SECTION 319 NONPOINT POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

LOWER BIG SIOUX RIVER WATERSHED IMPLEMENTATION PROJECT SEGMENT 2

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Lincoln County Conservation District

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This project was completed in cooperation with the South Dakota Department of Environment and Natural Resources and the United States Environmental Protection Agency, Region 8.

Grant #9998185-08, 9998185-10,

EXECUTIVE SUMMARY

PROJECT TITLE: Lower Big Sioux River Watershed Project Segment 2

PROJECT START DATE: 1 July, 2010

PROJECT COMPLETION DATE: 31 July, 2012

FUNDING:

Funding Sources	**Original Budget**	**Expended**
U.S. EPA Section 319 Grants		
C9998185-08	$75,000.00	$73,750.89
C9998185-10	$325,000.00	$36,010.86
Total 319	**$400,000.00**	**$109,761.75**
Cons. Comm.	$8,117.00	$0.00
CWSRF Admin Funds	$86,000.00	$0.00
EQIP	$240,000.00	$56,270.20
SD GF&P	$20,000.00	$0.00
USDA	$75,400.00	$39,221.87
Local Cash and In-Kind Match	$191,833.00	$95,153.63
Totals:	**$1,021,350.00**	**$300,407.45**

The project goal was “Improve the water quality of the Lower Big Sioux River by implementing Total Maximum Daily Loads (TMDLs) developed for this section of the river”.

To attain the goal the following actions were taken during this project segment:

- working with local citizens and organizations to develop a TMDL implementation strategy based on the watershed assessment and TMDLs to guide future project segments
- initiating a public education and outreach campaign to inform landowners, stakeholders and area residents on water quality issues and Best Management Practices (BMPs) important to the Lower Big Sioux River Basin Watershed and
- installation of BMPs targeted towards identified high priority sub-watersheds

This was Segment 2 of several planned implementation segments designed to implement BMPs, and therefore, restore and protect the water quality of the Lower Big Sioux River. During this segment, additional stream TMDLs were still being developed with load reductions goals to be established when the TMDLs were finalized and listed in subsequent project proposals.

The project goal was established based on water quality information gathered during the Lower Big Sioux River Watershed Assessment project completed during 2002. Initial water quality data indicated high levels of fecal coliform bacteria and Total Suspended Solids (TSS) in both the Lower Big Sioux River and its tributaries which resulted in the placement of all five reaches of the Lower Big Sioux River on the 303d waterbody list as impaired during 2004. The first Project Implementation Plan (PIP) was developed during October 2007 to initiate a watershed project and gear up for installing BMPs designed to reduce fecal coliform bacteria and TSS loading into the River. The proposal was based on data from the assessment project and the Fecal Coliform and TSS TMDL reports for the Lower Big Sioux River Watershed which was completed during 2008 to 2011. The reports are available on the SD DENR watershed protection page in Adobe (.pdf) format. To see which reports have been initiated and approved, click the link: http://denr.sd.gov/dfta/wp/tmdlpage.aspx

During the 2002 watershed assessment, 500 feedlots were located and analyzed using the Agricultural Non-Point Source (AGNPS) pollution feedlot model. Of the 500 feedlots assessed, 178 feedlots were rated at or above 50. Seventy nine of the 178 feedlots rated at or above 50 were located in Lincoln County and the remaining 99 were located in Union County. Prioritization of animal feeding operations with AGNPS ratings over 50 in all reaches of the watershed, through the use of mapping tools, was used as a starting point for implementation.

A majority of work in the watershed during Segment 2 of the project consisted of producer contacts and meetings. This was done to educate and inform them about the project and opportunities for technical and financial support to install BMPs that improved water quality. Producers with high priority feeding operations were visited during the project. Many of them were aware of water quality issues associated with the Lower Big Sioux River, but a majority did not know about the technical a financial assistance available to them. Initial contacts consisted of a general overview of the project and project goals followed by BMP discussions and

producer planning. Additional meetings were conducted to identify specific issues associated with their operation and how they could be addressed.

A total of 2 feasibility studies, 2 waste storage facility designs and 1 nutrient management plan were completed during segment 2 of the project. Conservation Reserve Program (CRP) practices installed consisted of 287 acres of native grass seeding, filter strips, riparian buffers and 11,190 linear feet of grassed waterways. Nutrient management plans have been written for 2 confinement operations adopting conservation tillage on 1,099 acres of cropland in order to comply with NRCS 590 standards for erosion. Environmental Quality Incentive Program (EQIP) and 319 dollars have helped with implementation of 43,363 linear feet of terraces and one grazing system consisting of 160 acres. Outreach continues to be aimed towards terrace restoration and waste storage facilities for livestock operations to help reduce total suspended solids and fecal coliform bacteria in the watershed.

In August 2012 the Lower Big Sioux Segment 2 Watershed Project was merged with the Central Big Sioux River Implementation Project Segment 2. The combined watershed Project Implementation Proposal was completed, reviewed and accepted in September 2012. The decision to merge the two watershed projects was based in part on geographic location, funding and personnel restructuring. The milestones, budget and BMPs were combined to satisfy the load reductions needed to fulfill the TMDLs set for the Central and Lower Big Sioux River Watersheds. The combination of the two projects resulted in the Central Big Sioux River Watershed Implementation Project Segment 2. The Moody Conservation District is the lead sponsorship of the project. Brookings, Lake, Minnehaha, Lincoln and Union Counties remain co-sponsors for the project and regularly attend stakeholder and steering committee meetings.

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INTRODUCTION

Watershed Basin

The Big Sioux River, which originates north of Watertown, South Dakota, flows generally south for 420 miles to its confluence with the Missouri River near Sioux City, Iowa. A summary of the Lower Big Sioux River Basin features is listed in Table 1.

The Lower Big Sioux River forms the boundary between South Dakota and Iowa near Brandon, SD to Sioux City, IA. The TMDL watershed project area is shown in Figure 1. Major tributaries to the Lower Big Sioux in the Iowa reach include the Rock River, drainage area 1,688 square miles, and Indian Creek with a drainage area of 63 square miles. Major tributaries to the Lower Big Sioux in the South Dakota portion of the reach include Brule Creek, Beaver Creek, Ninemile Creek, and Pattee Creek which have drainage areas of 214, 99, 44, and 41 square miles, respectively. The river meanders between Sioux Falls and Sioux City (linear distance 75 miles; river distance 125 miles). The meandering nature of the river creates a diversity of aquatic habitats. Agriculture, specifically row crops and livestock feeding operations with mostly open feedlots is the main land use in the watershed.

Table 1: Lower Big Sioux River and its Basin Features.

Waterbody Name:	**Big Sioux River, seven and five impaired segments in IA and SD, respectively**
Hydrologic Unit Code:	Big Sioux River – 10170203; Rock River – 10170204
SD DENR Waterbody ID:	SD-BS-R-BIG_SIOUX_13-17
Location:	S33, T92N, R49W to S25, T100N, R49W
Water Quality Standards and Designated Uses:	See Table 2 and Table 3
Major Tributaries (Iowa):	Rock River, Indian Creek
Major Tributaries (South Dakota):	Beaver Creek, Brule Creek
Receiving Waterbody:	Missouri River
Stream Segment Length (Iowa):	125 miles
Stream Segment Length (South Dakota):	130 miles

Watershed Area:	
Total	9,570 square miles
Iowa	1,436 square miles
South Dakota	6,603 square miles
Minnesota	1,531 square miles

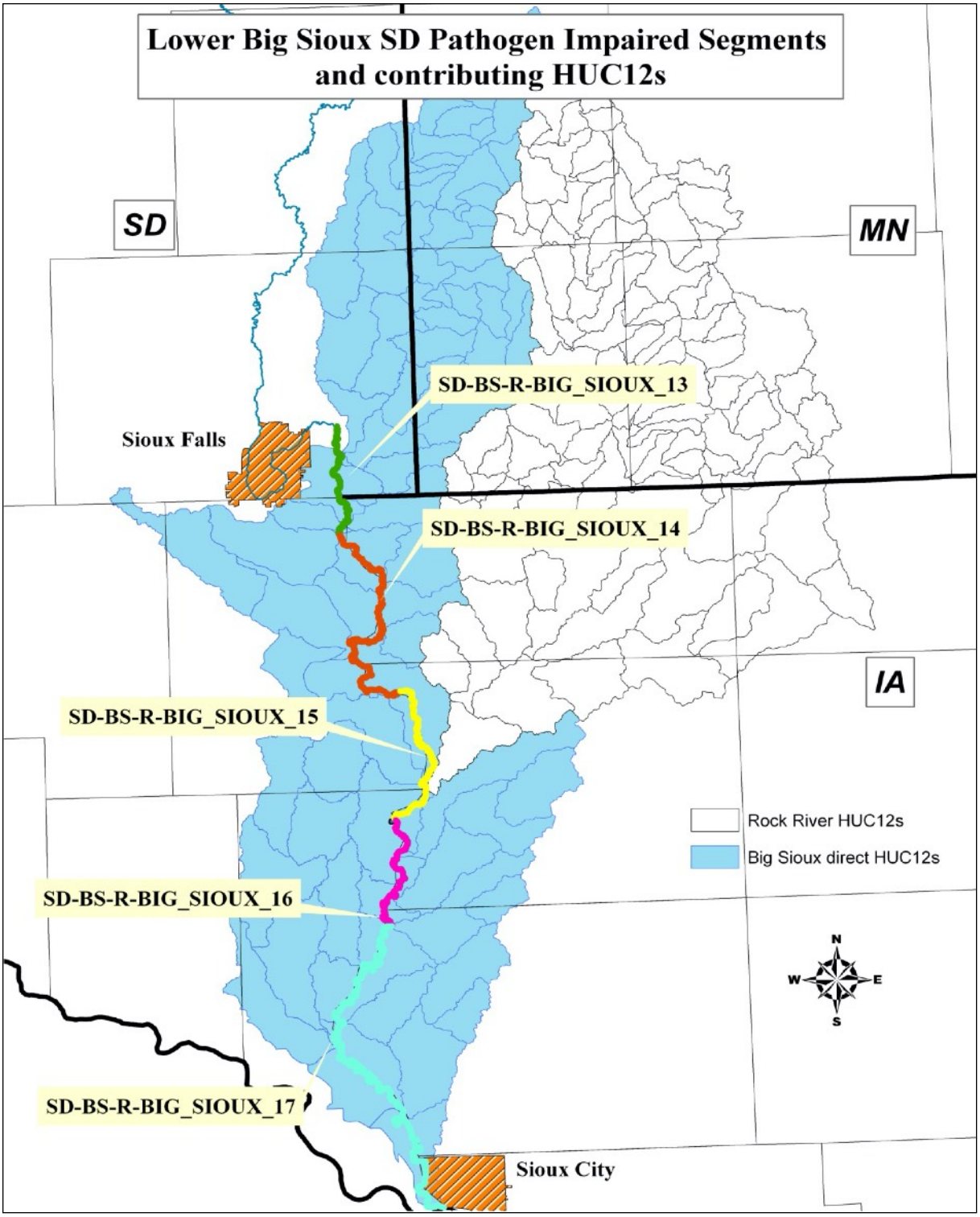


Figure 1: Lower Big Sioux River TMDL Watershed

Water Body Description

The Lower Big Sioux River drains approximately 661,418 acres (1,033 miles^2) and 919,040 acres (1,436 miles^2) in South Dakota and Iowa, respectively. The watershed is located in the Northern Glaciated Plains and Western Corn Belt Plains ecoregions. The Northern Glaciated Plains ecoregion is characterized by a flat to gently rolling landscape composed of glacial drift. The Western Corn Belt Plains ecoregion is level to gently rolling glacial till plains with areas of moraine hills and loess deposits.

Wildlife that inhabit the area include whitetail deer, red fox, beavers, raccoons, ring-necked pheasants, mourning doves, and numerous other species of songbirds, waterfowl, reptiles and amphibians. The average rainfall is approximately 25 inches per year with 78 percent falling during the growing season. The average annual snowfall is approximately 34 inches but varies widely from year to year.

In South Dakota, the portion of the river that extends from the City of Brandon to the mouth of the river is divided into five impaired TMDL segments (Table 2) with beneficial uses and impairments.

SD-BS-R-BIG_SIOUX_13: Load duration curves included in the TMDL report indicate bacteria targets are exceeded at mid to high flow conditions and contribute to the impairment of the Lower Big Sioux River Segment at the monitoring site. This segment retains full support for 6 of the 7 beneficial uses but does not support immersion recreation because of fecal coliform levels.

SD-BS-R-BIG_SIOUX_14: Bacterial targets are exceeded at mid to high flow conditions in the mainstem river and high and low flows in the tributaries. This segment has full support for 6 of the 7 beneficial uses, but does not support immersion recreation because of fecal coliform levels.

SD-BS-R-BIG_SIOUX_15: Bacterial and TSS targets are exceeded at mid to high flow conditions. This segment is in full support for 5 of the 7 beneficial uses, but does not support immersion recreation and warm water semi permanent fish life propagation because of fecal coliform and total suspended solid levels.

SD-BS-R-BIG_SIOUX_16: Bacterial and TSS targets are exceeded at mid to high flow conditions. This segment is in full support for 4 of the 7 listed beneficial uses, but does not support immersion recreation, limited contact recreation and warm water semi permanent fish life propagation because of fecal coliform and total suspended solid levels.

SD-BS-R-BIG_SIOUX_17: Bacterial and TSS targets are exceeded at high flow conditions. This segment is in full support for 4 of the 7 listed beneficial uses, but does not support immersion recreation, limited contact recreation and warm water semi permanent fish life propagation because of to fecal coliform and total suspended solid levels.

Table 2: Beneficial Uses and Impairments for Targeted Project Water bodies.

Lower Big Sioux River Segments	From	To	Beneficial Uses	Impaired Uses	Impairment Cause
SD-BS-R-BIG_SIOUX_13	Above Brandon	Nine Mile Creek	5, 7, 8, 9, 10	7	Fecal Coliform
SD-BS-R-BIG_SIOUX_14	Nine Mile Creek	Fairview	5, 7,8, 9, 10	7	Fecal Coliform
SD-BS-R-BIG_SIOUX_15	Fairview	Alcester	5, 7, 8, 9, 10	5, 7	Fecal Coliform, TSS
SD-BS-R-BIG_SIOUX_16	Alcester	Indian Creek	5, 7, 8, 9, 10	5, 7, 8	Fecal Coliform, TSS
SD-BS-R-BIG_SIOUX_17	Indian Creek	Mouth	5, 7, 8, 9, 10	5, 7, 8	Fecal Coliform, TSS
Lower Big Sioux River Tributaries	**From**	**To**	**Beneficial Uses**	**Impaired Uses**	**Impairment Cause**
Beaver Creek (SD-BS-R-BEAVER_01)	Big Sioux River	S9, T-98N, R-49W	6, 8, 9, 10	8	Fecal Coliform
Big Ditch Creek (SD-BS-R-BIG_DITCH_01)	Headwaters	S21, T-92N, R-50W	9, 10	INS	
Unnamed tributary to Big Ditch (SD-BS-R-BIG_DITCH_TRIB_01)	Headwaters	Big Ditch Creek	9, 10	INS	
Brule Creek (SD-BS-R-BRULE_01)	Big Sioux River	Confluence of east and west forks	6, 8, 9, 10	Full Support	
East Brule Creek (SD-BS-R-EAST_BRULE_01)	Confluence with Brule Creek	S3, T-95N, R-49W	6, 8, 9, 10	6, 8	Fecal Coliform, TSS
Pattee Creek (SD-BS-R_ PATTEE_01)	Big Sioux River	Lake Lakota	5, 8, 9, 10	INS, NA	
Union Creek (SD-BS-R-UNION_01)	Big Sioux River	Confluence with east and west forks	6, 8, 9, 10	6, 8	Fecal Coliform, TSS

Numerical Key to Beneficial Uses listed in Table 2:

(1) Domestic water supply waters

(2) Coldwater permanent fish life propagation waters

(3) Coldwater marginal fish life propagation waters

(4) Warm water permanent fish life propagation waters

(5) Warm water semi-permanent fish life propagation waters

(6) Warm water marginal fish life propagation waters

(7) Immersion recreation waters

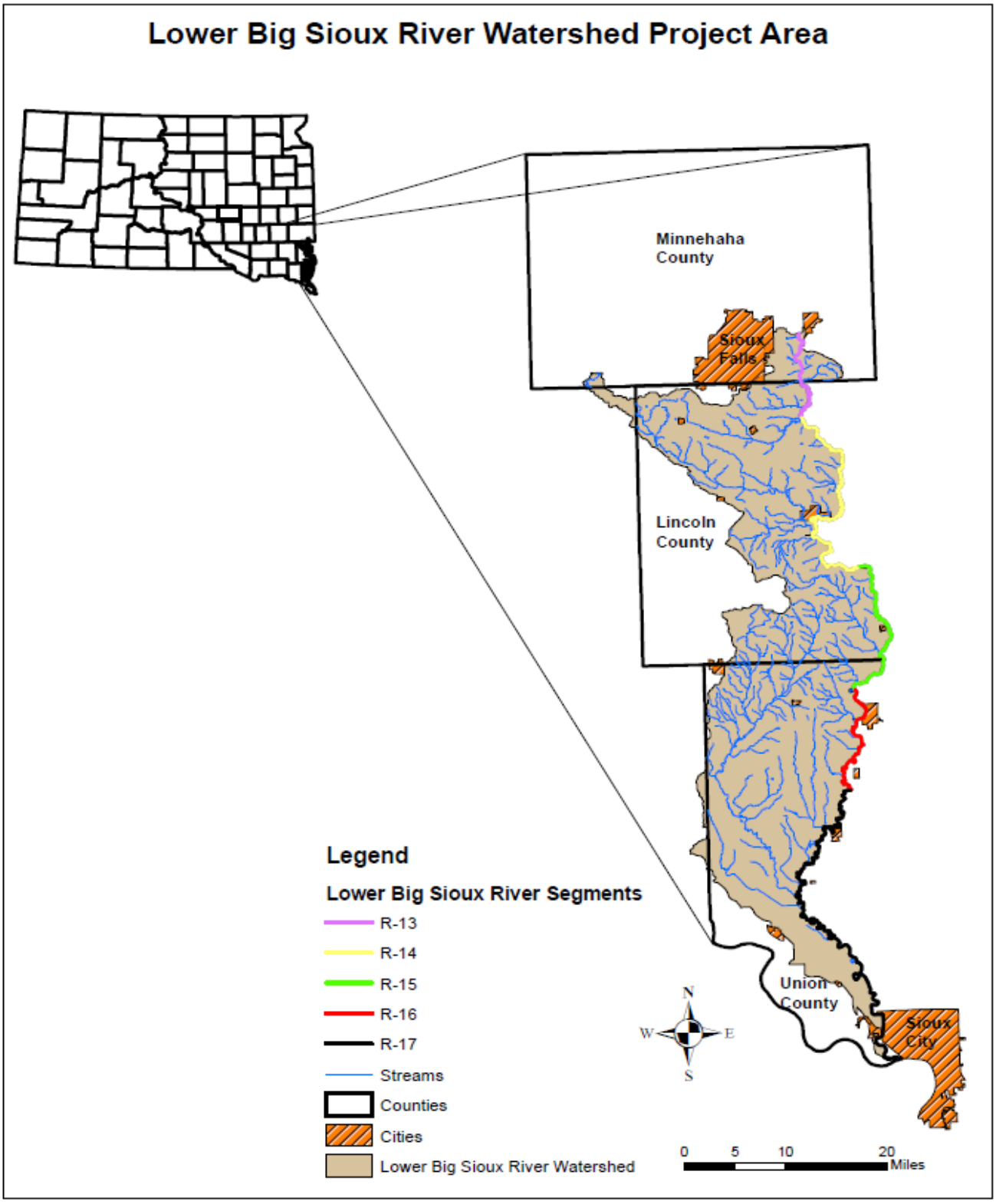
(8) Limited contact recreation waters

(9) Fish and wildlife propagation, recreation, and stock watering waters

(10) Irrigation waters

(11) Commerce and industry waters

INS = Insufficient Data



Project Area

The Lower Big Sioux River Project area starts at the confluence of Beaver Creek in southeastern Minnehaha County and extends to the mouth at the Missouri River. The majority of the

watershed is located in Lincoln and Union Counties with only a small portion in Minnehaha County. A large percentage of the project area is dominated by a rolling landscape with loess hills and intensive row crop farming and livestock operations. The southern edge of the project area drops down into the Missouri River Alluvial Floodplain and is dominated by mostly row crop agriculture with few livestock operations. The watershed project area encompasses 496,526 acres which is comprised of approximately 80% cropland, 15% pastureland and 5% residential and built up land (Figure 2).

There is a difference of 164,892 acres between the TMDL watershed and the implementation project watershed because of the shared monitoring site between the Central Big Sioux River Watershed Project and the Lower Big Sioux River Watershed Project. The overlapping watersheds that were included in the TMDL report were Slip-up Creek, Pipestone Creek, Split Rock Creek and Beaver Creek. Since the Central Big Sioux Watershed Project is addressing the overlapping land in its implementation project it was not included in the Lower Big Sioux River Assessment or Implementation Project.

The Lower Big Sioux River Implementation Project area is divided into five river segments from Brandon, SD to the Mouth near Sioux City, IA (Table 3). All five segments (R-13 through R-17) are impaired due to pathogen levels associated with storm events and high flow conditions.

Table 3: Lower Big Sioux River Implementation Project Reach and Segment Designations.

Segment	Length (Miles)	Description	Mainstem Sites	Tributary Sites (SD)
SD-BS-R-BIG_SIOUX_13	15.8	Above Brandon, SD to Nine Mile Creek (SD)	LBSM01	LBST02
SD-BS-R-BIG_SIOUX_14	33.2	Nine Mile Creek (SD) to near Fairview, SD	LBSM03, LBSM05, LBSM08	LBST04, LBST06, LBST07
SD-BS-R-BIG_SIOUX_15	20	Near Fairview, SD to near Alcester, SD	LBSM08, LBSM09, LBSM13	LBST10, LBST11
SD-BS-R-BIG_SIOUX_16	16.6	Near Alcester, SD to Indian Creek (IA)	LBSM13 LBSM17	LBST12
SD-BS-R-BIG_SIOUX_17	59.9	Indian Creek (IA) to mouth	LBSM17, LBSM19, LBSM20, LBSM21	LBST14, LBST15, LBST16, LBST18

Figure 2: Lower Big Sioux River Project Area

Nonpoint Source Pollutants

Preliminary data from the draft TMDL showed fecal coliform bacteria and total suspended solids in high concentrations for all 5 segments of the Lower Big Sioux River mainstem. The levels increased downstream resulting in nonsupport of immersion recreation, limited contact

recreation and warm water semi permanent fish life propagation. The most likely sources of the impairments were identified as runoff from:

- Confined animal feedlots
- Feeding areas in close proximity to drainages
- Grazing livestock standing in, crossing or heavily grazing riparian areas
- Improper application and handling of manure
- Intense row cropping practices

Information from the watershed assessment conducted in 2002 indicated 178 of the 500 feedlots assessed were rated at or above 50 with the Agricultural Non-Point Source Pollution (AGNPS) Feedlot Module. Project goals established were based on those feedlots with rankings > 50 in the watershed. Geographic Information System Arc-Map was used to further refine the list of operations to target those near or on the major tributaries in the watershed.

A Project Implementation Proposal (PIP) was developed to plan and install BMPs designed to reduce loading into the Lower Big Sioux River. The list of BMPs included:

- Animal waste management system feasibility studies and designs
- Animal waste management system construction
- Nutrient management plans
- Conservation Tillage
- Cropland BMPs
- Grazing Management
- Riparian Restoration

Cost-share funds for installing the practices were provided by the United States Environmental Protection Agency (U.S. EPA) Section 319 Nonpoint Source Pollution Control Grant, the United States Department of Agriculture (USDA) Continuous Conservation Reserve Program (CCRP) and the Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP).

Watershed awareness was also accomplished by information and education (I&E) activities during the project. News articles, post cards, and public meetings were used to inform producers about the project and how it could help them with future BMP planning and installation.

PROJECT OBJECTIVES, TASKS AND ACTIVITIES

Objective 1: Application of BMPs in critical areas to reduce sediment, nutrient and fecal coliform bacteria loading of the Lower Big Sioux River.

Task 1: Plan and Provide assistance for the installation of cropland management BMPs. Assistance to install BMPs on 4,380 acres of cropland will be provided to landowners/operators to reduce sediment and nutrient loads originating from identified critical areas. The BMPs that are planned to be installed include but are not limited to filter strips, grassed waterways, conservation tillage, CRP grass seeding, terrace, and wetland restorations.

Product 1: Terrace restoration on 20,000 linear feet of failing terrace systems. Provide assistance to landowners with terrace systems that have exceeded their lifespan or have filled in over time to restore capacity and functionality reducing sediment delivery to watershed. Terraces that have filled in over time that need capacity restored would be cleaned out and graded to their original design specifications. The project will also work with landowners to repair terrace systems damaged by large rain events and wildlife to restore them back to their original state. New terrace systems, re-builds or extensive projects will be directed towards utilization of the existing EQIP program for funding since they did not fall within the definition of the restoration project. Over the two years of the implementation project, the terrace restoration project will restore and repair 20,000 linear feet of failing and damaged terraces that may not be a good fit for the EQIP program reducing nutrient and sediment transport on 800 acres in the watershed. RUSLE2 calculations indicate an 8,000 ton sediment reduction per year can be accomplished from properly restored terrace systems and conservation tillage. Technical assistance will be provided by the project coordinator and NRCS to determine eligibility of terrace restoration projects. Federal 319 funding and landowner matching funds will be used for implementation of the following activity.

Milestones:	**Planned**	**Completed**
Terrace Restoration	20,000 LF	43,363 LF

Accomplishment: A new pilot terrace restoration program was drafted in collaboration with DENR and NRCS in order to help rekindle awareness and interest in maintaining and restoring damaged terraces in the loess hills of the watershed. Since this portion of the watershed was impaired for TSS, conservation practices reducing sediment transport would help reach the TMDL. A recent study conducted in the Missouri River Basin by the USDA has shown that conservation practices including terraces and reducing tillage could reduce sediment by 76 percent, nitrogen by 54 percent and phosphorus by 60 percent (see Appendix A). The Environmental Quality Incentive Program (EQIP) has been used for several years for implementation of terraces but due to budget constraints and changes in the ranking process some smaller projects were not able to get funded. So it was decided that a terrace restoration program would be developed to fill the gap and help restore damaged and failing terrace systems that had exceeded their lifespan to their original condition. An application was drafted and an advertisement was placed in a local newspaper in order to increase awareness of the new

program. Several producers expressed interest in the program and filled out applications. Once an application was filled out with information related to the location and scope of the work, field verification was used to determine if the site would be a fit for the restoration program. If it was determined that any project would not fit within the requirements of the restoration program, the producer was contacted and urged to sign an EQIP application for possible funding and continued planning. If the site was a fit for the program the producer was contacted and the damaged portions of the terrace lines were flagged and GPS mapped. Producers were in charge of soliciting bids for the terrace restoration work to be done. A preconstruction meeting was conducted on site to discuss the scope of the project so that the contractor and producer were agreeable to the repairs. After construction was complete the repaired portions of the terrace lines were measured and GPS mapped to confirm the linear feet of work done. A conservation plan and contract were developed and signed by the producer in order to process the cost share. Minimum till or no till practices were written into the plan to be adopted by the land owner on the fields with the restored terraces in order to maximize the lifespan of the practice. Cost share was based on linear feet of repaired terraces and was capped at 78 cents per foot. The two most common types of terraces qualifying for the restoration project were pushup and farmable terrace systems. Failing systems mainly resulted from wildlife burrowing into the terraces causing failure of water holding capacity which in turn damaged the successive terrace lines down slope. Figure 3 shows terrace damage and construction process to fix them.

Figure 3: Terrace Restoration Project

Product 2: Conservation tillage on 2,800 acres of cropland.
Technical assistance will be provided to landowners/operators to encourage the adoption of conservation tillage (no-till, reduced-till, etc.) through educational outreach activities. Technical assistance will be provided by the project coordinator in partnership with NRCS, the SDSU Cooperative Extension Service, area conservation tillage farmers, and conservation district staff.

Milestones:	**Planned**	**Completed**
Conservation Tillage	2,800 ac.	3,171.7 ac.
Fertilizer Application Workshops	2	0

Accomplishment: Conservation tillage has been implemented on 3,171.7 acres of cropland by several producers in the watershed. Tillage operations were converted from conventional tillage and minimal tillage to minimal tillage and no-till and/or conservation crop rotation. Conservation plans were written to adopt conservation tillage and tied to practices implemented in order to be eligible for cost share. A majority of conservation tillage was implemented on fields associated with terrace restoration and nutrient management plans. Heavy residue left in the field from no-till farming to reduce soil displacement is shown in Figure 4.

Figure 4: Residue Remaining after No-Till Farming

Product 3: Perennial vegetation on 700 acres of cropland.
Technical and financial assistance was provided to landowners/operators to plant erodible cropland to a grass/alfalfa, native, or a native and introduced grass and forbs seed mix. Funds for BMP installation were provided by state and federal wildlife conservation agency programs, state conservation programs, and USDA conservation programs (CRP, EQIP, etc.)

Milestones:	**Planned**	**Completed**
Grassland established on cropland	700 ac.	219.6 ac.

Accomplishment: Technical assistance was provided to several producers with CRP contracts for native grass establishment on cropland. Practices consisted of CRP SAFE pheasant habitat, quail habitat, wetland buffers, filter-strips and grass waterways. Conservation plans were written to protect sensitive areas near wetlands and drainages with conservation tillage planned for the cropland remaining in production.

Product 4: Forty (40) acres of filter strips and 27,500 linear feet of grassed waterways on cropland.
BMPs installed were funded by the landowner/operator, USDA conservation programs (EQIP and CRP) and by state conservation programs.

Milestones:	**Planned**	**Completed**
Filter Strips	40 ac.	76.7 ac.
Grassed Waterways	27,500 L.F.	11,670 L.F.

Accomplishment: Technical assistance, planning and surveying was provided to 10 producers for construction of grass waterways and filter strips. Producers constructed 11,670 linear feet of grass waterways on 16 acres of cropland and 76.7 acres of filter strips adjacent to over 7,000 linear feet of streams and wetlands. Twenty two acres of wetlands were also restored with floodplain and non-floodplain wetland CRP practices. Pictures of a waterway project from impaired conditions to constructed and planted to grass can be seen in Figures 5 & 6.

Figure 5: Classic Gully Erosion Pre-Construction

Figure 6: Constructed Grass Waterway

Task 2: Provide assistance to landowners to install BMPs on 1,000 acres of grassland

Grassland BMPs would be installed to reduce fecal coliform bacteria, nutrient, and sediment loading by reducing runoff, and improving stream banks and riparian area vegetation. The BMPs included but were not limited to rotational grazing systems, riparian management, riparian buffers, riparian land use agreements, and stream bank/shoreline stabilization.

Product 5 & 6: Grassland Management on 500 acres of pasture and 500 acres of riparian.

The implementation of rotational grazing systems on grasslands and riparian areas required the installation of practices that supported the landowners change in grazing management and included: livestock water developments (pipelines, tanks, rural water hook-ups, wells, ponds, dugouts, fencing, etc.). Technical assistance for grassland BMP installation would be requested from the SD Grassland Planning and Implementation Project, Cooperative Extension Service and NRCS Field Offices if needed. Practices installed would be funded by the landowner with assistance from South Dakota and Federal conservation and wildlife programs (Game Fish and Parks, U.S. Fish and Wildlife Service Private Land Programs, etc.) and USDA conservation programs (CCRP, EQIP).

Milestones:	**Planned**	**Completed**
Rotational Grazing Systems	500 ac.	153.9 ac.
Rotational Grazing on Riparian	500 ac.	5.7 ac.
Fencing	5,000 L.F.	3,054 L.F.
Pipelines	5,000 L.F.	0 L.F.
Tanks	4	0
Rural Water Hook-ups	2	0

Accomplishment: Segment 1 of this project had a producer start a plan for a rotational grazing system with cross fencing, dam and water tanks with pumps. Since the EQIP contract was scheduled over 3 years, the cross fencing and dam construction were completed during this segment of the project.

Also installed was a riparian buffer on 5.7 acres along a drainage that was part of the landowners watering facility. A dam was reconstructed to provide water throughout the grazing system with future plans to complete pipelines that would convey the water to the various paddocks of the rotational grazing system. The landowner opted to exclude all livestock from the riparian area in order to keep the integrity of the newly constructed dam. A sequence of photos (Figures 7) shows the dam in its original state to the finished product.

This producer is currently in the planning process to change his grazing system on an additional 140 acres of pasture along the Big Sioux River. The goal of the rotational grazing system is to better utilize forage produced throughout the system and distribute grazing more effectively.

Figure 7: Riparian Dam Reconstruction

Task 3: Provide assistance to landowners to complete four (4) animal waste management system feasibility studies and designs to provide landowners information for implementing systems that meet their business needs and reduce fecal coliform and nutrient transfer to water bodies.

Product 7: Four (4) AWMS feasibility studies, system designs, nutrient management plans and archeological/cultural resource searches.

Assistance was provided along with private consultants and/or the Animal Nutrient Management Team to complete feasibility studies, nutrient management plans and designs based on a priority evaluation and ranking by from the watershed assessment project information. Cultural resource investigations were conducted by the watershed coordinator and NRCS personnel for operations planning for animal waste management systems. Funding for cultural resource studies was available to landowners that would have needed additional archeological investigations to follow requirements of federal cost-share regulations.

Milestones: (Waste Storage Facilities)	**Planned**	**Completed**
Feasibility Studies	4	2
Designs	4	2
Nutrient Management Plans	4	1

Accomplishment: Two producers had feasibility studies completed in Segment 1, and were revisited several times during Segment 2 but decided that they were not willing to continue with designing and construction of waste management systems. Two new feasibility studies and designs were completed during Segment 2 along with 1 nutrient management plan. Both of the producers applied for EQIP funding and one was accepted to be funded. Due to issues that arose after becoming eligible for funding both operators decided to defer their applications. Planning is still being continued with both producers and they will be applying for EQIP funding for next year. Since the design and nutrient plans will be completed by the next application round, both operations stand a good chance to get funded through EQIP and the 319 project.

Product 8: Construction of (4) animal waste management systems.
Installation of (4) animal waste management systems (AWMS) are planned to be constructed by livestock producers. Funding for the AWMS will be from this project's 319 funds, State Consolidated Funds, Landowners and the NRCS EQIP program. Three of the AWMS are anticipated to be conventional full containment systems and one is anticipated to be an Alternative Technology Vegetative Treatment System (VTS). The VTS will involve an agreement with the owner/operator that includes a nutrient management plan and will follow NRCS and SDSU guidelines and recommendations.

Milestones: (Waste Storage Facilities)	**Planned**	**Completed**
Construction	4	0

Accomplishment: No systems were completed during segment 2 of the project. The general atmosphere of the producers in the area seems to be a wait and see approach since there is nothing forcing the issue of manure containment and management. Several producers have been contacted to begin planning for waste storage facilities throughout the watershed but there has not been much interest. The two producers that have completed feasibility studies and designs deferred their applications until the next application round due to situations that arose during the application process. The applications will be submitted again for the next round with hopes of getting ranked and funded so construction can begin next year.

Objective 2: Provide BMP and project information to 300 watershed residents, landowners, and members of stakeholder organizations to inform them on project activities and BMP installation, and to maintain local support and involvement.

Task 4: Implement an Information and Education campaign to inform landowners and stakeholders on project need and progress, results and recommendations of the TMDL Reports.

Products 9: Information and Education through SDACD website, newsletters (2), presentations (2), and press releases (2) for watershed residents.
The Lincoln Conservation District and its project partners would produce two newsletters and two press releases, establish and maintain a project web site, and make two presentations that inform project area residents of the Lower Big Sioux River Watershed Project. Activities led by the project coordinator and are listed below:

Milestones:	**Planned**	**Completed**
Web Site developed and maintained for two years	1	1
Newsletters	2	1
Project information presentations	2	1
News releases to local/area media	3	3

Accomplishment: The SDACD website had previously been developed to allow watershed residents internet access to the watershed project site and personnel contact information for assistance with watershed programs. It is currently undergoing construction and should be online soon. The link to the SDACD home page is: http://sdconservation.site-ym.com During Segment 2 of the project, one newsletter article was written and placed on the Conservation District newsletter that is circulated biannually. One project presentation was given to watershed residents in the Alcester auditorium. The Alcester Manure Management Meeting was advertised to the public through posters, radio spots on WNAX and an ad in the local newspaper. One article about the terrace restoration project was released in the Akron Hometowner and the Alcester Union & Hudsonite newspapers. Also an interview was done for an article on the Big Sioux River in the Argus Leader. Some of the information and education outreach for this project can be found in Appendix B

Objective 3: Continued Watershed Monitoring Activities.

Task 5: Bank Erosion Sheer Testing Equipment and Analysis.

Product 10: Purchase of Sheer Testers (2), Jet Testers (2), Auger/Rods/Case (2), Data Collection and Sample Analysis.
The Lincoln Conservation District will purchase bank stability equipment to sample the Lower Big Sioux River 5 segments.

Milestones:	**Planned**	**Completed**
Purchase Sheer Testers/Rods/Cases	2	2
Purchase Jet Tester	2	0
Purchase Auger/Rods/Case	1	0
Sample/Data Collection	10	0
Sample Analysis	10	0

Accomplishment: Sheer testers, rods and cases were purchased through the project while the auger and jet tester were borrowed from the Agricultural Research Service (ARS). The equipment was used to collect data on the Central Big Sioux River and Skunk Creek north of Sioux Falls to complete the data collection needed for the bank stability project already in progress for that watershed. Since the equipment was used in the Central Big Sioux Watershed, there was not enough time in the sampling season to start work in the Lower Big Sioux Watershed. The DENR did start and complete the geomorphic stream assessment of the Lower Big Sioux River to determine the percent of failing banks. Potential sites have been located for the sheer testing and are slated to start in the fall of 2013.

Objective 4: Monitor, Evaluate and Report Project Progress.

Task 6: Complete activities required to monitor, evaluate and report project progress and success.
Reports describing project activities as required by the South Dakota Department of Environment and Natural Resources; and participating agencies and associations have been prepared and submitted.

Product 11: Semiannual, annual, monthly and final project reports and Segment 3 PIP development.
Semiannual (2 each):

Since the overall project remained on schedule, semiannual reports were not required.

Annual (3 reports during October 2010, 2011 and 2012):

The annual reports were submitted to DENR in a format that met the GRTS reporting requirements. The reports included information on:

- Estimated load reductions for BMPs installed using STEPL; and
- Pollutant reductions in respect to each TMDL river segment.

Monthly progress reports were submitted to the project sponsor. These were submitted electronically or in written form by the Project Coordinator at monthly board meetings.

Milestones: (Waste Storage Facilities)	**Planned**	**Completed**
Semiannual reports	2	0
Annual reports	2	3
Monthly reports	24	24
Final Report	1	1

Accomplishment: All reports have been completed and submitted for Segment 2 of the Lower Big Sioux River Watershed Implementation Project. The final project report was completed using a format provided by DENR.

Summary of Project Goals and Objectives

Table 4: Planned Versus Completed Project Milestones.

OBJECTIVES / TASKS/ PRODUCTS	PLANNED MILESTONES	COMPLETED MILESTONES
Objective 1 - Task 1		
Cropland BMPs		
Terrace Restoration	20,000 L.F.	43,363 L.F.
Conservation Tillage	2,800 ac.	3,172 ac.
CRP Perennial Vegetation	700 ac.	219.6 ac.
Filter Strips	40 ac.	76.7 ac.
Grass Waterways	27,500 L.F.	11,670 L.F.
Objective 1 – Task 2		
Grassland BMPs		
Rotational Grazing Systems	500 ac.	154 ac.
Fencing	2,500 L.F.	3,054 L.F.
Pipelines	2,500 L.F.	0 L.F.
Tanks	2	0
Water Hookups	1	0
Objective 1 - Task 2		
Riparian Area Grassland BMPs		
Rotational Grazing Systems	500 ac.	6 ac.
Fencing	1,500 ac.	0
Pipelines	9,000 L.F.	0
Tanks	5	0
Rural Water Hookups	2	0
Objective 2 - Task 4		
Waste Storage Facilities		
Feasibility Studies	4	2
Engineering Designs	4	1
Cultural Resources Reviews	4	1
Nutrient Management Plans	4	1
AWMS Construction	4	0
Objective 3 - Task 5		
Informational Outreach		

Website Maintenance	1	1
Newsletters	2	1
Presentations	2	1
News Releases	3	3
Objective 4 - Task 6		
Project Reports		
Monthly	24	24
Semi-annual	2	0
Annual	2	3
Final	1	1

MONITORING RESULTS

Stream water quality monitoring for the Lower Big Sioux River mainstem will continue through SD DENR's ambient water quality monitoring stations throughout the river basin especially for: Segment R14 (WQM 65) above Canton, Segment R15 - Site LBSM09 (WQM66) at Hudson, SD, Segment R16 - Site LBSM13 (WQM67) at Hawarden, IA, and Segment R17 – Site LBSM19 (WQM32) at Richland, SD. These stations are sampled on a monthly basis, and locations can be found on the map in Figure 5 below.

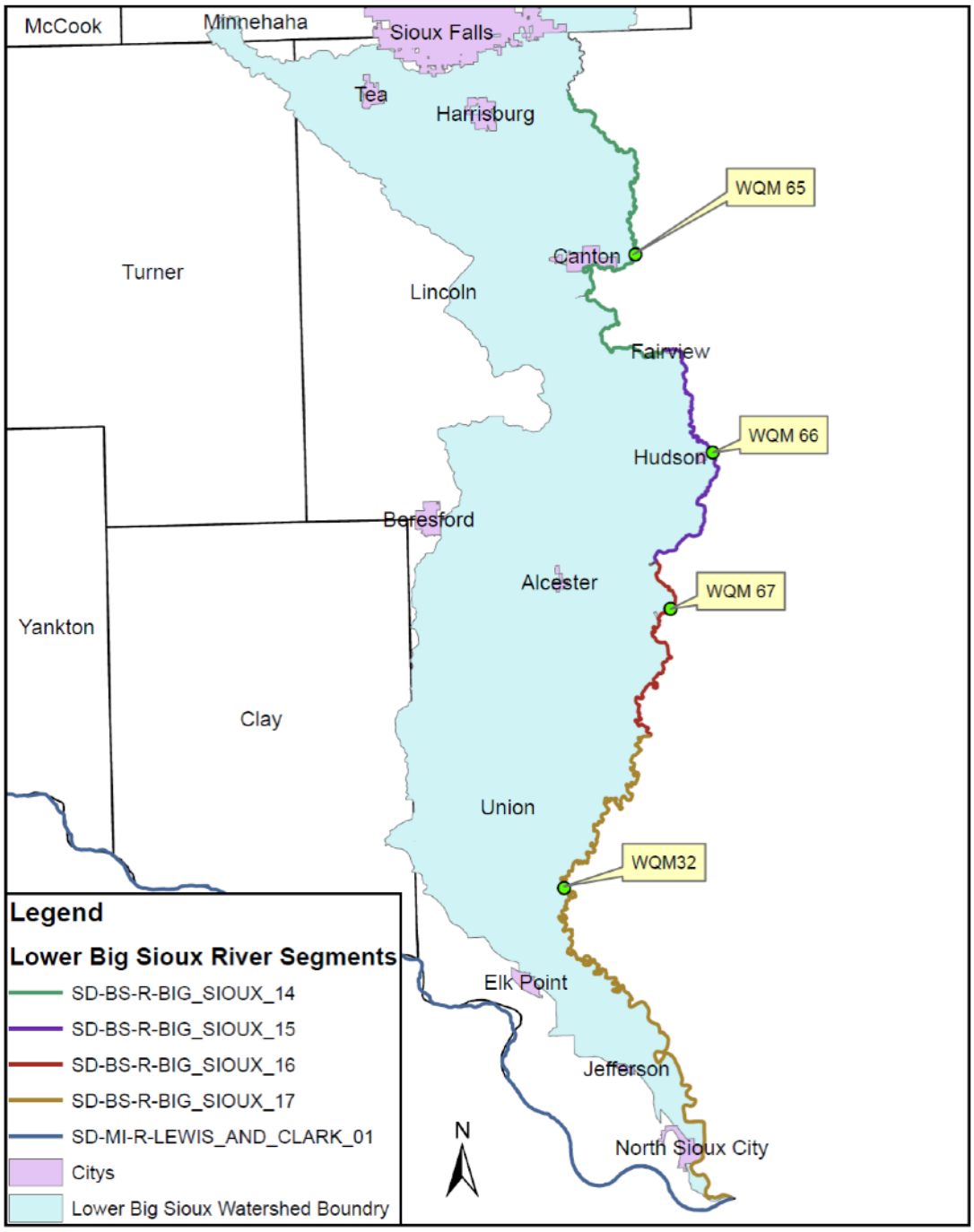


Figure 5: South Dakota Ambient WQM Sites in the Lower Big Sioux Project Area

Starting sometime during 2010, radars were installed at the WQM sites to asiste in colecting flow data along with sample data. This flow data along with sample data were used to calculate the "Samples 2011-2012" loads for each segment can be seen in the tables below. Some sites had few to no samples taken for certine flow regimes (number of samples colleced for the given flow regime and parameter are also listed in the tables below). The "TMDL" and "Samples Assesment" come from the asessments that were completed by DENR and RESPEC. The reports can be found at http://denr.sd.gov/dfta/wp/tmdlpage.aspx#Big Sioux.

Fecal and E. coli are both in Colony Forming Units (CFUs) per day, and Total Suspended Solids (TSS) are in tons per day. Most of the samples show a downward trend for the paramters, with a few increases in the high flow regime for all sample locations (see Tables 5 -8). More sampling needs to be completed inorder to have a better comparison with the loads dirved in the TMDLs.

Table 5: WQM 65 TMDL and Sample Data.

Flow Regime	High		Moist		Mid		Low	
Polutatnt Type	Fecal	E. coli	Fecal	E. coli	Fecal	E. coli	Fecal	E. coli
TMDL	2.3E+13	1.4E+13	6.0E+12	3.5E+13	2.5E+12	1.4E+12	1.1E+12	6.5E+11
Samples Assessment	3.2E+13	1.9E+13	3.3E+12	2.0E+12	3.1E+11	1.8E+11	1.2E+11	7.3E+10
Samples 2011-2012	1.4E+14	1.4E+13	1.2E+11	4.4E+11			3.0E+10	4.7E+10
Samples Collected	6	4	1	2	0	0	1	2
Reductions	-1.1E+14	5.4E+12	3.2E+12	1.5E+12			9.4E+10	2.6E+10

Table 6: WQM 66 TMDL and Sample Data.

Flow Regime	High			Moist			Mid			Low		
Polutatnt Type	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS
TMDL	2.3E+13	1.4E+13	4,994	6.0E+12	3.5E+12	529	2.5E+12	1.4E+12	197	1.1E+12	6.5E+11	84
Samples Assessment	3.2E+13	1.9E+13	4,813	3.3E+12	2.0E+12	663	3.1E+11	1.8E+11	193	1.2E+11	7.3E+10	75
Samples 2011-2012	5.7E+13	1.4E+14	2,382	5.4E+11	4.3E+11	163				4.4E+10	1.3E+10	46
Samples Collected	6	6	11	2	2	9	0	0	0	2	2	2
Reductions	-2.5E+13	-1.2E+14	2,431	2.8E+12	1.5E+12	500				8.0E+10	6.0E+10	29

Table 7: WQM 67 TMDL and Sample Data.

Flow Regime	High			Moist			Mid			Low		
Polutatnt Type	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS
TMDL	2.3E+13	1.4E+13	5,611	6.0E+12	3.5E+12	5,611	2.5E+12	1.4E+12	263	1.1E+12	6.5E+11	84
Samples Assessment	3.2E+13	1.9E+13	5,503	3.3E+12	2.0E+12	4,560	3.1E+11	1.8E+11	199	1.2E+11	7.3E+10	79
Samples 2011-2012	1.9E+14	3.5E+14	3,827	4.4E+11	6.9E+11	404		7.7E+10	126			20
Samples Collected	3	3	8	1	1	3	0	1	1	0	0	0
Reductions	-1.5E+14	-3.3E+14	1,677	2.9E+12	1.3E+12	4,156		1.1E+11	73			58

Table 8: WQM 32 TMDL and Sample Data.

Flow Regime	High			Moist			Mid			Low		
Polutatnt Type	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS	Fecal	E. coli	TSS
TMDL	3.1E+13	1.8E+13	760	9.9E+12	5.8E+12	247	4.1E+12	2.4E+12	101	1.1E+12	6.7E+11	28
Samples Assessment	2.5E+14	1.5E+14	2,286	4.9E+14	2.9E+14	903	1.0E+14	6.0E+13	104	2.4E+11	1.4E+11	30
Samples 2011-2012	1.4E+14	3.2E+14	3,429	7.8E+11	7.6E+11	276						
Samples Collected	5	6	13	3	4	10	0	0	0	0	0	0
Reductions	1.1E+14	-1.8E+14	-1,143	4.9E+14	2.9E+14	627						

Evaluation tools were utilized to measure reductions of non-point sources of pollution for the various BMPs implemented. Pollutant reduction was documented for all project activities. Models such as RUSLE2, STEPL, and the FLGR4 were used to measure the effectiveness of the BMPs and the DENR Tracker system was used to capture load reductions and location in the watershed. The location of these BMPs can be seen in Figure 6 for this project, and in Figure 7 for the combination of this project with the previous segment.

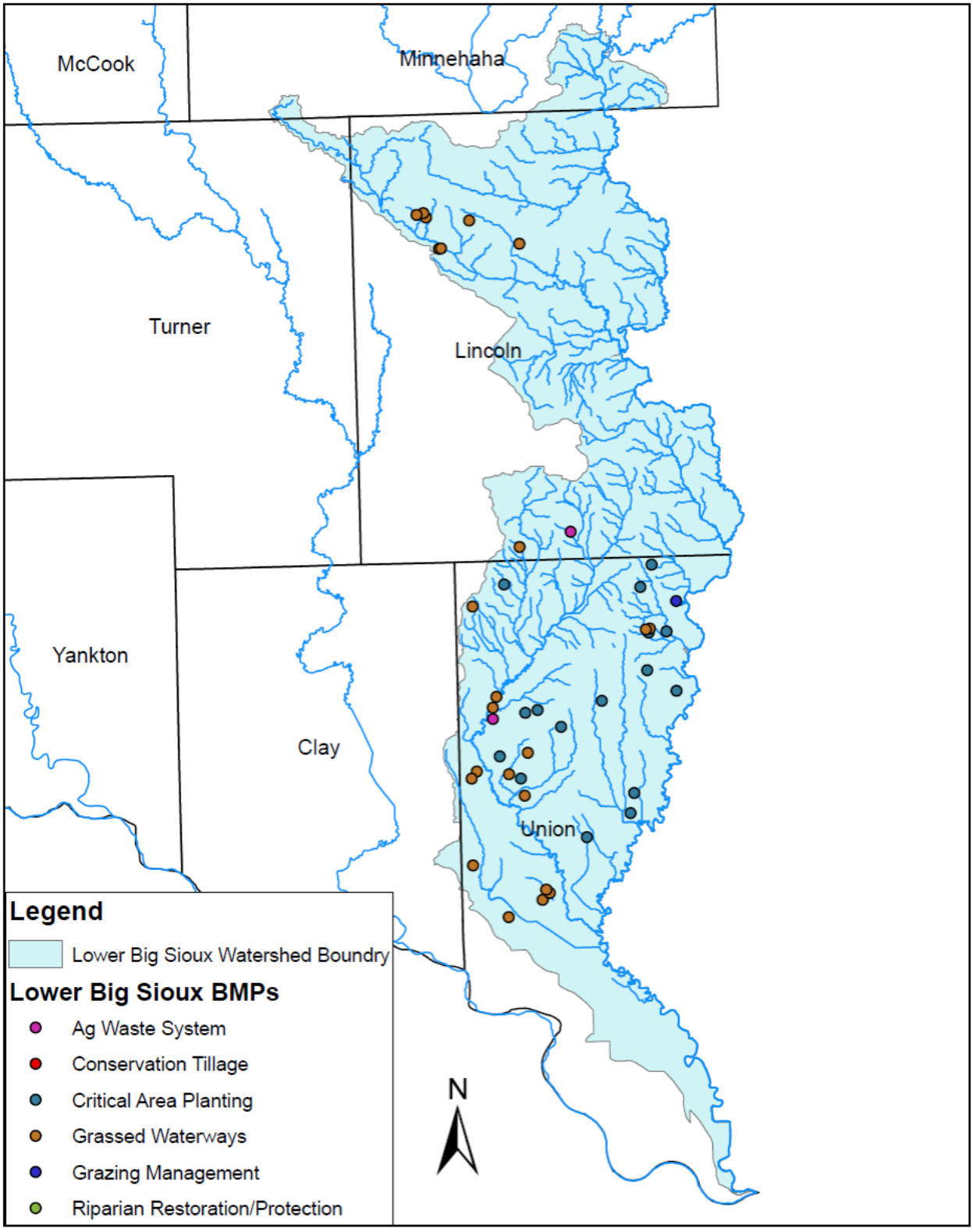


Figure 9: Location of Segment 2 319 Project BMPs

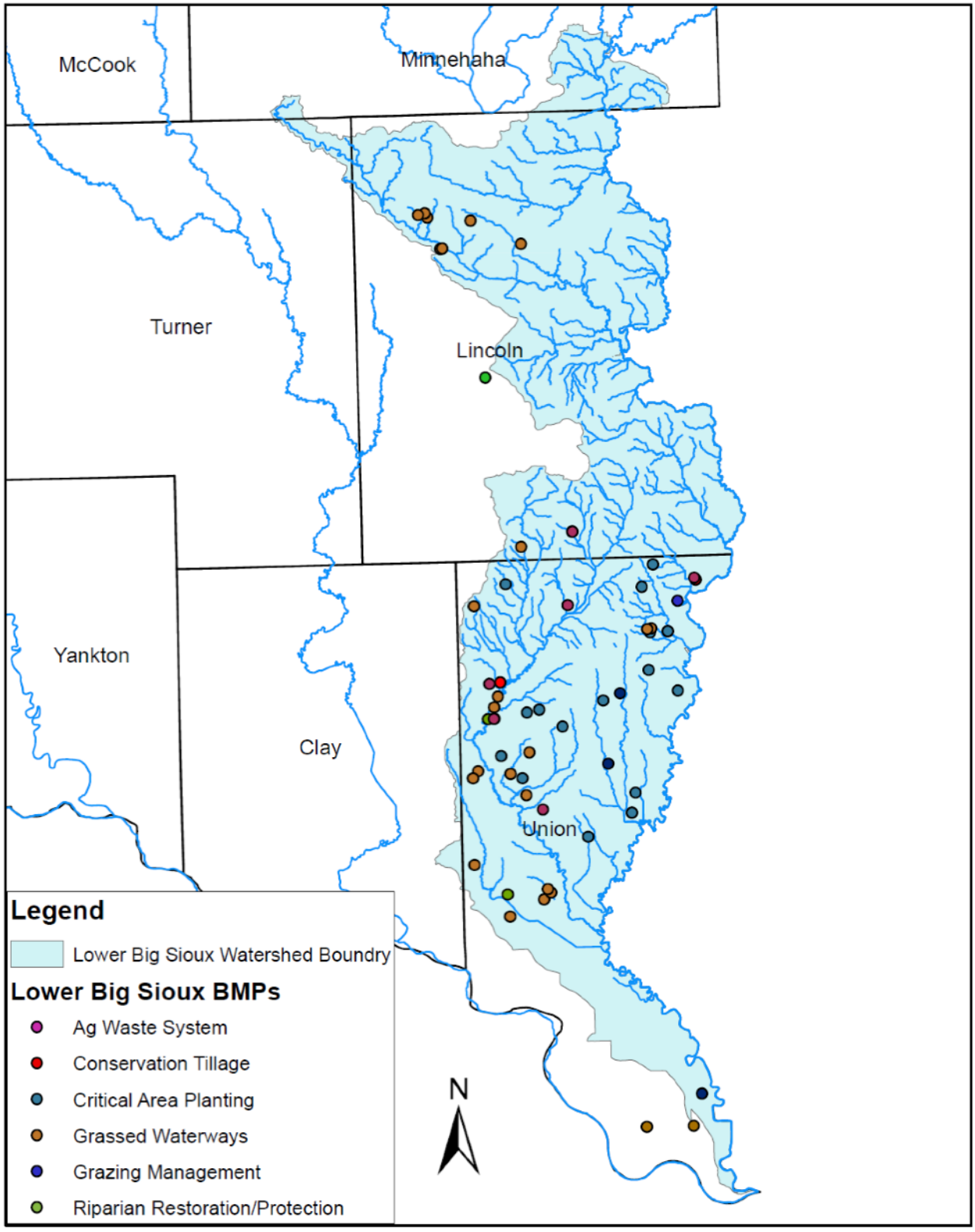


Figure 10: Location of Segment 1 and 2 319 Project BMPs

Load reductions for all BMPs installed in segment 1 and 2 of this project are summarized in Table 9. Since the Tracker program allows the user to map the BMPs relative to their watershed location, load reductions can be summarized for each TMDL water body segment separately as seen in Table 10. All of reductions in Table 10 reflect the first 303d water body the installed BMPs reductions would affect. It does not take into account delivery to that segment, nor the combined effects of BMPs for reaches further downstream.

Table 9: Annual Load Reductions by BMP.

Best Management Practices	N (Pounds)			P (Pounds)			Sediment (Tons)		
	Seg. 1	Seg. 2	Total	Seg. 1	Seg. 2	Total	Seg. 1	Seg. 2	Total
Waste Storage Facility Construction	422		422	741		741	8		8
Riparian Management	1,530		1,530	1,440		1,440	9		9
Cropland Management	13,558	20,364	33,922	4,347	7,791	12,138	3,114	5,785	8,899
Grazing Management		308	308		66	66		43	43
Total Reductions	**15,510**	**20,672**	**36,182**	**6,528**	**7,857**	**14,385**	**3,131**	**5,828**	**8,959**

Table 10: Annual Load Reductions by River Segment.

Lower Big Sioux River Segments	N (Pounds)			P (Pounds)			Sediment (Tons)		
	Seg. 1	Seg. 2	Total	Seg. 1	Seg. 2	Total	Seg. 1	Seg. 2	Total
SD-BS-R-BEAVER_01		1,385	1,385		572	572		392	392
SD-BS-R-BIG_DITCH_TRIB_01		163	163		57	57		42	42
SD-BS-R-BIG_SIOUX_15	2,428	1,715	4,143	800	620	1,420	594	459	1,053
SD-BS-R-BIG_SIOUX_16		4,198	4,198		1,631	1,631		1,220	1,220
SD-BS-R-BIG_SIOUX_17	463	1,185	1,648	124	443	567	81	332	413
SD-BS-R-BRULE_01	7,848	9,431	17,279	3,457	3,514	6,971	1,476	2,613	4,089
SD-BS-R-EAST_BRULE_01	422		422	741		741	8		8
SD-BS-R-UNION_01	2,416	2,595	5,011	771	1,020	1,791	525	770	1,295
Missouri River	749		749	252		252	182		182
Undefined	1,184		1,184	383		383	265		265
Total Reductions	**15,510**	**20,672**	**36,182**	**6,528**	**7,857**	**14,385**	**3,131**	**5,828**	**8,959**

COORDINATION EFFORTS

The Lincoln Conservation District was the lead sponsor of the Lower Big Sioux River Watershed Project. The district manager and board of directors provided input and direction for the project through monthly meetings and serving on the steering committee. Federal, state, local agencies and organizations contributed funds, technical services, cash and in kind match to accomplish goals of the project (Table 9). The agencies and their roles are summarized below.

Lincoln and Union Conservation Districts

The Lincoln Conservation District agreed to be the lead project sponsor and entered into a joint agreement with the Union Conservation District to co-sponsor the project. Both counties supported the project by appointing members to serve on the steering committee and allowing the project coordinator access to landowner information through their offices. The Lincoln Conservation District set aside time during each board meeting to approve project implementation activities and funds being spent. The office manager assisted the project coordinator with cost-share reimbursement, file maintenance and other financial transactions.

South Dakota Department of Environment and Natural Resources

The South Dakota Department of Environment and Natural Resources (SDDENR) administered the U.S. EPA Section 319 grant and provided oversight of all project activities. Project administration included on-site office visits, watershed tours, review of reports, approval of payment requests, and attendance of steering committee meetings. Training workshops and meetings were sponsored by the SDDENR to keep the watershed coordinator current with implementation activities and funding procedures. A project officer was appointed to the project to assist in managing funds, setting up and maintaining the Tracker system and reviewing all implementation activities and reporting.

United States Department of Agriculture – Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) provided technical assistance for the planning, design and installation of conservation practices. Personnel included: District Conservationists from Lincoln and Union County field offices; a Soil Conservation Technician from the Union County office; a Civil Engineering Technician from the Minnehaha County office; a Resource Conservation Development Coordinator from the Mitchell South Dakota Service Center. A workspace was rented from the NRCS and software licenses were paid for through the project. Access to the NRCS system enabled the watershed coordinator to generate conservation plans, contracts and maps for BMP implementation activities. Programs utilized, but not limited to, included the USDA's Environmental Quality Incentives Program (EQIP), and Conservation Reserve Program (CRP) administered through the Farm Service Agency (FSA).

South Dakota Association of Conservation Districts

The SDACD provided budgetary administration of salary funding for the watershed coordinator. One half of the coordinator salary administered for the project was generated from the statewide 303d watershed project and Farm Bill Implementation Technical Assistance fund. These funds

were specifically used for projects either outside of the watershed or projects not listed in the Project Implementation Proposal in order to expand the suite of BMPs offered.

United Stated Environmental Protection Agency

The United States Environmental Protection Agency provided the Clean Water Act Section 319 Grant which was the primary funding source of the project. EPA officials from the Region 8 office in Denver, Colorado participated in one on-site tour and review of the project.

PUBLIC PARTICIPATION

The public was notified of opportunities to participate in the project through press releases, newsletters, meetings to inform and educate them about the project. Watershed residents were given a presentation of the project, its goals, and funding opportunities for Implementation activities in the watershed. A majority of the attendants were agricultural producers with a few in town property owners and sportsmen.

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL

The milestones for implementing 4 waste storage facilities, 1,500 acres of Rotational Grazing Systems and 500 acres of Riparian Buffers fell behind during this segment of the project. Two of the producers that had feasibility reports completed early in segment 1 of the project decided that it was too expensive to implement the practice and didn't want to invest in an AWMS at the time. Two other producers planning for an animal waste storage facility completed design and applied for EQIP funding. One was eligible for funding but had a situation arise that resulted in the application deferment. This application will be submitted again for the next funding round with hopes of construction in 2014. The other applicant was still unsure of the type of system that would work for the operation so the application was deferred as well. Several other producers that were contacted were not very receptive to change the way they have been operating since it was working for them and they may not be operating it much longer. They thought it would not be a good investment since they did not have anyone planning to take over the operation in their family after they retired.

Grazing systems and riparian buffers have not been easy programs to promote. This may have been caused by the makeup of the riparian areas and landscape altogether. Since a large percentage of the land use is intensive row crop, the small riparian areas that exist are highly sought after for stock cow/calf operations. Due to the geographic nature of the watershed, those areas tend to be slender tracts of undeveloped pasture and are heavily utilized for that reason. In many cases, buffering out the stream would essentially remove a majority of the grazing land available to the livestock. Implementing rotational grazing systems on the remaining portion of the pasture was perceived as extra time and work that would not be worthwhile for the small areas.

A few larger tracts remain along riparian areas that are used for grazing. In future segments of the watershed project, producers with pasture and cropland along riparian areas should continue to be contacted to plan for BMPs. There is interest to enroll cropland into filter strips and buffers, but pasture practices remained a difficult sell.

PROJECT BUDGET

Table 11: Lower Big Sioux River Implementation Project Segment 2 Original Budget.

ITEM	319-EPA	Cons. Comm.	CWFC	USDA	SD GF&P	Local	Total
Personnel Support							
Project Coordinator	$102,588						$101,389
Travel:	$17,832						$19,031
Administration:	$6,044					3000	$9,044
SDACD Contract Management	$13,906						$13,906
Computer Support:	$2,880						$2,880
Subtotal: Personnel Support	**$143,250**	**$0**	**$0**	**$0**	**$0**	**$3,000**	**$146,250**
Objective 1: Best Management Practice (BMP) Implementation							
Task 1: Cropland BMPs (4,380 acres)							
Product 1: Terrace Restoration - 20,000 LF. @ $1.05/LF.	$15,750					$5,250	$21,000
Product 2: Conservation Tillage - 2,800 acres @ $0.00/ac.							
Product 3: Perennial Vegetation: 700ac.@ $100/ac.				$35,000	$17,500	$17,500	$70,000
Product 4: Filter Strips & Grassed Waterways (27,500 LF.)							
Filter Strips - 40 ac. @ $100/ac.				$3,000		$1,000	$4,000
Grassed Waterways - (40 ac.) 27,500 LF. @ $1.70/LF.				$37,400		$9,350	$46,750
Task 2: Grassland BMPs (1,000 acres)							
Product 5: Grassland Management (500 ac.)							
Rotational Grazing Systems: 500 ac. @ $0.00							
Fencing: 2,500 LF @ $1/LF					$1,250	$1,250	$2,500
Water Developments:		$3,842				$5,958	$9,800
Product 6: Riparian Area Grassland Management (500 ac.)							
Rotational Grazing Systems: 500 ac. @ $0.00							
Fencing: 2,500 LF @ $1/LF					$1,250	$1,250	$2,500
Water Developments:		$4,275				$4,275	$8,550
Task 3: Animal Waste Management Systems (AWMS)							
Products 7: Feasibility Studies/Designs/Nutrient Plans	$55,200	$0	$13,800	$0	$0	$23,000	$92,000
Products 8: AWMS Construction							
Conventional AWMS Construction 3 @ $175,000 each	$116,800		$63,200	$240,000		$105,000	$525,000
Vegetated Treatment System @ $60,000 each	$36,000		$9,000.00			$15,000.00	$60,000
Subtotal: BMP Implementation	**$223,750**	**$8,117**	**$86,000**	**$315,400**	**$20,000**	**$188,833**	**$842,100**
Objective 2: Informational Outreach							
Task 4: Information Campaign (300 watershed residents)							
Products 9: Web Site, Newsletters, Presentations and Press Releases							
Web Site: With SDACD: Maintenance Costs	$2,000						$2,000
Newsletters: 2 mailings (1,000 each @ $.50/piece)	$1,000						$1,000
Subtotal: Informational Outreach	**$3,000**					.	**$3,000**
Objective 3: Watershed Monitoring							
Task 5: Bank Erosion Sheer Testing Equipment and Sampling							
Products 10: Sample Analysis	$30,000						$500
Subtotal: Watershed Monitoring	**$30,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$500**
Total Project Cost:	**$400,000**	**$8,117**	**$86,000**	**$315,400**	**$20,000**	**$191,833**	**$1,021,350**
Match:							
Ineligible Match - Federal and/or Project Allocated				$315,400			$315,400
Match: Project Totals For Match	$400,000	$8,117	$86,000		$20,000	$191,833	$705,950
Match Percentages:	**57%**	**1%**	**12%**	**0%**	**3%**	**27%**	

PROJECT BUDGET

Table 12: Lower Big Sioux River Implementation Project Segment 2 Actual Budget.

ITEM	319-EPA	Cons. Comm.	CWFC	USDA	SD GF&P	Local	Total
Personnel Support							
Project Coordinator	$41,998.98						$41,998.98
Travel:	$15,895.48						$15,895.48
Administration:	$592.15						$592.15
SDACD Contract Management	$3,131.07						$3,131.07
Computer Support:	$0.00						$0.00
Monitoring: Shear Testing Equipment	$25,633.74						$25,633.74
Subtotal: Personnel Support	**$87,251.42**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$87,251.42**
Objective 1: Best Management Practice (BMP) Implementation							
Task 1: Cropland BMPs (4,380 acres)							
Product 1: Terrace Restoration - 20,000 LF. @ $1.05/LF.	$9,524.74			$38,670.20		$37,791.42	$85,986.36
Product 2: Conservation Tillage - 2,800 acres @ $0.00/ac.							
Product 3: Perennial Vegetation: 700ac.@ $100/ac.				$10,614.00		$16,437.30	$27,051.30
Product 4: Filter Strips & Grassed Waterways (27,500 LF.)							
Filter Strips - 40 ac. @ $100/ac.				$1,058.00		$1,296.86	$2,354.86
Grassed Waterways - (40 ac.) 27,500 LF. @ $1.70/LF.				$9,049.87		$3,577.82	$12,627.69
Task 2: Grassland BMPs (1,000 acres)							
Product 5/6: Grassland/Riparian Management							
Rotational Grazing Systems: 1,000 ac.							
Fencing: 5,000 LF @ $1/LF						$5,709.00	$5,709.00
Water Developments:				$17,600.00		$26,031.42	$43,631.42
Task 3: Animal Waste Management Systems (AWMS)							
Products 7: Feasibility Studies/Designs/Nutrient Plans	$12,985.59			$18,500.00		$4,309.81	$35,795.40
Products 8: AWMS Construction							
Conventional AWMS Construction 3 @ $140,000 each							
Vegetated Treatment System @ $60,000 each							
Subtotal: BMP Implementation	**$22,510.33**	**$0.00**	**$0.00**	**$95,492.07**	**$0.00**	**$95,153.63**	**$213,156.03**
Objective 2: Informational Outreach							
Task 4: Information Campaign (300 watershed residents)							
Products 9: Web Site, Newsletters, Presentations and Press Releases							
Web Site: With SDACD: Maintenance Costs	$0.00						
Newsletters: 2 mailings (1,000 each @ $.50/piece)	$0.00						
Subtotal: Informational Outreach	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Objective 3: Watershed Monitoring							
Task 5: Bank Erosion Sheer Testing Equipment and Sampling							
Products 10: Sample Analysis							
Subtotal: Watershed Monitoring	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Total Project Cost:	**$109,761.75**	**$0.00**	**$0.00**	**$95,492.07**	**$0.00**	**$95,153.63**	**$300,407.45**
Match:							
Ineligible Match - Federal and/or Project Allocated				$95,492.07			$95,492
Match: Project Totals For Match	$109,761.75	$0.00	$0.00		$0.00	$95,153.63	$204,915
Match Percentages:	**54%**	**0%**	**0%**	**0%**	**0%**	**46%**	

FUTURE ACTIVITY RECOMMENDATIONS

In August 2012 the Lower Big Sioux Segment 2 Watershed Project was merged with the Central Big Sioux River Segment 2 Implementation Project. The watershed Project Implementation Proposal was completed, reviewed and accepted in September 2012. The logical decision to merge the two watershed projects was based in part on geographic location, funding and personnel restructuring. The milestones, budget and BMPs were combined to satisfy the load reductions needed and fulfill the TMDLs set for the Central and Lower Big Sioux River Watersheds. The combination of the two projects resulted in the Central Big Sioux River Watershed Implementation Project Segment 2. The Moody Conservation District has taken the lead sponsorship of the project. Brookings, Lake, Minnehaha, Lincoln and Union Counties remain co-sponsors for the project and regularly attend stakeholder and steering committee meetings each quarter.

Combining the Lower Big Sioux River Project with the Central Big Sioux River Project will allow project coordinators the ability to work seamlessly throughout the watershed putting emphasis in areas of the watershed that are considered target areas and thoroughly implement BMPs that are needed. As a result, several stakeholders have been included in the project creating a network of federal, state, county and city governmental agencies working together to address the impairments of the Central Big Sioux River Watershed from the Brookings/Hamlin County line to its confluence with the Missouri River at Sioux City. An increased budget through the use of State Revolving Fund Non-Point Source dollars generated from the City of Sioux Falls has given the project a boost and additional incentives for producers to adopt BMPs critical to achieve the TMDLs set throughout the watershed.

Future activities will continue through the Central Big Sioux Implementation project and should work closely with the project sponsor and partners to address the resource concerns in high priority areas of the watershed. Personal contacts and public meetings should continue in order to inform and educate landowners of opportunities available as the project evolves. Project personnel should invest as much time as possible working with landowners to develop a shared interest in restoring the beneficial uses of the watershed. Project reports and progress should be shared with Iowa and Minnesota personnel that are also working on implementation activities in their portions of the Lower Big Sioux Watershed. Existing programs such as CRP and EQIP should continue to be used along with 319 dollars to accomplish the overall goals of the project.

Additional efforts to create awareness and interest for riparian grassland buffers and rotational grazing should be made. In future segments of the watershed project, producers with pasture and cropland along riparian areas should continue to be contacted to plan for BMPs. There is interest to enroll cropland into filter strips and buffers, but pasture practices remained a difficult sell. Creation of a database with producers that own land adjacent to streams in the watershed would be a valuable tool for contacting and mailing information about project opportunities. Mailings could serve as a way to measure producer interest on a large scale towards changing management of the riparian areas from traditional methods to newer systems with less impact. Levels of

riparian program activity should be continually monitored throughout the project in order to aid in the development of new and fresh ideas to enhance riparian health.

BMPs that reduce sediment transport should be considered for this portion of the watershed. The bank stability testing should be completed in order to refine future segment implementation projects to target critical areas on and along the river.

Animal feeding operations should remain a high priority in regard to waste storage, handling and utilization. Nonpoint sources of runoff should be targeted for implementation activities along and near tributaries and the Lower Big Sioux River itself. Installation of BMPs in these sensitive areas will provide the largest benefit to enhancing and protecting water quality in the watershed.

Future water quality monitoring near the mouth of the Big Sioux would be beneficial to determine if overall TMDL targets are being met for the watershed. Additional sampling at the DENR Water Quality Monitoring (WQM) sites during the various flow regimes would better characterize actual water quality trends.

Appendix A

Report Shows Value of Conservation Efforts in Watershed

A new USDA study shows that conservation practices have had positive impacts on reducing pollutant losses from cultivated cropland in the Missouri River Basin. The study is part of a series completed for USDA's Conservation Effects Assessment Project (CEAP). According to the study, conservation practices, including building terraces and reducing tillage, reduce the runoff of sediment by 76 percent, nitrogen by 54 percent and phosphorus by 60 percent.

Although conservation practices installed by producers have reduced the runoff of sediment and nutrients in the Missouri River Basin, according to NRCS, wind erosion remains the top conservation concern in the region.

The report found that 18 percent of cultivated cropland in the region has a moderate or high need for additional conservation practices to further reduce sediment and nutrient losses from the basin. If additional conservation practices were implemented, NRCS estimates that the conservation practices would reduce runoff of sediment by an additional 28 percent, nitrogen by an additional 13 percent and phosphorus by an additional 12 percent.

Appendix B

USDA Natural Resources Conservation Service
In partnership with The South Dakota Association of Conservation

Helping People Help the Land

Central/Lower Big Sioux 319

Terrace Restoration Project

The Lincoln and Union Conservation Districts, SDACD and NRCS would like to announce a cost-share opportunity/project which is now available for producers who have existing terraces which may need reconstruction and are located within the Lower Big Sioux 319 Water Quality Project area.

-Existing terraces which have lost their storage capacity and/or functionality may be eligible for this project following field inspection by NRCS and SDACD personnel.

-The existing terraces must have exceeded their lifespan of 10 years.

-This project is designed to provide landowner/operators assistance to repair existing terrace lines or systems to their **original design**.

-Cost-share incentive payment will be based on the linear footage of terraces that are restored and will be limited to 75% of actual cost not to exceed $0.78/foot, as calculated.

- Significant new terrace construction or conversion from one terrace type to another (example: farmable terrace system converted to a narrow-base grass-back terrace system) will be directed to apply for EQIP funding.

-Financial assistance is available now and applications will be prioritized based on terrace system location within the Lower Big Sioux Water Quality Project area. This is a new program and an opportunity that should not be passed up.

-All interested landowner/operators are encouraged to contact their local NRCS offices or Watershed Coordinator for more information. For immediate questions you may contact Barry Berg @ 605-759-2650.

NRCS NEWS RELEASE

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Federal Building, 200 Fourth Street SW · Huron, SD 57350-2475 · (605) 352-1200 · (605) 352-1288 (FAX)

NEWS
For Immediate Release

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AGENCIES WORK TOGETHER TO ASSIST AG PRODUCERS TO REPAIR TERRACES

NATURAL RESOURCES CONSERVATION SERVICE, Elk Point, SD, September 20, 2012 – Local farmers welcome a gentle rain to give thirsty crops a boost this time of year. However, recent destructive storms in the Big Springs area wrecked havoc to terraces that were constructed years ago," according to Jeff Loof, District Conservationist for USDA Union County Natural Resources Conservation Service, Elk Point, SD.

Loof said, "Several terraces were damaged. But there's help to build new terraces or maintain those in place through the Terrace Restoration Project or Environmental Quality Incentives Program (EQIP) Program. Plan ahead. The application, approval process and field checks needed to be done before the work can be done this fall."

The Terrace Restoration Project technical assistance and cost-share for producers if their existing terraces have lost storage capacity or functionality. Existing terraces must have exceeded a lifespan of 10 years to qualify. This program is also provides landowners and operators assistance to repair existing terrace lines or systems to the original design.

EQIP is a voluntary program that provides financial and technical assistance to ag producers to help plan and implement conservation practices that address natural resource concerns on non-federal property. If a farmer needs to do significant new terrace construction or convert to a different terrace, they will be directed to apply for EQIP funding.

Financial assistance is available now through NRCS and the South Dakota Association Conservation Districts (SDACD). Applications are prioritized based on location of the terrace system within the Central/Lower Big Sioux Water Quality Project area. Producers interested in signing up should contact the USDA Union Co. NRCS office at (605)356-3308, Ext. 3.

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