundment on the confluence of the North and South Forks of the Grand River. The reservoir has experienced a buildup of sediment.

The surface watershed area for Shadehill Reservoir is approximately 1,996,800 acres (808,105 hectares) in size. The city of Buffalo (population 488) is the largest municipality located in the watershed. The only other community in the watershed is Bison (population 451). The estimated total population within a 65-mile radius of Shadehill Reservoir is 24,047.

Land use in the watershed is primarily agricultural. Approximately 25 percent of the landuse is cropland and 75 percent grass or pasture. Wheat and alfalfa are the main crops. Only a few animal feeding operations are located in the watershed. Grazing is the largest landuse in the Grand River Watershed. Livestock and livestock products are the main source of income, but income from cash crops is also important.

The average annual precipitation in the watershed is 16 inches of which 76% usually falls in April through September. Thunderstorms occur on about 29 days each year, and most

occur in summer. Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration and occasionally produce heavy rain fall events. The average seasonal snowfall is 30 inches per year.

The landscape in the watershed is characterized as an upland plain that is moderately dissected by streams and entrenched drainageways. Land elevation ranges from about 3,800 feet msl in the west and north parts of the watershed to about 2,600 msl in the eastern part.

The purpose of this assessment is to develop land treatment alternatives for the Shadehill Watershed on the North and South Forks of the Grand River and serve as the foundation of a Section 319 implementation project.

Shadehill Lake Staffing & Support
Grant: 1998 Status: Completed Completion Date: 9/22/00
Description: This project is an effort to support in 1998 EQIP Priority Area efforts in the Shadehill Lake Watershed. The project area includes the entire South Grand River hydrologic unit and the North Grand River hydrologic unit to the North Dakota state line. Plans are to continue the GRWEQIPPA four more years through 2001. In 1999 the PCCD plans to work with the HCCD, DENR, SCC, DRCF and NRCS to implement a Shadehill Lake Watershed Assessment in order to inventory and prioritize natural resource conservation needs. The assessment will be followed in the year 2000 by a Shadehill Lake Protection Project Phase II. In Phase II the PCCD will partner with the HCCD, DENR, SCC, DRCF and NRCS to further Bootstraps group conservation efforts and will focus planning and application of BMPs in areas of the watershed with the greatest needs. All of the above amounts to a sustained effort which will result in improved wildlife habitat including fisheries, increase quality and quantity of livestock forage and grazing and improve recreation for area residents.

The primary pollutants that threaten Shadehill Lake are sediment and nutrients. the sources of these pollutants are the moderately/highly erosive soils in the watershed which can erode extensively through poor agricultural and grazing practices. pollutant delivery occurs primarily during the spring snow melt and during storm events. Low flows are common in these tributaries which partially contributes to poor water quality.

James River Basin

Cottonwood & Louise TMDL
Grant: 1999 Status: On Schedule Completion Date: 5/1/01
Description: The purpose of this Pre-Implementation Assessment is to determine the sources of impairments to Lake Louise and Cottonwood Lake in Hand, Hyde, Spink and Faulk Counties, South Dakota, and the tributaries in their watersheds. The watersheds ultimately drain to the James River. The creeks and small tributaries are streams with loadings of sediment, nutrients and metals related to snowmelt or rainfall events.

Wolf Creek is a natural stream that drains portions of Hyde and Hand Counties in South Dakota and is the main tributary to Lake Louise in Hand County. Medicine Creek is a

natural stream that originates in Faulk County, runs through the northeast part of Hand County and drains into Cottonwood Lake in Spink County. The creeks receive runoff from agricultural operations and both the creeks and lakes have experienced declining water quality. The Wolf Creek watershed is approximately 104,694 acres (42,370 hectares) above Lake Louise. The Medicine Creek Watershed is approximately 151,501 acres (61,312 hectares) above Cottonwood Lake. Both watersheds are predominately agricultural land use with grazing and cropland.

This project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in the final project report.

Firesteel Creek Implementation
Grant: 1999 Status: On Schedule Completion Date: 1/31/06
Description: The Firesteel Creek Watershed is located in the south-central South Dakota counties of Davison, Aurora, and Jerauld. Firesteel Creek is a 350,960 acre watershed that is 54 miles in length with its' headwaters north of Wessington Springs and its entrance to the James River one mile southeast of Mitchell. Lake Mitchell (671 surface acres) is located on Firesteel Creek three miles upstream from the Creeks' entrance into the James River. Lake Mitchell is the drinking water source for the City of Mitchell and rural Davison County. Lake Wilmarth, located on the western branch of Firesteel Creek is also an important watershed lake. Additionally, Lake Mitchell and Firesteel Creek watershed provide significant economic and social value through its recreation, wildlife habitat, esthetics, residential living, and historic and cultural features. Approximately 500,000 annual tourists/visitors travel to enjoy the Mitchell and Lake Mitchell attractions. The Prehistoric Indian Village, Municipal golf course, camp ground, public beach, and 33 public access areas are on the shoreline of Lake Mitchell.

Since the early 1970's area residents have expressed concerns about the water quality in Firesteel Creek and Lake Mitchell. The primary public concerns have been taste and odor problems and excessive algae blooms. The community and city of Mitchell have explored alternative sources of water and have concluded that Lake Mitchell will remain their primary and sole source into the future. The Phase I study (DFS) initiated in 1993 was undertaken and completed with a commitment to do an accurate assessment that would allow successful action to reduce water quality problems.

The final report on the Phase I assessment. dated March 1997, concluded that nutrient loading to Lake Mitchell is high and sediment loading is low compared to other lakes in Eastern South Dakota. The main source of nutrients is from concentrated animal feeding areas and/or intense summer long grazing. Overall, the total nutrient loading to Lake Mitchell is 0.0005 ton/acre/year for nitrogen and 0.00017 ton/acre/year for phosphorus. This is equivalent to a 25 year event loading of 156.1 tons of nitrogen and 60.4 tons of phosphorus to Lake Mitchell.

The overall sediment loadings to Lake Mitchell are estimated at 0.1137 tons/acre/year. The sediment deposition estimate is equivalent to 0.44 inches/year or 1 foot of lost depth every 61 years assuming 100% retention of sediment by the lake. From the water quality and quantity data collected, Firesteel Creek is responsible for the following percentages of loading to Lake Mitchell:

78% of the water (groundwater = 14%, storm sewers = 4%, rain & other tribs = 4%)
93% of the total phosphorus
91% of the suspended solids
84% of the total nitrogen

The major source of nutrients that seem to be the cause of eutrophication in Lake Mitchell, are from concentrated animal feeding areas and/or intense summer long grazing. The AGNPS modeling identified 37 feeding areas estimated to be the source of 37% of the inlake loading and an additional 79 feeding areas the source of 14% of the phosphorus. Nutrient and sediment loadings related to summer long grazing along the creek are difficult to quantify. Storm sewers were rated second ass a source of nutrient and sediment loading with estimates of 4% for phosphorus, 8% for nitrogen, and 8% for total suspended solids. Reduction of phosphorus loading into Lake Mitchell by 50% is estimated to change chlorophyll *a* concentrations to a minimum Carlson TSI rating of 52, which is close to mesotrophic. This reduced level of chlorophyll a concentrations will decrease the amount of organic matter (reduce algae blooms) which will enter the water treatment plant and should reduce the taste and odor problems as well as provide the needed water clarity and quality for the other critical lake uses, (recreation, historic, etc.).

A partnership of local governments, agriculture, city and lakeshore owners have set long-term goals to return Lake Mitchell to near a mesotrophic status by 2015. This partnership has developed their goals based on the assessments completed and it shows their recognition of the long-term effort needed to restore water quality. This project proposal is a phase of the long-term effort and a part of many diverse efforts that will be undertaken to meet the year 2015 goal.

Lake Mitchell Watershed Implementation
Grant: 1998 Status: On Schedule Completion Date: 12/31/98
Description: See Firesteel Creek

Lake Redfield Restoration
Grant: 1997 Status: Completed Completion Date: 8/1/00
Description: See project status update information for project summary and task level information with the 1996 Turtle Creek/Redfield Lake project. The 97 grant funded the project at the full funding level requested on the 1996 319 application (requested $449,090, 1996 - $159,379, 1997 - $289,711). This project was partially funded out of the 319 fy96 grant and fully funded with additional funds form the 319 FY97 grant.

Moccasin Creek TMDL
Grant: 1999 Status: On Schedule Completion Date: 5/1/02

Description: Moccasin Creek is an ephemeral, natural stream that drains a portion of Brown County, South Dakota. The creek receives storm sewer discharges from the city of Aberdeen, South Dakota and has experienced a loss of capacity. Excessive sedimentation has resulted in frequent flooding in the city. Moccasin Creek has a watershed that encompasses 191,503 acres (42,218 hectares) of predominantly agricultural land.

This project is intended to be the initial phase of a watershed wide restoration project. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in the final project report.

The purpose of this Pre-Implementation Assessment is to determine the sources of impairments to Moccasin Creek in Brown County, South Dakota, and the un-named tributaries in the watershed. The watershed ultimately drains to the James River. The creek and small tributaries are intermittent streams with loadings of sediment and nutrients related to snowmelt or rainfall events.

Moccasin Creek is a tributary to the James River that runs through the city of Aberdeen, SD. The creek receives storm sewer discharges from the entire city of Aberdeen and has experienced a buildup of sediment. Sections of the stream have been impacted by channelization and there are numerous road crossings for the length of the creek. Reaches of the stream that are in the city are choked with aquatic vegetation, such as cattails and bulrush. Recreational use of the stream is limited.

The surface watershed area for Moccasin Creek is approximately 191,503 acres (42,218 hectares) in size. The city of Aberdeen (population 25,000) is the largest municipality located in the watershed. The only other communities in the watershed are Bath (population 175) and Warner (population 336).

Land use in the watershed is primarily agricultural. Approximately 67 percent of the landuse is cropland and 27 percent grass or pasture. Corn, soybeans, sun flowers and small grains are the main crops. Some animal feeding operations are located in the watershed. Farming in the watershed is diversified. Livestock and livestock products are sources of income, but income from cash crops is also important.

The average annual precipitation in the watershed is 21.1 inches of which 77% usually falls in April through September. Thunderstorms occur on about 40 days each year, and most occur in summer. Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration and occasionally produce heavy rain fall events. The average seasonal snowfall is 29.3 inches per year.

The landscape in the watershed is characterized by many potholes, sloughs, and lakes. The relief in the area is nearly level. Land elevation ranges from about 1375 feet msl in the west and north parts of the watershed to about 1,275 msl in the eastern part. Highway Department maps showing culvert and bridge locations have been obtained.

Minnesota River Basin

Big Stone Lake/Little Minnesota

Grant: 1996 Status: Completed Completion Date: 12/31/99

Description: The overall goal of the restoration effort is to increase the recreation potential and lifespan of Big Stone Lake by decreasing sediment and phosphorous loadings by 56 percent. Big Stone Lake is a hypereutrophic lake subject to excessive nutrient and sediment loadings. The loadings stimulate algal blooms and aquatic plant growths which limit the beneficial uses of the lake. Agriculture land presently contributes 88 percent of the phosphorous entering the lake. The 319 project funds will supplement a PL566 USDA project. The initial efforts to reduce NPS loadings was funded through a 319 project (1992). The tasks which will be initiated through this phase are:

1.) Construction of 7 Animal Waste Management Systems (AWMS);
2.) Convert 4000 acres of cropland to NO-TILL tillage systems;
3.) Create 33 multiple use wetlands;
4.) Restore 1800 feet of riparian areas at 3 sites; and
5.) Implement an extensive Education & Information (I&E) program

Big Stone Lake Restoration

Grant: 1999 Status: On Schedule Completion Date: 12/31/03

Description: The overall goal of the restoration effort is to increase the recreation potential and lifespan of Big Stone Lake by decreasing sediment and phosphorous loadings by 56 percent.

Big Stone Lake is a hypereutrophic lake subject to excessive nutrient and sediment loadings. The loadings stimulate algal blooms and aquatic plant growths which limit the beneficial uses of the lake.

Agriculture land presently contributes 88 percent of the phosphorous entering the lake. The 319 project funds will supplement a PL566 USDA project. The initial efforts to reduce NPS loadings was funded through a 319 project (1992). The tasks which will be initiated through this phase are:

1.) Construction of 7 Animal Waste Management Systems (AWMS);
2.) Convert 4000 acres of cropland to NO-TILL tillage systems;
3.) Create 33 multiple use wetlands;
4.) Restore 1800 feet of riparian areas at 3 sites; and
5.) Implement an extensive Education & Information (I&E) program

Cochrane & Oliver TMDL

Grant: 1999 Status: Completed Completion Date: 3/31/00

Description: The long term goal of the Lake Cochrane/Lake Oliver watershed Assessment Project is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration alternatives in order to provide adequate background information needed to drive a watershed implementation project to improve water quality.

Lake Cochrane (336 acres) and Lake Oliver (172 acres) are small, glacial lakes in northeastern South Dakota. Lake Cochrane has been a popular recreation lake for many years and is highly prized by local residents because of its water quality and greater than average depth (11 ft) for lakes in the area. Due to series of unusually wet years, Deuel County has experienced problems with flooding. The flooding has caused local residents to become concerned about the water quality of Lake Cochrane.

The project will assess the effect, if any, Lake Oliver has on Lake Cochrane. The project will also identify all critical point and non-point sources in both watersheds and develop restoration alternatives to improve the water quality in both lakes. The project is intended to be the first phase of a watershed restoration project.

Lake Hendricks Watershed
Grant: 1998 Status: On Schedule Completion Date: 4/1/01
Description: The goal of the Lake Hendricks/Deer Creek Watershed Project is to reduce the mean in-lake total phosphorus concentration to less than 100 ppb, to reduce the potential for fecal coliform bacteria in excess of water quality standards and to reduce soil erosion and sediment loadings to the lake. The project is a three year project designed to reduce nutrient, fecal coliform bacteria, and sediment loadings to the lake. Project goals will be achieved by installing ag-waste systems and diversions, integrated crop management, grazing systems, waterways and other BMPs. An educational program will be used to inform the public about cost-share programs and water quality. Interest groups from the lake and watershed have completed a ten month Coordinated Resource Management (CRM) process. This proposal reflects the result of the CRM process.

Lake Hendricks is a shallow prairie lake located at the headwaters of the Lac Qui Parle river, a major tributary of the Minnesota river. The 1,532 acre lake lies along the South Dakota-Minnesota border. Its 25,600 acre watershed contains areas in South Dakota and Minnesota. The South Dakota portion of the watershed is 70% or 18,000 acres of the total watershed. water quality of the lake has deteriorated due to excessive nutrient and sediment loading associated with land use practices in the watershed and shoreline erosion. Algal blooms dominate the open water season limiting recreational use of the lake. the Deer Creek subwatershed has been identified as the main avenue of nonpoint source pollution entering the lake, including nutrients and fecal coliform bacteria. This subwatershed will be the primary focus of the proposed project.

Designated beneficial uses of Lake Hendricks are warm water semi-permanent fish life propagation, immersion recreation, limited contact recreation, wildlife propagation and stock watering. Those for Deer Creek are irrigation, wildlife propagation, and stock

watering. Fish and wildlife propagation, recreation, and other uses of the lake are currently impaired or in danger of being impaired because of nonpoint source pollution from the watershed and lake shore. Restoring and maintaining full beneficial uses will involve implementation of practices that address the nonpoint source priority category, agriculture. Subcategories addressed include cropland, rangeland, pastureland, feedlots and animal holding/management areas.

Statewide

Buffer salesmen

Grant: 1998 Status: On Schedule Completion Date: 12/31/00

Description: The major goals of this project is to provide accelerated design assistance and nutrient management assistance to individual landowners and education assistance to county and local governments in reducing pollutant loads to surface and shallow groundwater of eastern South Dakota.

The project will also provide information and education to local and county level governments so they can develop a better understanding of resource problems associated with siting and permitting of concentrated livestock operations. Animal waste utilization plans will be developed for each animal waste system constructed with follow-up on existing systems to ensure waste is being used in an effective and efficient manner. The project will be a three year project sponsored by the South Dakota Association of Conservation Districts, which will contract with technical personnel, to provide the services and work with the private operators in development of animal waste management systems.

Animal Waste Team III

Grant: 1998 Status: On Schedule Completion Date: 12/31/00

Description: The major goals of this project is to provide accelerated design assistance and nutrient management assistance to individual landowners and education assistance to county and local governments in reducing pollutant loads to surface and shallow groundwater of eastern South Dakota.

The project will also provide information and education to local and county level governments so they can develop a better understanding of resource problems associated with siting and permitting of concentrated livestock operations. Animal waste utilization plans will be developed for each animal waste system constructed with follow-up on existing systems to ensure waste is being used in an effective and efficient manner. The project will be a three year project sponsored by the South Dakota Association of Conservation Districts, which will contract with technical personnel, to provide the services and work with the private operators in development of animal waste management systems.

Bootstraps

Grant: 1997 Status: On Schedule Completion Date: 6/30/01

Description: The project will provided assistance to local producers for the formation of Bootstraps groups, coordination of efforts in providing assistance to groups formed and financial assistance for the completion of resource inventories and management plans based on the results of the resource inventories. Bootstraps is a holistic strategy for sustainable agriculture. Since the program was initiated in SD during 1992 over 280 SD farm/ranch families who operate a cumulative total of over 900,000 have been involved in the program. There are
currently 13 active groups in the state. Additional groups are planned. The groups are providing the base grassroots support and leadership for the newly formed SD Grasslands Coalition.

Ground Water Monitoring Network
Grant: Status: Completion Date:
Description: This project will provide the physical system needed to assess nonpoint source pollution in South Dakota's sensitive surgical aquifers. The physical system will consist of wells and dedicated ground water purging/ sampling equipment. The objectives of the project are:
1.) select appropriate monitoring sites;
2.) install the monitoring network;
3.) develop newly installed monitoring wells; and
4.) disseminate the project information.

The SD groundwater network presently consists of 145 water quality monitoring wells that occur at 80 total sites in 24 aquifers. Each well has dedicated sampling equipment. Forty of the sites, containing a total of 86 monitoring wells (68 four inch, 18 two inch), were established during the project.

Nonpoint Source Information / Education 1994
Grant: 1994 Status: On Schedule Completion Date: 3/31/00
Description: This project is the continuation of the statewide information and education program implemented to inform South Dakotans of the importance of water quality. Through the program, the state's citizens will continue to become better informed about why water quality is important and how they can protect it through changes in their behavior and activities. The goal of the project is to heighten nps awareness of the citizens of South Dakota to facilitate changes in life activities that contribute to NPS pollution.

Nonpoint Source Information / Education 1996
Grant: 1996 Status: On Schedule Completion Date: 4/1/99
Description: Continuation of the statewide information and education program implemented to inform South Dakotans of the importance of water quality. Through the program the state's citizens will continue to become better informed about why water quality is important and how they can protect it through changes in their own behaviors and actions.

To achieve the goal of the program, a variety of activities from the current project will be expanded and others initiated. Products to be produced by this proposal include:
1) Continue water festivals at 7 locations and expand to one additional site
2) Update the Interactive Touch Screen Display (Kiosk) modules into CD-Rom
3) Continue Adopt-A-Stream and citizen water quality monitoring programs and expand to include additional sites and water quality parameters
4) Continue the stormdrain stenciling program and expand it to additional municipalities
5) Gather educational materials for distribution at water festivals and events
6) Develop a water resources brochure to communicate water quality & quantity
7) Implement Coordinated Resource Management training on a statewide basis.

Statewide Lake Assessment
Grant: 1998 Status: Completed Completion Date: 6/30/00
Description: The goal of this project is to continue a state wide lake database that began in 1979. One-fourth of the lakes will be sampled each year. There are approximately 125 lakes in the database at the present time. Biological samples, along with field and chemical parameters, will be collected from each lake. Carlson's Trophic State Index (TSI) will be calculated for chlorophyll "a", secchi depth, and total phosphorus. Trends of the TSI parameters will be calculated and graphed. It is the programs goal to continue this sampling every year to maintain data integrity. The information will be placed in a database where it can be retrieved efficiently.

South Dakota has approximately 799 public waterbodies covering an estimated 1,500,000 acres including the reservoirs in the Missouri river system. The state has an obligation to manage these waterbodies This project is designed to establish baseline water quality and biological data on 125 of the most publicly used lakes greater than 100 acres with public access. There are a few exceptions to the previous statement in the case of the Black Hills reservoirs and a few other small but highly used lakes. Due to time constraints, the lakes will be sampled on a minimum 4 year rotating basis. By sampling every three or four years, the program will establish a baseline trend of the condition of the lake. This information can be used to set priority waterbodies, establish and track protection lakes, and give information on the lakes increasing or decreasing in water quality. The information can also be used as a baseline data in future 319 assessment and watershed projects and in the 305b Report to Congress. This grant application is intended to fund sampling for 63 lakes. Half of the lakes will be sampled in 1998 and the other half will be sampled in 1999. Application for funding for the other 63 lakes will take place in 1999 for sampling in the years 2000 and 2001.

Active 604(b) Project Summaries

Belle Fourche River Basin

Bear Butte Creek TMDL Assessment
Grant: 98 Status: Open
Description: The Elk Creek Conservation District will sponsor an assessment of the lower reach of Bear Butte Creek, downstream from the city of Sturgis. The data to be collected will include landuse, macroinvertebrate and water quality data necessary to complete a watershed assessment and develop a TMDL.

Update: Data was collected summer of 2000. Data analysis, interpretation and final report remain.

Big Sioux River Basin

Lake Alvin/Nine Mile Creek TMDL
Grant: 98 Status: Closed
Description: Lake Alvin was designated as a high priority for TMDL development in the 1998 South Dakota Waterbody List with a target TMDL completion date of March 31, 2000. The watershed assessment will determine the current condition of the lake and fulfill the data requirements for completing the TMDL. Assessment activities include the Agricultural Non-Point Source Model, water quality monitoring, and a biological assessment.

The Lincoln County Conservation District has accepted the role as local sponsor. Local cash and in-kind match commitments have been provided by the cities of Tea and Harrisburg as well as the Lincoln County Commission and the conservation district. The SD Game, Fish & Parks has also committed to providing personnel to assist in the collection of samples.

Update: The assessment activities are complete. The TMDL / final report is drafted and in review.

Lakes Herman, Madison, Brandt Project Planning
Grant: 98 Status: Closed
Description: Phase I watershed assessments have been completed on both Lake Madison and Lake Herman watersheds. Due to the surface and ground water interactions between Lake Herman, Lake Madison, Round Lake and Brant Lake, a joint advisory group, the Lake County Watershed Improvement Association, was formed to plan and promote a Phase II or implementation of restoration activities.

The main goal of the Phase II project will be to reduce phosphorus inputs to the lake at the sources. These funds will be used in the preparation of the 319 application that will ultimately result in TMDLs.

Update: Application has been prepared and project is closed. The 319 implementation project has been initiated.

Grand River Basin

Grand River Watershed TMDL

Grant: 98 Status: Closed

Description: These funds will allow the purchase of needed equipment by the Perkins County Conservation District for the Section 319 Watershed Assessment/TMDL Project. Due to the short duration of the TMDL projects, additional equipment is needed to ensure accurate data is collected. Once the TMDL projects are completed the equipment will be returned to the state and used on other watershed assessment/TMDL projects.

Update: Equipment has been purchased and project is closed. The 319 watershed assessment/TMDL project is underway.

James River Basin

Moccasin Creek Watershed TMDL

Grant: 98 Status: Closed

Description: These funds will allow the purchase of needed equipment by the South Brown Conservation District for the Section 319 Watershed Assessment/TMDL Project. Due to the short duration of the TMDL projects, additional equipment is needed to ensure accurate data is collected. Once the TMDL projects are completed the equipment will be returned to the state and used on other watershed assessment/TMDL projects.

Update: Equipment has been purchased and project is closed. The 319 watershed assessment/TMDL project is underway.

Wylie Pond Assessment

Grant: 00 Status: Open

Description: Wylie Pond was listed in the 1998 South Dakota Waterbody List as impaired for recreational uses by fecal coliform bacteria. The assessment project includes in-lake physical, chemical and biological water quality monitoring, and surveys of landuse and potential pollution sources. This project is being conducted in conjunction with the Section 319 Moccasin Creek Watershed Assessment project.

Update: Task 1 In-lake samples - all samples have been collected and task is complete.
Task 2 Algae samples - all samples have been collected and task is complete.
Task 3 Sediment sample - to be complete winter, 2000.
Task 4 Landuse survey - to be complete March, 2001.
Task 5 TMDL and final report - draft expected by January, 2002

Minnesota River Basin

Blue Dog Lake/Enemy Swim Septic Leachate Survey

Grant: 98 Status: Closed

Description: Residents of Enemy Swim Lake, which is known as one of the state's best water quality lakes, have voiced concerns regarding declining water quality in recent years. There are a number of cabins on the lake with septic systems which may be contributing to the water quality decline. In an effort to pinpoint the effectiveness of septic systems, a survey of Enemy Swim Lake is to be completed. This survey will conclusively pinpoint hotspots where upon remedial measures can be taken in improving the waste systems. This project is intended to accent the current 319 assessment project for Enemy Swim Lake.

Update: Survey has been completed and project is closed out. Results of the survey were included in Blue Dog /Enemy Swim Final Assessment Report.

Lake Cochrane/Oliver TMDL
Grant: 98 Status: Closed
Description: These funds will allow the purchase of needed equipment by the Deuel County Conservation District for the Section 319 Watershed Assessment/TMDL Project. Due to the short duration of the TMDL projects, additional equipment is needed to ensure accurate data is collected. Once the TMDL projects are completed the equipment will be returned to the state and used on other watershed assessment/TMDL projects.

Update: Equipment has been purchased and project is closed. The assessment project is complete and the final report/TMDL is ready to be published.

Appendix B – Information and Education Project Matrix

ACTIVITY	PRIMARY TARGET AUDIENCE	PRIORITY AREA	DENR PROGRAM INTERFACE	PRIMARY PROJECT PARTNER(s)	IMPLEMENTATION STATUS
Volunteer Watershed Activities Citizens Monitoring	General/Urban	TMDL	Surface Water	SD Lakes & Streams Assoc. SD Discovery Center Local Organizations Water Development Districts	Ongoing. Financial assistance provided 319 Grant through DENR and RGI Grant from EPA.
Storm drain Stenciling	Urban	TMDL Nutrient Management	Surface Water Source Water	SD Lakes & Streams Assoc. SD Discovery Center Local Organizations Water Development Districts	
Adopt*A*Stream	General/Urban	TMDL Nutrient Management	Surface Water Source Water	SD Lakes & Streams Assoc. SD Discovery Center Local Organizations Water Development Districts	
Coordinated Resource Management	Agriculture General Adult/Urban	TMDL Nutrient Management	All Media Programs	SDACD Midwest Mediation NRCS USFWS US Forest Service Northwest Area Foundation	Facilitator training and process manuals funded through 319 Grant from DENR and Northwest Area Foundation complete. Process manual and training for local groups available upon request.
Bootstraps	Farmers and Ranchers	TMDL	Pollution Prevention Ag Waste Workgroup	NRCS & RC&Ds SDSU Extension Service SD Dept. of Ag SDACD & Conservation Districts SD Grasslands Coalition	Program development complete. Transfer to new user groups ongoing. Assistance to new groups and support of activities related to resource management plans developed available through 319 grant from DENR to SDACD.
Precision Farming	General Agriculture	TMDL Nutrient Management	Pollution Prevention Surface Water Source Water	SDSU Extension Service NRCS SDACD SD Dept. of Ag	In progress. Financial assistance provided through P2 Program.

No-till Farming	General Agriculture	TMDL Nutrient Management	Surface Water Source Water	SDSU Extension Service NRCS SDACD SD Dept. of Ag SD No-till Association Ducks Unlimited	In progress. 319 funded project complete. Project continuing with funding from other sources.
BMP Training Silviculture	Timber Industry	TMDL Riparian Areas Sediment	Surface Water Source Water	SD Forest Resource Association SD Dept. of Ag USFS	In progress. Two workshops held summer 2000. Field audit of BMPs planned summer 2001.
Individual Wastewater Treatment Systems	Home Owners Planning and Zoning	TMDL Nutrient Management Ground Water	Ground Water Source Water Pollution Prevention	Black Hills RC&D SDSU Extension Service	In progress. Two workshops held spring 2000. Additional outreach activities and production of BMP video planned.
Urban Stormwater	Public Works Depts.	TMDLs Sediment	Pollution Prevention Surface Water Source Water	American Public Works Assoc. Municipal League	In progress. Completion of model prevention-based stormwater plans scheduled July 2001. Model plans will serve as model for plan development by other communities.
Urban Sediment	Public Works Depts. Planning and Zoning Construction Industry	TMDLs Sediment	Pollution Prevention Surface Water Source Water	American Public Works Assoc. Municipal League NRCS	Continuing. Slide set developed through 319 NPS I&E Program grant. Workshop held spring 1996 with support through P2 Program. Second workshop targeting construction industry in planning stages.
Riparian	General Agriculture Livestock Producers General Urban	TMDL Nutrient Management Sediment	Surface Water Source Water	SD Grassland Coalition NRCS RC&Ds SDSU Extension Service	Continuing. Three workshops using vegetative methods conducted and East River Riparian Demonstration Project completed with financial support through 319 Program. Workshops using distance learning in combination with site specific field experiences in planning.
Grazing Management	Livestock Producers	TMDL Nutrient Management Sediment	Surface Water	RC&Ds NRCS SDACD & Conservation Districts	Lead partner Lower James RC&D with funding through SD Soil and Water Conservation Fund Grant from the SD Conservation

				SDSU Extension Service SD Dept. of Ag SD Grassland Coalition SDGFP	Commission. Financial assistance for demonstration sites provided through Bootstraps and watershed projects.

Manure Management Video & Training	Livestock Producers	TMDL AFO/CAFO - Nutrient Management	Ag Waste Workgroup Pollution Prevention	SDACD & Conservation Districts NRCS RC&Ds SDSU Extension Service	"Protecting Our Water", a video describing AFO/CAFO requirements in SD produced and aired over PBS. Copies available through local libraries and DENR. Training of permitted facility owners ongoing through SDSU. Financial assistance for video production and development of training provided through 319 I&E and P2 Programs.
Exhibit	Livestock Producers General Adult/Urban	TMDL AFO/CAFO - Nutrient Management	Ag Waste Workgroup Pollution Prevention Source Water Surface Water Ground Water	SDACD & Conservation Districts NRCS RC&Ds SDSU Extension Service SD Cattleman's Association	Ongoing. Exhibit at DakotaFest 1999 and 2000 as central activity for Managing Manure for Profit and the Environment Outreach Strategy. Possible expansion to other major trade shows in development. DENR financial assitance provided through 319 and P2 Programs.
Publication	Livestock Producers General Adult/Urban	TMDL AFO/CAFO - Nutrient Management	Ag Waste Workgroup Pollution Prevention Source Water Surface Water Ground Water	SDACD & Conservation Districts NRCS RC&Ds SDSU Extension Service SD Cattleman's Association Utah Dept. of Ag and Food	In progress. Managing Manure for Profit and the Environment Outreach Strategy publication designed to provided producers and the general public "easily understood" information about the why, how and where to get manure management assistance. Initial distribution at DakotaFest 2000 and SD State Fair 2000. Copies placed at county extension and conservation offices. DENR assistance provided through 319 and P2 Programs. Printing cost paid by EPA Region VIII 104(b)(3) Grant to Utah Dept. of Ag and Food.
Phosphorus Based Nutrient Management	Livestock Producers	TMDL AFO/CAFO - Nutrient Management	Ag Waste Workgroup Pollution Prevention Source Water Surface Water Ground Water	SD Cattleman's Association SDSU Extension Service SDACD & Conservation Districts NRCS RC&Ds	In progress. Financial Assistance provide to SD Cattleman's Association through DENR's 1999 PPIS Grant from EPA.
BMP Video	Livestock Producers	TMDL	Ag Waste Workgroup	SDSU Extension Service	In progress. Segments on different

Manure Management (cont.)	General Rural /Urban	AFO/CAFO - Nutrient Management	Pollution Prevention Source Water Surface Water Ground Water	SDACD NRCS	BMPs scheduled for airing Fall 2000 on Today's Ag. Project funding provided to SDSU by 319 I&E grant through DENR.
Web Site	Livestock Producers General Agriculture General Adult/Urban	TMDL AFO/CAFO - Nutrient Management	Ag Waste Workgroup Pollution Prevention Source Water Surface Water Ground Water	SDSU Extension Service SDACD & Conservation Districts NRCS RC&Ds	In development by SDSU and Ag Waste Team. Financial support for Ag Waste Team provided by a 319 Grant through DENR.
Interactive Display Touch Screen (Kiosk)	Middle & High School Students	TMDL Nutrient Management Forest BMPs	Surface Water Ground Water Source Water Pollution Prevention	SD Dept. of Ag Society of American Foresters SDSU Extension Service USFS SD Discovery Center & Aquarium	Funding for development of watershed related program segments and all hardware provided through 319 I&E. One unit on permanent loan to SD Discovery Center & Aquarium. Portable unit available for loan to local agencies and schools on request.
Conversion of Touch Screen to CD	Middle & High School Students	TMDL Nutrient Management Forest BMPs	Surface Water Ground Water Source Water Pollution Prevention	SD Dept. of Ag Society of American Foresters SDSU Extension Service USFS SDACD SD School of Mines & Technology	In progress. Funding and technical assistance for conversion provided through 319 I&E Program. Distribution to elementary & middle schools planned for Fall 2000/Winter 2001.
Region VIII NPS CD	Middle & High School Students	TMDL Nutrient Management	Surface Water Ground Water Source Water Pollution Prevention	Region VIII State NPS Programs Utah State University	In progress. Funding provided by 319 grant from EPA to Utah State University. Projected completion date Fall 2000; distribution Winter/Spring 2001.
Water Festivals	Elementary School Students	TMDL Nutrient Management	All Media Programs	Water Development Districts Conservation Districts Watershed Projects Colleges/Universities SD Discovery Center	Funding for initial development and coordination provided through 319 I&E Program. Festivals continuing under local leadership. Financial assistance encouraged through watershed project I&E component.

Wetlands	General Rural/Urban	TMDL Nutrient Management	Surface Water Ground Water Source Water	SDACD & Conservation Districts NRCS RC&Ds SDSU Extension Service SD Dept. of Ag	Local watershed projects and environmental groups encouraged to include in project workplan. I&E component or using funds available for wetlands from other sources Statewide project through 319 I&E Program not planned at this time.
Project SAVE	Students – All Levels	General Environment TMDL Nutrient Management	Pollution Prevention All Media programs SDGeological SurveyS	SDSU SD Discovery Center Capital University Center	Curriculum development completed using state funds. Financial assistance for initial teacher training workshops provided through DENR P2 Program. Offering program currently licensed to Capital University Center. K-12 modules being prepared for posting on DENR web site by SDGS. Publication of secondary modules planned through cooperative project with SDSU.
Presentations, Exhibits and Demonstrations	General (Varies by topic)	TMDL Animal Waste Sediment Project Planning	Surface Water Source Water Ag Waste Pollution Prevention	Local, state and federal Agencies Organizations	Display materials purchased with 319 I&E and P2 funds. Exhibits and presentations available on variety of topics including TMDLs, project planning, GIS and P2 for use at conferences, fairs and other events as requested.
Project Coordinator Training	Watershed Project Coordinators	TMDL Project Areas	Pollution Prevention Financial Management	NRCS Conservation Districts Water Development Districts	In progress. Onsite project management and water quality monitoring training and assistance ongoing. Two-day training session scheduled September 2000.