

1.0 PROJECT SUMMARY SHEET

PROJECT TITLE: Big Sioux River Watershed Project - Segment 3

NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR/SUBGRANTEE:

Moody County Conservation District
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STATE: South Dakota
HYDROLOGIC UNIT CODE: 10170202 & 10170203
HIGH PRIORITY WATERSHED: Yes - 303(d) List

TMDL Development ___ **and/or Implementation** X

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
<input checked="" type="checkbox"/> Staffing & Support	<input type="checkbox"/> Groundwater	<input checked="" type="checkbox"/> Agriculture <input type="checkbox"/> Hydro Modification
<input checked="" type="checkbox"/> Watershed	<input type="checkbox"/> Lakes/Reservoirs	<input checked="" type="checkbox"/> Urban Runoff <input type="checkbox"/> Other
<input type="checkbox"/> Groundwater	<input checked="" type="checkbox"/> Rivers	<input type="checkbox"/> Silviculture
<input checked="" type="checkbox"/> I & E	<input checked="" type="checkbox"/> Streams	<input checked="" type="checkbox"/> Construction
	<input checked="" type="checkbox"/> Wetlands	<input type="checkbox"/> Resource Extraction
	<input type="checkbox"/> Other	<input type="checkbox"/> Stowage/Land Disposal

PROJECT LOCATION: Latitude North 44⁰ 00' 00" Longitude West 096⁰ 45' 00"

SUMMARIZATION OF MAJOR GOALS:

Restore and protect the beneficial uses of the portion of the Big Sioux River and its tributaries (in South Dakota) between the Brookings/Hamlin County line and its mouth at North Sioux City, South Dakota by implementing and promoting best management practices (BMPs) in the watershed that reduce sediment loading and prevent bacterial contamination. Attaining the goal will reduce the total suspended solids (TSS) and/or bacteria (fecal or E.coli) levels and meet the 30 separate Total Maximum Daily Loads (TMDLs) developed for the river, several tributaries and lakes.

PROJECT DESCRIPTION:

The Big Sioux River Watershed Project is a 10-year TMDL implementation strategy that will be completed in multiple segments and parts. The project will restore and/or maintain the water quality of the Big Sioux River and its tributaries to meet the designated beneficial uses. The Lower Big Sioux River, Central Big Sioux River and the North-Central Big Sioux River/Oakwood Lakes Watershed Assessments identified various segments of the Big Sioux River and certain tributaries between the Brookings/ Hamlin County line and Sioux City, Iowa as failing to meet designated uses due to impairments from total suspended solids (TSS), dissolved oxygen and/or bacteria. The current project (Segment 3) is focused on further reducing loadings from animal feeding operations, overland sediment transport and expand ongoing past project activities (Segment 1 and Segment 2). It also extends water quality monitoring, begun under Segment 1, through 2018.

FY 15 319 Funds Requested:	\$ 600,000	Local and State Match:	\$ 4,219,750
Future FY 319 Fund Requests:	\$ 400,000	Total Project Cost:	\$ 9,160,400
Other Federal Funds:	\$ 3,940,650 (USDA)		

2.0 STATEMENT OF NEED

2.1 The Big Sioux River Watershed Project is a 10-year, multi-segment, multi-part TMDL implementation strategy designed to restore and/or maintain water quality in the Big Sioux River basin in eastern South Dakota. Through the application of best management practices (BMPs) targeting sediment erosion and animal waste management, this project will restore water quality of the Big Sioux River and its tributaries to support the designated beneficial uses and reach the TMDLs established for each waterbody. The project addresses the needs identified in the Lower Big Sioux River/Central Big Sioux River (December 2004) and the North-Central Big Sioux River/Oakwood Lakes (December 2005) Watershed Assessment Projects and the 38 approved TMDLs that resulted from these studies. This proposal is the third of several successive implementation project segments designed to achieve the ultimate project goal. Impairments to the beneficial uses of the Big Sioux River and its tributaries are shown on Table 2.1.

Table 2.1: Beneficial Use Impairments Identified in the Central Big Sioux River Watershed (2012 South Dakota Integrated Report for Surface Water Quality)

<u>Impaired Water Body</u>	<u>Impaired beneficial use</u>	<u>Cause</u>
Big Sioux River		
S2-104N-49W to I-90	IR, WWSFLP	FCB & EC, TSS
I-90 to Diversion return	IR, LCR, WWSFLP	FCB & EC, TSS
Diversion return to SF WWTF	IR, LCR, WWSFLP	FCB & EC, TSS
SF WWTF to above Brandon	IR, WWSFLP	FCB & EC, TSS
Above Brandon to Nine Mile Creek	IR, LCR, WWSFLP	FCB & EC, TSS
Nine Mile Creek to near Fairview	IR, WWSFLP	FCB & EC, TSS
Fairview to Alcester	IR, LCR, WWSFLP	FCB & EC, TSS
Near Alcester to Indian Creek	IR, LCR, WWSFLP	FCB & EC, TSS
Indian Creek to Mouth	IR, WWSFLP	FCB & EC, TSS
Beaver Creek 2 (Minnehaha)	LCR	FCB
Beaver Creek 1 (Lincoln)	LCR	FCB
Peg Munky Run	LCR	FCB
Pipestone Creek	IR	FCB & EC
Six Mile Creek	LCR	FCB
Skunk Creek	LCR, WWMFLP	FCB, TSS
Split Rock Creek	IR	FCB
East Brule Creek	LCR, WWMFLP	FCB, TSS
Willow Creek	LCR	FCB
Lake Alvin	WWPFLP	Temperature
East Oakwood Lake	WWSFLP	PH

LCR - limited contact recreation standard = 2,000 colonies per 100 milliliters of water;

EC - *E. coli* bacteria;

FCB - fecal coliform bacteria

WWSFLP - warm water semipermanent fish life propagation-applicable standard varies with water body;

WWMFLP - warm water marginal fish life propagation - applicable standard varies with water body;

WWPFLP - warm water permanent fish life propagation – applicable standard varies with water body;

TSS - total suspended solids;

IR - immersion recreation standard = 400 colonies per 100 milliliters of water;

DO - dissolved oxygen.

In addition to the river segments, and creeks specifically noted in Table 2.1, additional sub-watersheds were found to be contributing impairments to downstream water bodies. In some instances, addressing pollution sources in areas not technically impaired (due to a lack of a defined beneficial use or uses) may be necessary to meet TMDLs.

The Central Big Sioux River basin is located in northwest Iowa, southeastern South Dakota, and southwest Minnesota (Figure 2.1). The lower portion of the Big Sioux River forms the border between Iowa and South Dakota from the Iowa/Minnesota border to the Missouri River. Since a major portion of the Central Big Sioux River Watershed is located in both Minnesota and Iowa, TMDLs were based in part on data from those portions of the watershed that have been assessed by the respective states. Implementation projects in both Minnesota and Iowa will need to address impairments to their contributing watersheds and apply BMPs based on respective loadings in order to attain the TMDLs that have been developed. This project will focus on the South Dakota portion of the watershed.

Several water bodies, over a substantial geographic area, are impaired within the Central Big Sioux River watershed. The impairments impact the use of the river and streams for boating, fishing, swimming and other recreational uses. Further, while the impairments have not yet affected use of the river as a domestic water supply the increased loading may require more extensive purification treatment in the future. As the City of Sioux Falls currently extracts about 65% of its drinking water from the Big Sioux River, correcting these problems will have an impact well beyond the current recreational and aesthetic problems.

The Central Big Sioux River and North-Central Big Sioux River/Oakwood Lakes Watershed Assessment Projects identified several sources of total suspended solids (TSS) and bacteria (fecal and *E. coli*) that constitute the primary impairments in the area. Excessive total suspended solids, i.e., fine sediment suspended in the waters of the river and its tributaries, are found primarily in the Big Sioux River. Segments not technically exceeding the applicable standard still have levels that contribute to impairments downstream. TSS levels in most tributaries are below beneficial use standards, suggesting that current land-use practices within these areas do not result in sediment loading. The exception is found in southern Minnehaha, Lincoln and northern Union Counties where natural conditions may exacerbate human impacts on sediment loading. Consequently, BMPs aimed at sediment reduction were focused on the Central Big Sioux River Mainstem and major tributary sub-basins. Bank stabilization, riparian area management and terrace restoration were identified as the principle BMPs.

Bacteria (fecal and *E. coli*) impairments were encountered throughout the study area, although the highest levels were detected in the southern end of the watershed. The source of the bacteria is believed to be primarily domestic livestock, although human and wildlife sources might contribute a portion of the total load encountered. Bacteria (fecal and *E. coli*) levels were analyzed at several river/stream flow conditions in an effort to determine the timing of major loadings. The most significant loadings were measured during high flow events, which were coincident with either major storms or spring snow melt. The bacteria encountered there were carried into the receiving waters by runoff, most likely from animal feeding operations. One thousand five hundred twenty five (1,525) animal feeding operations were inventoried and assessed using the AGNPS Feedlot Subroutine throughout the watershed. Four hundred ninety two (492) of the feedlots had AGNPS ratings of 50 or higher, and are candidates for improvement to reduce loadings. However, elevated levels of bacteria (fecal and *E. coli*) were also encountered during periods of low flow, often many weeks after a runoff event. Under these conditions, animal feeding operations would not be expected to contribute, and the source is likely to be animals grazing in close proximity to the river and creeks. BMPs to address the bacterial (fecal and *E. coli*) impairments include installation of animal waste management systems at existing feedlots and restricting access to the water bodies by grazing animals.

Details and additional information of the results of the Central Big Sioux River Watershed Assessment Project can be found in the Final Report and associated TMDL reports. Reports from the North-Central Big Sioux River/ Oakwood Lakes Watershed Assessment Project are available. Visit the Department of Natural Resources webpage at the following address: http://denr.sd.gov/dfta/wp/tmdlpage.aspx#Big_Sioux for additional information.

2.2 The Central Big Sioux River Watershed Project encompasses the Big Sioux River (in South Dakota) between the Brookings/Hamlin County Line in the north and Sioux City Iowa in the south. The project watershed area is approximately 2,107,000 acres (see Table 2.2).

Table 2.2: Big Sioux River and its Basin Features.

Waterbody Name:	Big Sioux River, 18 impaired stream segments and 2 impaired lakes
Hydrologic Unit Code:	Big Sioux River – 10170202, 10170203
SD DENR Waterbody ID:	SD-BS-R-BIG_SIOUX_04-17
Location:	S27, T113N, R51W to S30, T89N, R47W
Impaired Beneficial Use and Cause:	See Table 2.1
Major Tributaries (South Dakota):	Peg Munky Run, North Deer Creek, Skunk Creek, Beaver Creek, Brule Creek
Major Tributaries (Minnesota):	Beaver Creek, Pipestone Creek, Split Rock Creek, Rock River
Major Tributaries (Iowa):	Rock River, Sixmile Creek, Indian Creek, Broken Kettle Creek
Receiving Waterbody:	Missouri River
Big Sioux River Segment Length:	311 miles
Watershed Area:	
Total	3,921,000 acres
South Dakota	2,107,000 acres
Minnesota	937,000 acres
Iowa	877,000 acres

The BSR and major tributaries are permanent water courses within the project area. There are also numerous intermittent tributaries which carry water only during spring snow melt or rainfall events. The BSR ultimately drains to the Missouri River at Sioux City, Iowa. The river also receives storm sewer discharges or otherwise enhanced runoff from several communities along its course in South Dakota including the cities of Brookings, Flandreau, Dell Rapids, Sioux Falls, Brandon, Canton and Hudson. Cities along the River on the Iowa side include Hawarden and Akron. Sections of the stream have been impacted by channelization (straightening and/or artificial stabilization) and numerous road crossings over the river and tributaries.

Many segments of the river do not fully support the designated uses, particularly with regard to limited contact or immersion recreation (Table 2.1). The 1998 South Dakota 303(d) Waterbody List, and subsequent versions in 2006 and 2008, identified this portion of the BSR watershed as impaired and a priority for TMDL development. Fifteen impairments were known at the start of the studies, seven for total suspended solids (TSS), six for bacteria (fecal and E. coli), one for nitrate and one for trophic state index (East Oakwood Lake). With the completion of the Lower, Central and North-Central Big Sioux River Watershed Assessment Projects, a total of 39 impairments were identified: 26 for fecal and E. coli; 11 for TSS; one for temperature and one for PH. A total of 38 separate TMDL reports have been prepared as a result of the assessment projects. The reports form the basis for the proposed Central Big Sioux River Watershed Project.

2.3 Map of the watershed project area. See Figure 2.2.

2.4 Land use in the watershed is primarily agricultural. Row crops, such as corn and soybeans, dominate, but significant tracts are also in grass and/or pasture land. The watershed assessments identified approximately 1,525 animal feeding operations located within the confines of the project area. Significant residential development has taken place around the cities of Sioux Falls, and Brookings, and smaller communities in the region are experiencing similar growth. Total population in the project area is roughly 240,000.

Entire Central Big Sioux Watershed

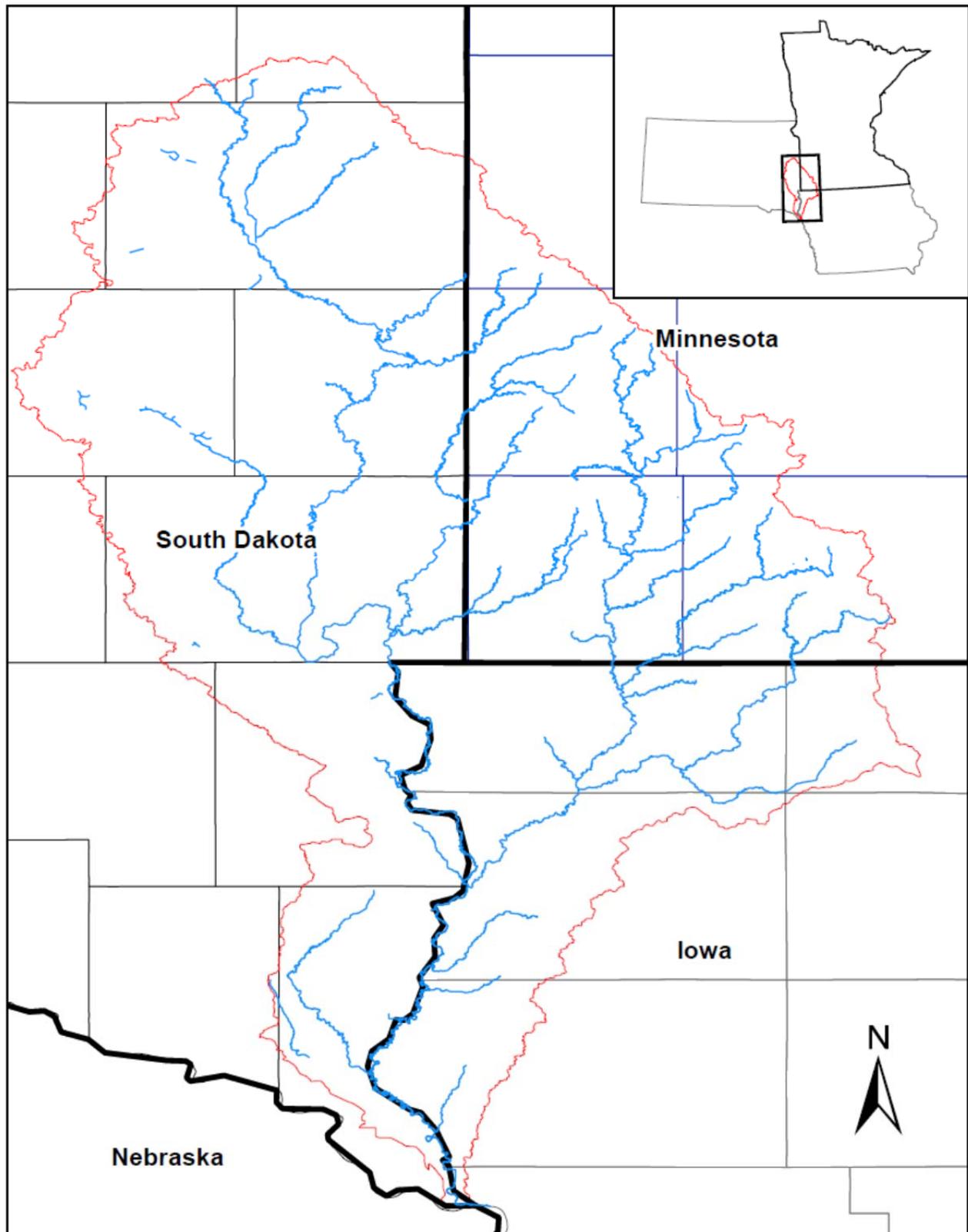
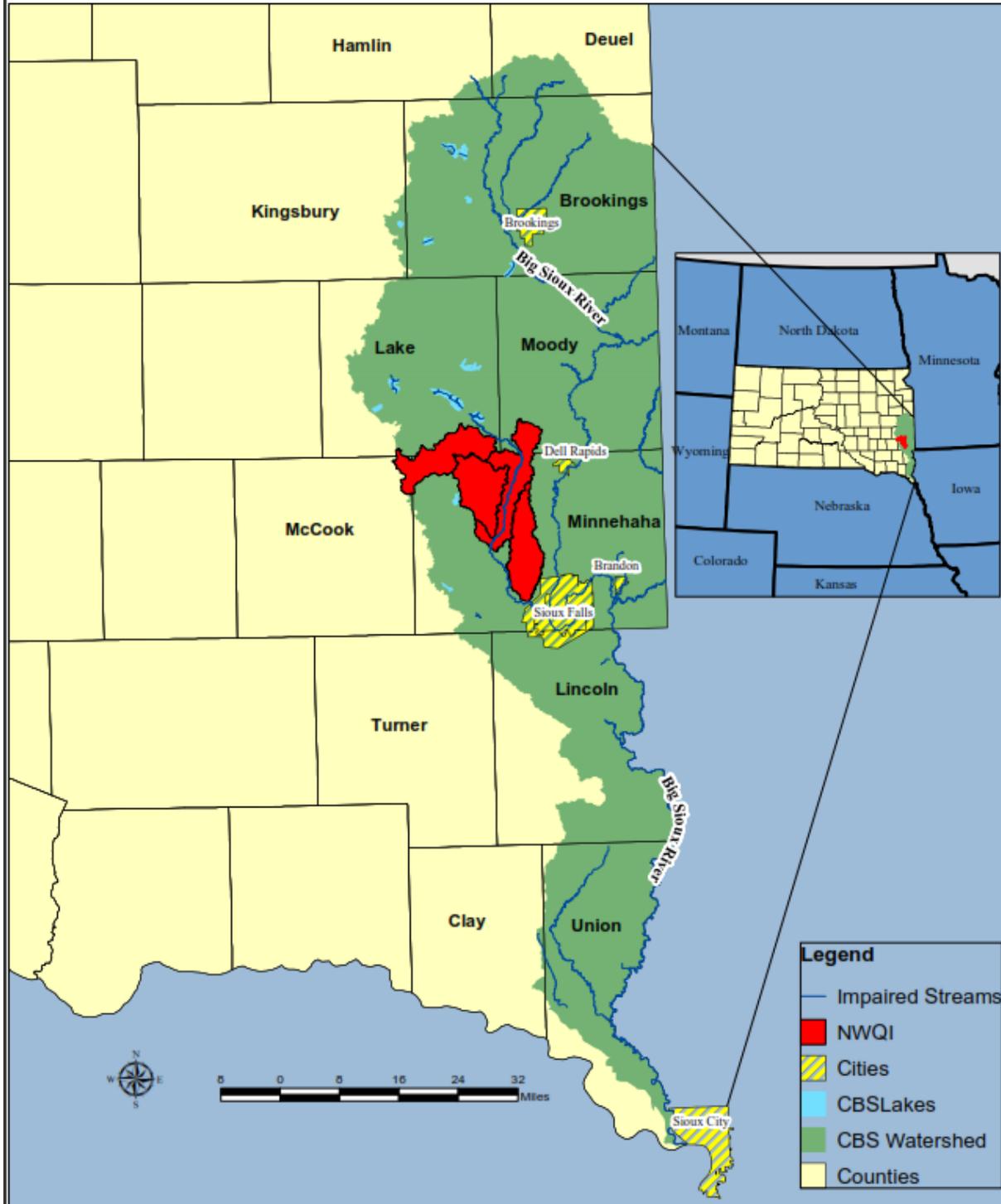


Figure 2.1: Entire Central Big Sioux Basin.

Central Big Sioux River Watershed



Central Big Sioux Combined Project Area

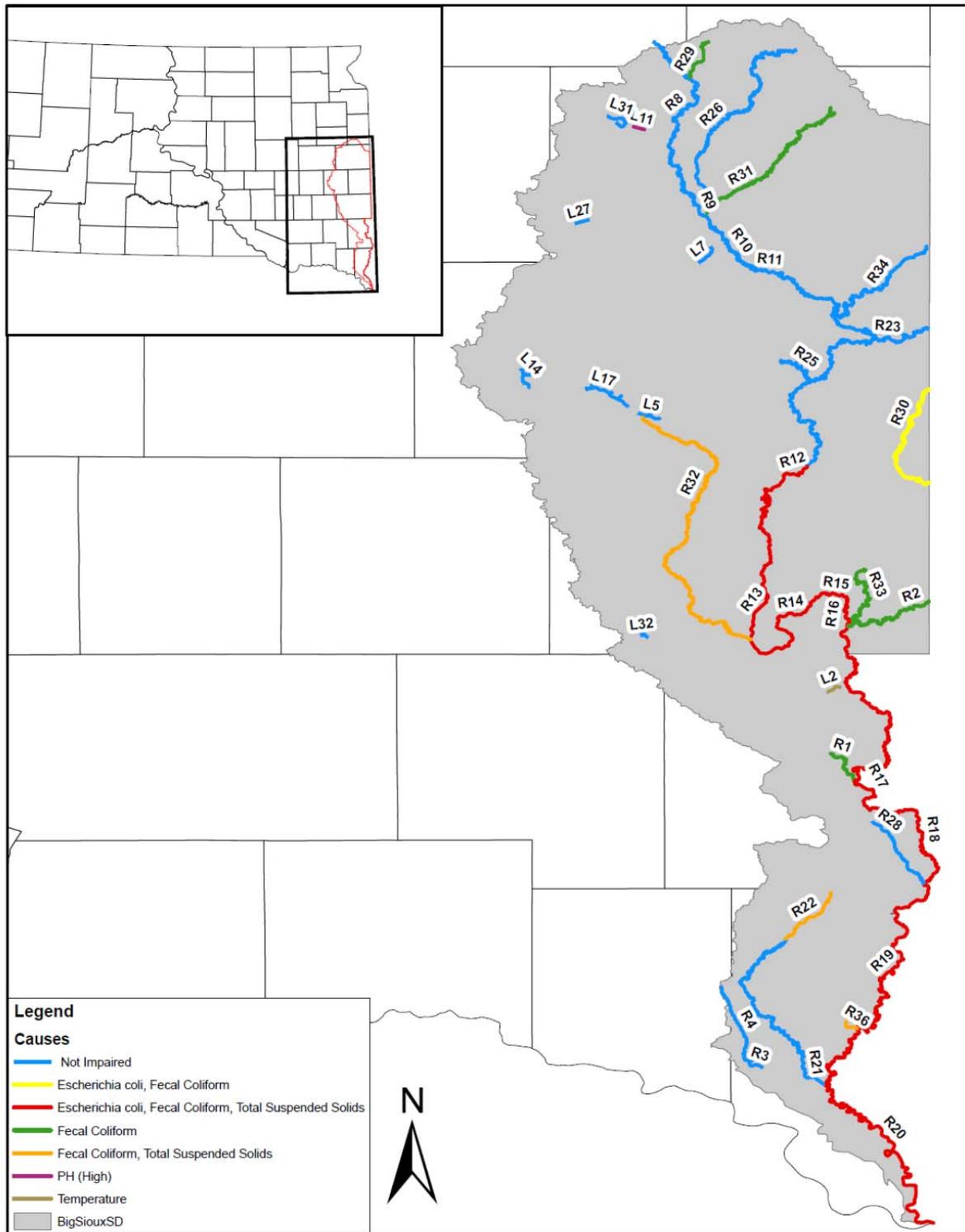


Figure 2.2 Watershed Area



Figure 2.3 Location of the Central Big Sioux River Watershed Project. Monitoring sites shown are those used during the Central Big Sioux River Watershed Assessment Project, many of which are to be reused during the current project to assess the impact of various BMPs. (See Section 5.0)

The average annual precipitation in the central BSR watershed is 23.2 inches, of which 76% typically falls April through September. Tornadoes and severe thunderstorms strike occasionally. These storms are often of only local extent and duration, and occasionally produce heavy rainfall events. The average seasonal snowfall is 36.5 inches per year.

The surficial character of the watershed can be divided into two parts, relating to the relative age of the landscape. Along the BSR valley, and the eastern tributaries, drainage is well developed and undrained depressions are rare. To the west of the river, where drainage is poor, there are numerous potholes, sloughs, and lakes. The relief in the area is moderate. Land elevation ranges from nearly 2,000 feet above mean sea level in the northeastern part of the watershed to about 1,265 feet in the southern edge of the project area.

Soils within the watershed area are derived from a range of parent materials. Uplands soils are relatively fine-grained and developed over glacial till or thin eolian (loess) deposits. Coarse-grained soils, derived from glacial outwash or alluvial sediments, are found along present or former water courses. In central and eastern Minnehaha County, in the southern part of the project area, the loess deposits are thick, often in excess of 20 to 30 feet, and the resulting

soils are highly erodible. When combined with the relatively high relief, these areas are susceptible to erosion, regardless of land-use practices.

2.5 The Central Big Sioux River and the North-Central Big Sioux River/Oakwood Lakes Watershed Assessment Projects were initiated at the request of local organizations and citizens concerned about water quality problems in the Big Sioux River between the communities of Watertown and Brandon. The main issues were related to high suspended sediment loads that adversely affected fish populations (both numbers and diversity) and high bacterial loads that limited water use for swimming and boating.

The watershed assessments included:

- River and tributary water monitoring from 1999 through 2003;
- Quality assurance/quality control for water quality samples;
- River and tributary stage and discharge determinations;
- Biological monitoring (fish and insects);
- Watershed modeling using a sediment delivery model; and
- Review of previous water quality data collected for the watershed.

The assessment project confirmed that most segments of the Big Sioux River, and many of the tributaries, were impaired due to high levels of bacteria (fecal and E. coli). The limited contact standard of 2,000 colonies per 100 ml of water, which is applicable to the entire river stretch, was most often exceeded during high flow events, suggesting runoff from feed lots as a source. However, high E. coli counts at low flow rates suggest that animal grazing in or near the river and its tributaries is a significant influence. The E. coli problem becomes particularly acute below the community of Dell Rapids, where the more stringent immersion recreation standard (400 colonies per 100 ml) is also applicable. For most of the watershed below this point, reductions in excess of 75% to 95% are needed to meet the beneficial use standards. In this area, both feedlots and riparian area grazing are known problems.

Table 2.3: Fecal and E. coli Bacteria Reductions Needed by TMDL Segment.

Site ID	High Flow Reduction Needed (cfu/day)		Moist Flow Reduction Needed (cfu/day)		Mid Flow Reduction Needed (cfu/day)		Dry Flow Reduction Needed (cfu/day)	
	FCB	EC	FCB	EC	FCB	EC	FCB	EC
R-1 (Beaver Creek 01) **	8.74E+13	None	1.48E+12	None	None	None	6.30E+10	None
R-2 (Beaver Creek 02) **	3.12E+13	None	None	None	None	None	None	None
R-12 (Big Sioux 08) *	6.22E+12	None	2.12E+12	None	2.77E+12	None	2.48E+12	None
R-13 (Big Sioux 10) *	1.06E+13	None	1.82E+13	None	2.09E+12	None	9.17E+11	None
R-14 (Big Sioux 11) *	3.18E+13	None	1.28E+13	None	3.21E+12	None	1.54E+12	None
R-15 (Big Sioux 12) *	4.15E+13	None	1.59E+13	None	3.20E+12	None	1.29E+12	None
R-16 (Big Sioux 13) *	8.85E+12	5.20E+12	None	None	None	None	None	None
R-17 (Big Sioux 14) *	2.61E+13	1.53E+13	None	None	None	None	None	None
R-18 (Big Sioux 15) *	2.18E+14	1.28E+14	1.92E+13	1.13E+13	None	None	None	None
R-19 (Big Sioux 16) *	9.05E+13	5.31E+13	6.96E+12	4.09E+12	None	None	None	None
R-20 (Big Sioux 17) *	7.45E+14	4.38E+14	None	None	None	None	None	None
R-22 (East Brule Creek 01) *	7.98E+14	None	1.09E+13	None	1.12E+12	None	4.56E+11	None
R-29 (Peg Munkey Run 01) *	1.76E+15	None	None	None	6.79E+10	None	1.77E+09	None
R-30 (Pipestone Creek 01) **	5.31E+12	None	None	None	6.87E+11	None	None	None
R-31 (Six Mile Creek 01) **	1.10E+10	None	None	None	None	None	None	None
R-32 (Skunk Creek 01) **	4.12E+14	None	None	None	None	None	None	None
R-33 (Split Rock Creek 01) **	1.28E+14	None	3.62E+12	None	5.67E+11	None	None	None
R-36 (Union Creek 01) *	5.84E+15	None	4.00E+16	None	4.70E+15	None	5.50E+12	None

* margin of safety included in calculation

** margin of safety not included in calculation

TSS impairments are limited to the Big Sioux River below Brookings. Excessive TSS levels in the tributaries only occur in the lower part of Skunk Creek and the Pipestone Creek/Split Rock Creek system. Degraded riparian areas and stream bank erosion are believed to be the primary source of sediment, along with remobilization of in-stream sediment. Low sediment inputs from most tributaries indicate current land-use practices are successfully limiting erosion. High sediment levels found in the tributaries that span eastern and central Minnehaha County are attributed to the relatively high erosion potential of the soils in the area.

Table 2.4: TSS Reductions Needed by TMDL Segment.

Site ID	High Flow Reduction Needed	Moist Flow Reduction Needed	Mid Flow Reduction Needed	Dry Flow Reduction Needed
	TSS (tons/year)	TSS (tons/year)	TSS (tons/year)	TSS (tons/year)
R-1 (Beaver Creek 01)	None	None	None	None
R-2 (Beaver Creek 02)	TMDL Reduction Met	TMDL Reduction Met	TMDL Reduction Met	TMDL Reduction Met
R-12 (Big Sioux 08)	25039	None	None	None
R-13 (Big Sioux 10)	None	8,505	None	None
R-14 (Big Sioux 11)	871,218	None	None	None
R-15 (Big Sioux 12)	237,652	None	None	None
R-16 (Big Sioux 13)	Assessment Initiated	Assessment Initiated	Assessment Initiated	Assessment Initiated
R-17 (Big Sioux 14)	Assessment Initiated	Assessment Initiated	Assessment Initiated	Assessment Initiated
R-18 (Big Sioux 15)	556,880	239,257	1,095	621
R-19 (Big Sioux 16)	1,448,576	273,568	13,322	10,768
R-20 (Big Sioux 17)	5,627,315	147,570	30,843	212,067
R-22 (East Brule Creek 01)	Assessment Initiated	Assessment Initiated	Assessment Initiated	Assessment Initiated
R-29 (Peg Munkey Run 01)	None	None	None	None
R-30 (Pipestone Creek 01)	None	None	None	None
R-31 (Six Mile Creek 01)	None	None	None	None
R-32 (Skunk Creek 01)	Not Initiated	Not Initiated	Not Initiated	Not Initiated
R-33 (Split Rock Creek 01)	TMDL Reduction Met	TMDL Reduction Met	TMDL Reduction Met	TMDL Reduction Met
R-36 (Union Creek 01)	None	None	None	None

In several instances, sub-watersheds assessed during the study had no applicable water quality standard. However, the loadings resulting from these sub-watersheds will need to be addressed if subsequent, down-stream water bodies are to be brought into compliance.

Since the start of Segment 2 of this project NRCS has selected four HUC 12s for the National Water Quality Initiative (NWQI) within the watershed. Due to NWQI requirements more intense monitoring of the HUCs must be incorporated into the project. The 22 Big Sioux River monitoring sites and 11 tributary sites are shown in Figure 2.4. Of the 11 tributary sites, four were added to monitor the impacts of BMPS in the NWQI area. Also shown in Figure 2.4 are the NWQI monitoring sites in relation to their location in the watershed.

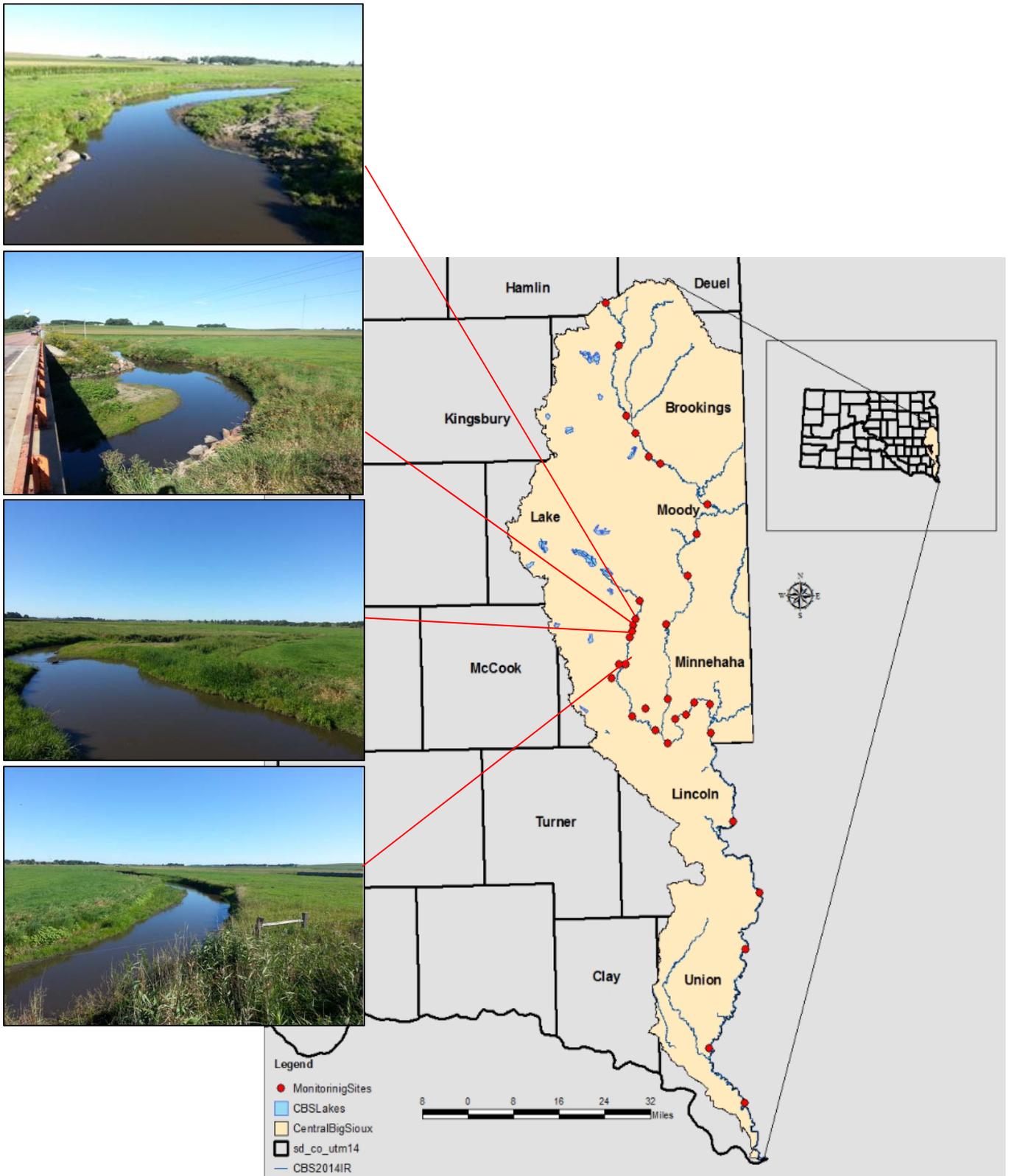


Figure 2.4 Current Monitoring Project

3.0 PROJECT DESCRIPTION

3.1 Project Goal - The overall project goal is to restore and protect the beneficial uses of the portion of the Big Sioux River and its tributaries (in South Dakota) between the Brookings/Hamlin County line and North Sioux City South Dakota by implementing and promoting best management practices (BMPs) in the watershed that reduce sediment loading and lower and/or prevent bacterial contamination. Attaining the sediment goal will require reducing total suspended solids (TSS) in the river and selected tributaries by between 20% and 98%. Bacteria (fecal and E. coli) levels found throughout the study area commonly exceed the water quality standard, particularly in regards to immersion recreation. Attainment of bacteria (fecal and E. coli) TMDLs will, in certain areas, require reducing bacterial loads by over 95%. Such targets are beyond the scope of this project segment.

The targets for this part of the project will be measurable and sustainable reductions of bacteria (fecal and E. coli) levels at the completion of the third multi-part segment of the restoration project. Restoration of the beneficial uses of the Big Sioux River and its tributaries, through implementation of BMPs described below and those supported through subsequent projects should lead to attainment of TMDL targets.

3.2 Objectives and Tasks

Objective 1: Reduce bacteria (fecal and E. coli) and sediment loadings to the Big Sioux River and its tributaries through the renovation and improvement of existing, high-priority animal feeding operations and limiting the access of livestock to impaired water bodies.

Task 1: Animal Waste Management Systems. Assist livestock producers to install a total of 13 Animal Waste Management Systems (AWMSs) at critical locations within the project area to reduce fecal bacteria and sediment loading.

The AWMSs will be a mix of conventional zero-discharge systems, manure pack and deep pit slated floor barns depending on the site conditions and operator preference. Site selection and facility type constructed will be made by the project coordination team, in consultation with the United States Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) Animal Waste Management Team (AWMT) and private engineering firms that are registered technical service providers in South Dakota. Systems targeted for implementation efforts will be those with AGNPS ratings of 50 or higher, or those located in close proximity to receiving water bodies.

Products Feasibility studies on 13 AFO, engineering designs and plans for 13 AWMSs and 13 nutrient management plans prepared by third-party engineering firms/technical service providers or (USDA-NRCS) engineers, 13 AWMS installed consisting of conventional and confinement barns for existing high priority feedlots or feeding areas.

Milestones: AWMS Feasibility and Design – 13 plans
AWMS Construction – 13 systems

Total Cost: \$5,525,000

FY15 319 Funds: \$123,725

SRF Funding: \$355,000

Responsible Agencies:

Project Coordinator
Conservation Districts
City of Sioux Falls

Design and Technical Assistance:

Project Coordinator
Technical Service Providers
SDACD 303(d) Technical Assistance Project
USDA-NRCS
Conservation Districts

Task 2: Riparian Area Protection. Provide resources to livestock owners to limit or prevent access to impaired water bodies and provide alternative water sources to replace the impaired water bodies.

BMPs will be implemented targeting critical riparian areas that have been, or have the potential to be, significant sources of bacteria (fecal and E. coli) contamination and sediment loadings due to the degradation of riparian areas. Emphasis will be on pastures that abut or transect the Big Sioux River, Skunk Creek and major tributary streams. Seasonal Riparian Area Management (SRAM) is a new program developed in segment 2 of the Central Big Sioux River Watershed Project. Enrollment of land immediately adjacent to Skunk Creek and within the 100 year flood plain is eligible for the program. Livestock producers enrolling pasture into the program will be paid \$60 per acre to defer grazing from April through September but be allowed to dormant graze from October through April as long as a minimum vegetative stand of 4 to 6 inches remains. If requested, alternative water will be provided during the dormant grazing period to minimize impacts on the riparian area. Haying will be allowed from April through September for the acres enrolled to utilize the forage and maintain the vigor of the vegetative stand. Fencing, pipelines and tanks will be eligible for cost share not to exceed 75 percent project incentives with 25 percent producer match. The program has been piloted and evaluated on Skunk Creek for two years in Segment 2 and has shown a considerable amount of success in reduction of E-coli and TSS. Due to the success and acceptance of the SRAM program, it is planned to be expanded to the rest of the project watershed with emphasis still on the major tributaries in the Skunk Creek basin. Pollinator habitat will be an enhancement to the SRAM program for the honey bee effort and also help leverage dollars from the Regional Conservation Partnership Project (RCPP)

Products: 43 Acres of riparian area management, 1,700 acres of seasonal riparian area management, 10 grazing management systems, 20 water developments, 5,000 linear feet of bank stabilization with rehabilitation of existing stabilization structures as needed and 15 acres of pollinator habitat.

Milestones: Riparian Area Management – 43 acres
Seasonal Riparian Area Management – 1,700 acres
Grazing Management Systems – 10 systems
Water Developments – 20 developments
Bank Stabilization – 5,000 linear feet
Pollinator Habitat – 15 acres

Total Cost: \$2,638,800 FY15 319 Funds: \$169,800 SRF Funding: \$1,692,300

Responsible Agencies:

Project Coordinator
Conservation Districts
City of Sioux Falls

Design and Technical Assistance:

Project Coordinator
Technical Service Providers
SDACD 303(d) Technical Assistance Project
USDA-NRCS
Conservation Districts
City of Sioux Falls

Task 3: Cropland Management BMPs.

Provide assistance to restore 10,000 LF of terraces; install 10,000 LF grassed waterways; 20 acres of filter strips, 300 acres of cover crops and 5 acres of pollinator habitat to landowners/operators to reduce sediment and nutrient loads originating from identified critical areas. 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 will 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 will be directed towards utilization of the existing EQIP program for funding before consideration of 319 funds. Over the course of the implementation project, the terrace restoration project will restore and repair 10,000 linear feet of failing and damaged terraces that may not be a good fit for the EQIP program. 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. Technical assistance will be provided to landowners to install 5 acres of pollinator habitat on cropland to help with the honey bee effort and also leverage additional funding for the project from the RCPP.

Products:

10,000 linear feet of terraces, and 10,000 linear feet of grassed waterways, 20 acres of filter strips, 300 acres of cover crops and 5 acres of pollinator habitat. BMPs installed will be funded by the landowner/operator, USDA conservation programs (EQIP, RCPP and CCRP) and by state conservation programs. BMPs planned for installation are listed below:

Milestone: Terrace Restoration on cropland – 10,000 linear feet
Grassed Waterways – 10,000 linear feet
Filter Strips – 20 acres
Cover Crops – 300 acres
Pollinator Habitat – 5 acres

Total Cost: \$56,000 FY15 319 Funds: \$9,000 SRF Funding: \$0

Responsible Agencies:

Conservation District Partners
Project Coordinator
USDA/NRCS

Design and Technical Assistance:

Project Coordinator
Farmers and Ranchers
Extension Service
USDA/NRCS

Objective 2: Information, Education and Public Participation. Informing the public on project success in order to build a positive working relationship between the urban and rural citizens and educating both about how they can make a difference in achieving the project goals.

Task 4: Public Outreach.

Increase public awareness of water quality issues in general and project activities and results throughout the Big Sioux River watershed. Promote sound best management practices that best address priority impairments.

Products:

Conduct at least one public meeting within each county and major city to discuss the project and the activities that will be undertaken. Develop web site links to existing web sites of Conservation Districts, East Dakota Water Development District and City of Sioux Falls to provide information to the public on what activities are happening within the watershed. Conduct community meetings and one on one contact with project landowners to discuss the project and their activities within the watershed. Maintain quarterly Steering Committee meetings to discuss project accomplishments and future project activities. Attend and participate in the Mayors Annual Big Sioux River Summit.

Milestone: Public/Informational meetings – 6
News Releases/Press Releases – 4
Website Updates

Total Cost: \$78,750 FY15 319 Funds: \$13,000 SRF Funding: \$50,000

Responsible Agencies:
Project Coordinator
Conservation Districts
East Dakota Water Development District
City of Sioux Falls

Design and Technical Assistance:
Project Coordinator
Technical Service Providers
Conservation Districts
City of Sioux Falls
East Dakota Water Development District

Objective 3: Monitoring and Evaluation. Conduct water quality monitoring to assess project impacts on impaired water bodies and the effectiveness of bioreactor nitrate removal from agricultural drain tile.

Task 5: Water quality sampling to monitor project impacts.

Monitor water quality at the 22 river and 11 tributary locations. The measure of the effectiveness of BMPs implemented is the change (improvement or degradation) in the quality of water in the targeted water bodies. The impairments being addressed were defined on the basis of water samples collected at selected points within the project area. Water bodies currently listed as impaired will need to be shown to have had the impairments removed or eliminated. See Section 5.1 below for sample sites and parameters to be monitored. In addition, data from existing State-monitored sites (see Tables 5.5 and 5.6) will be assessed and included in the evaluation.

Products Water Quality Monitoring.

Milestones: 750 Water quality Samples.

Responsible Agencies:
Project Coordinator
East Dakota Water Development District

Technical Assistance:
East Dakota Water Development District

Milestones: A total of 10 samples will be taken from the inflow and 10 samples from the outflow which will be analyzed for the two demonstration sites to determine the effectiveness of the treatment.

Products 560 water quality analyses for TSS and bacteria (fecal and E. coli), and other parameters, from 18 sites in the project area. 120 quality assurance/quality control samples run on replicate or blank water samples.

Milestone: 560 water quality samples from 18 sites, plus 120 QA/QC samples.

Total Cost: \$58,750 FY15 319 Funds: \$25,000 SRF Funding: \$0

Responsible Agencies:

Project Coordinator
East Dakota Water Development District

Design and Technical Assistance:

Project Coordinator
SD Department of Environment & Natural Resources
East Dakota Water Development District
Conservation Districts

3.3 Milestone Table (See Table 3.5)

3.4 All required permits will be obtained for the installation of BMPs during this proposed project. Permits required may include U.S. Army Corps of Engineers 404, SD DENR General Storm Water Permit for Construction Activities, water rights and local building permits.

3.5 The Moody County Conservation District is a local government entity whose boundaries lie within the study area, the Big Sioux River watershed between the Brookings/Hamlin County line and North Sioux City South Dakota, making it an appropriate lead sponsor for this project. Moody County Conservation District has a good working relationship with local governmental entities within the area, including counties, municipalities and other conservation districts. Cooperation of all will be needed to successfully implement the project. Moody County Conservation District has experience in working on watershed projects, having sponsored other watershed activities in the area.

3.6 Responsibilities for the operation and/or maintenance of 319-funded BMPs will be provided through contracts between the landowner and Moody County Conservation District, or Moody County Conservation District-designated subcontractors. Contracts developed for BMP installation will specify operation and maintenance needs, procedures for BMP failure or abandonment, and the life-span of the BMPs. Moody County Conservation District will be responsible for completing operation and maintenance scheduling, on-site visits, and follow-up with landowners when actions need to be taken to ensure BMP operation for its intended lifespan.

Table 3.5: MILESTONE TABLE

Big Sioux Implementation Project Segment 3

July 1, 2015 Through June 30, 2020

Goal/Objective/Task	Groups	Quantity	Year 1		Year 2		Year 3		Year 4		Year 5	
			2015	2016	2017	2018	2019	2020				
			July-Dec	Jan-June								
Objective 1. BMP Installation												
Task 1: Livestock Nutrient Management												
Products : Ag Waste Systems, Feasibility studies, Diversions												
Engineering Services	1,2,3,6	13	1	2	2	2	2	2	2	2	2	2
System Installation	1,2,3,6	13			2		2		2		2	
Nutrient Management Plans	1,2,3,6	13			3		3		3		3	
Task 2: Riparian Area Protection												
Products: Plans Developed, Systems designed												
CRP/RAM (acres)	1,2,3,6	43		3		3		3		3		3
SRAM (acres)	1,2	1,700		340		340		340		340		340
Grazing Mgt. System (systems)	1,2,3	10		2		2		2		2		2
Water Developments pipelines, fences, wells pumps	1,2,3,6	20		4		4		4		4		4
Bank Stabilization Engineering Designs	1,2,3,6	8		2		2		2		2		2
Bank Stabilization & Rehabilitation (feet)	1,2,3,6,7	5,000		1000		1000		1000		1000		1000
Polinator Habitat (acres)	1,2,3	15		1		1		1		1		1
Task 3: Cropland BMPs												
Products: Plans Developed and Systems implemented												
Terrace Restoration (feet)	1,2,3	10,000		2000		2000		2000		2000		2000
Grassed Waterways (feet)	1,2,3	10,000		1000		1000		1000		1000		1000
Filter Strips (acres)	1,2,3	20			5		5		5		5	
Cover Crops (acres)	1,2,3	300		60		60		60		60		60
Polinator Habitat (acres)	1,2,3	5		1		1		1		1		1
Objective 2. Information & Education /Public Participation												
Task 5. Public Outreach												
Product : Outreach to Public in Watershed												
Public/Informational Meetings, News Articles, Mailings	1,2,3,4,5,7	92	1	17	1	18	1	17	1	18	1	17
Web site and maintainance (anually)	1,2	5		1		1		1		1		1
Objective 3: Monitoring and Evaluation												
Task 5. Water Quality Monitoring												
Product: Water Quality Sampling and Monitoring												
WQ Monitoring samples	4,5,7	600	65	55	65	55	65	55	65	55	65	55
QA/QC samples	4,5,7	150	15	15	15	15	15	15	15	15	15	15
Task 10: GRTS & Final Reports												
Product : Reports												
Annual Reports	1,2,4	5		1		1		1		1		1
Final Report	1,2,4	1										1***

Groups:

1. Moody County Conservation District
2. Area Conservation Districts
3. USDA - Natural Resources Conservation Service/Farm Service Agency
4. SD Department of Environment and Natural Resources
5. East Dakota Water Development District

6. Private Consultants

7. City of Sioux Falls

***Final report due by December of final year of project

4.0 COORDINATION PLAN

4.1 The lead sponsor for this project is the Moody County Conservation District. Moody County Conservation District will document cash and in-kind match to this project and is responsible for completion of this project's goal, objectives, and tasks.

Several other partners have been involved in previous Big Sioux River watershed projects. Their assistance will be requested as appropriate to each project activity. Organizations expected to participate and support the project requested include:

City of Sioux Falls – Financial and technical assistance for implementation of best management practices (BMPs) targeting TSS reductions through urban area bank stabilization/riparian area restoration, and rural-area bacterial loading reductions.

Brookings, Lake, Lincoln, Union and Minnehaha Conservation Districts – Technical assistance to landowners for implementation of rural BMPs targeting TSS reductions (CRP incentives/buffer strips/grass waterways/etc) and bacterial reductions (animal waste management systems and riparian area restorations). Technical assistance and coordination of urban soil erosion and storm water management BMPs. The project will support hiring of one (1) additional South Dakota Association of Conservation Districts employee who will conduct public outreach and promotion of project activities, and provide technical assistance to landowners and stakeholders as needed.

United States Department of Agriculture (USDA) - Natural Resources Conservation Service – Technical assistance and cost-share funds to landowners for BMP installation.

South Dakota Department of Environment and Natural Resources – Financial and technical assistance for water quality issues, sampling, and project management.

South Dakota Association of Conservation Districts (SDACD) – Technical assistance and contract management.

East Dakota Water Development District – Technical and financial assistance and activity management for water quality monitoring.

Big Sioux River Watershed Steering Committee – Oversee project activities to establish priorities for BMP implementation and application. The project Big Sioux River Watershed Steering Committee will meet on a quarterly basis.

4.2 The Big Sioux River and its tributaries between the Brookings/Hamlin County line and North Sioux City, South Dakota are important economic and social assets to the communities in the project area, as well as rural residents and landowners. The Moody County Conservation District, East Dakota Water Development District, area conservation districts and the City of Sioux Falls have provided leadership for this project.

Community efforts to improve the central portion of the Big Sioux River began during the 1970s with the Lake Herman Clean Water Project, and have been ongoing through a range of formal and informal watershed assessment and implementation projects in the intervening years. Through community support, the Lower Big Sioux River, Central Big Sioux River, North-Central Big Sioux River/ Oakwood Lakes Watershed Assessment Projects were initiated during 1999 and completed during 2005. During the assessment process, water development district and conservation district staff visited with key landowners and stakeholder groups in the watershed to inform them of the project and discuss implementation of potential BMPs. This EPA 319 project proposal was developed cooperatively by representatives of the Moody County Conservation District, East Dakota Water Development District, the City of Sioux Falls, Natural Resources Conservation Service, area conservation districts and DENR. The Central Big Sioux River Watershed Project will be implemented using a local work group to help the Moody County Conservation District coordinate and manage the project.

The Central Big Sioux River Watershed Project will be managed by a project coordination team made up of available local, state, and federal partners (see section 4.1) to maximize technical assistance and funding for successful project implementation.

4.3 All parts of the Central Big Sioux River Watershed Project will be coordinated with other available local, state and federal programs (see Section 4.1) to maximize technical assistance and funding for successful project implementation.

In addition, this project will utilize training and other technical assistance available such as:

- Annual 319 project coordinators training workshops;
- Technical assistance for grassland management through the Grassland Management and Planning Project;
- Technical and administrative training provided by the SDACD, SD DENR, and NRCS; and
- Technical assistance from the SDACD 303(d) Technical Assistance Project for nutrient management system planning and implementation.

4.4 This project will be implemented through coordination with, and in partnerships with, other organization programs to create complementary activities. Key activities by programs that are similar for this project are as follows:

SDACD 303(d) Technical Assistance Project - The South Dakota Association of Conservation Districts has an ongoing program, funded in part with 319 funds, to provide technical assistance to area landowners to identify appropriate BMPs to reduce adverse water quality impacts. The project provides funding for design and engineering work, but no funds for actual construction of the BMPs. The proposed project includes funds that would be available to willing landowners in critical areas who have utilized the SDACD project for other technical assistance.

On-going Implementation Projects - Some segments of the Big Sioux River watershed have ongoing implementation projects. These areas were assessed as part of earlier TMDL studies, and have been in the implementation phase for several years. Current projects are functioning in the Lake Poinsett watershed in Hamlin County and the Upper Big Sioux watersheds covering the remaining counties associated with the Big Sioux River.

SD Nonpoint Source Information and Education Project - Resources from this project, sponsored by the South Dakota Discovery Center, will be utilized to further enhance education and outreach efforts for the project. Staff will also seek assistance in developing education programs and activities.

Proposed Riparian Easement Program - A riparian easement program has been initiated by Northern Parries Land Trust within their area of coverage including the Upper Big Sioux Watershed, Lake Poinsett Project and Central Big Sioux Watershed area.

Project for the development of design criteria and citing of Bank-Toe protection on the Big Sioux River - The United States Department of Agriculture-Agricultural Research Service (USDA-ARS) will conduct a project to develop criteria on the type of material and location of the structures that will provide the best bank-toe protection for the Big Sioux River. See Appendix C

5.0 EVALUATION AND MONITORING

5.1 Monitoring and evaluation efforts will involve:

- Monitoring all project proposed tasks relative to meeting project milestones;
- Bank Stability and Toe Erosion Model (BSTEM)
- Evaluating quality and effectiveness of BMPs installed utilizing available tools (such as AnnAGNPS); and
- In-stream monitoring of the Big Sioux River and tributaries at selected sites to assess water quality changes as a result of the project.

Table 5.5 lists the location of water quality monitoring sites established in the Central Big Sioux River Implementation Project Segment1. Note: all sites selected were also sampling sites used during the watershed assessment project. See Figure 2.3 for locations.

Table 5.5. Central Big Sioux River Watershed Project Water Quality Monitoring Sites.

Site Name	Site Location
R19	Big Sioux River at SD Hwy 28, Estelline
R20	Big Sioux River at 466th Avenue (S of 201st Street), Bruce
R1	Big Sioux River at 213th Street, Brookings
R2	Big Sioux River at 216th Street, Brookings
R3	Big Sioux River at 471st Avenue (old US 77), Brookings
R4	Big Sioux River at 473rd Avenue, Brookings
R5	Big Sioux River at SD Hwy 13 (FSST Pow Wow Grounds)
R6	Big Sioux River at SD Hwy 34, Egan
R7	Big Sioux River at 240th Street, Trent
R8	Big Sioux River at 248th Street, Dell Rapids
R9	Big Sioux River at I-90 (Ditch Road access), Sioux Falls
R10	Big Sioux River at South Western Avenue, Sioux Falls
WQM 64	Big Sioux River at East Falls Park Drive, Sioux Falls
R11	Big Sioux River at North Bahnson, Sioux Falls
WQM 117	Big Sioux River at North Timberline Road, Sioux Falls
R12	Big Sioux River at West Holly Blvd/East Rice Street, Brandon
R13	Big Sioux River at SD Hwy 42, East Sioux Falls
WQM 65	Big Sioux River at US Hwy 18, Canton
WQM 66	Big Sioux River at 488th Avenue, Hudson
WQM 67	Big Sioux River at 302nd Street/CR 13, Hawarden
WQM 32	Big Sioux River at SD Hwy 50, Richland
TBD	Big Sioux River at ???, North Sioux City
T18	Skunk Creek at 244th Street, Chester
SK-1	Skunk Creek at 247th Street, Colton
SK-2	Skunk Creek at 248th Street, Colton
SK-3	Skunk Creek at 249th Street, Colton
SK-4	Skunk Creek at 250th Street, Colton
T18.5	Skunk Creek at Grand Meadow Street, Lyons
T19	Colton Creek at Grand Meadow Street, Lyons
T20	West Branch Skunk Creek at Van Denmark Avenue, Hartford
T21	Skunk Creek at 467th Avenue, Ellis
T22	Willow Creek at 262nd Street, Sioux Falls
T23	Skunk Creek at Marion Road, Sioux Falls

Table 5.6 lists the parameters that will be measured to assess the water quality at each site. The South Dakota State Health Laboratory at Pierre, South Dakota, will analyze all water samples. Data collected will be sent to DENR for entry into the STORET database. Other sites sampled during the assessment study are currently monitored by the South Dakota Department of Environment and Natural Resources as a part of their state-wide ambient water quality monitoring network. Data from these sites (listed in Tables 5.5 and 5.6) will also be used to assess project impacts.

Table 5.6. In-stream Parameters to be Measured.

<u>Physical/Field Parameters</u>	<u>Chemical/Biological Parameters</u>
Water Temperature	Nitrate-Nitrogen
Air Temperature	Total suspended solids
Dissolved oxygen	E.coli bacteria
Field pH	
Specific conductance	

The South Dakota Association of Conservation Districts (SDACD) with technical support from East Dakota Water Development District (EDWDD), and the SD Department of Environment and Natural Resources, will develop a project-specific sampling and analysis plan (SAP) for this project utilizing existing state standard operating procedures. The Standard Operating Procedures Manual for Field Samplers (SAP), developed by the State of South Dakota Department of Environment and Natural Resources - Water Resource Assistance Program, will be used to guide all sampling and analysis conducted during the Big Sioux River Watershed Project. A copy of this document will be provided to the project coordinator. Training to assure competence in carrying out the procedures set forth in this document that pertain to this project will be provided to the coordinator and any other involved personnel prior to the start of the project.

5.2 SDACD will monitor project progress based on project milestones and include progress in an annual project report. Progress to meet milestones will include a financial accounting of funds, and the source of funds expended on each milestone or project task. SDACD, in conjunction with EDWDD, will monitor, determine and report on load reductions accomplished as a result of project activities.

The effectiveness of BMPs installed relative to improvements in water quality will be evaluated using tools available from project partners such as:

- Assessment of feedlots for loading (before and after construction);
- Sheet, rill, and gully erosion formulas for soil loss and transport (RUSLE2);
- STEPL model for estimating on site load reductions; and
- HSPF model for changes in loadings due to BMP installation.

In-stream sampling will be conducted at multiple sites within the Big Sioux River watershed each year (see Tables 5.5), with 14 sets of samples collected each year. Proposed water sampling includes the required quality control and quality assurance samples, and will be conducted according to procedures identified in the SAP, and will include the standard in-stream biological, chemical, and physical attributes. Using previously monitored sites, for which data already exist, will allow data to be collected for this project to evaluate useful water quality trend information.

Local support and partner contributions will be tracked through records of landowner time and financial contributions, and through attendance records at annual tours, informational meetings, and project coordinator presentations and contacts.

5.3 The SDACD will be responsible for collecting, storing, and managing data collected during implementation of this project. South Dakota DENR will provide technical assistance and guidance to assist SDACD to set-up the appropriate record systems and computer software for project data collected. Data collected through the in-stream water sampling will be forwarded to South Dakota DENR for entry into the STORET database.

5.4 The SDACD will utilize the South Dakota DENR for technical assistance and training on which models to use and how to use them. It is anticipated that HSPF and STEPL models will be used to evaluate the impact of BMP installation in the watershed.

5.5 The major activities of this project will involve a contract with landowners for operation and maintenance of all BMPs, to include contracts for the proposed in-stream restoration actions. The operation and maintenance section of these contracts will specify the BMPs life span for maintenance and who is responsible for maintenance and operation.

The Moody Conservation District is responsible to ensure O&M agreements are implemented. The Moody Conservation District, EDWDD, the City of Sioux Falls, and other stakeholders will continue to pursue efforts to identify, fund, and implement needed O&M, as well as other additional improvements needed for the Big Sioux River Watershed beyond this proposal’s grant period. This proposal is part of an anticipated multi-segment program to fully implement the necessary measures to meet the TMDL requirements.

6.0 BUDGET

Table 6.7. Big Sioux River Watershed Project Budget Funding By Source

<u>Funding Sources</u>	<u>Funding Source Expenditures</u>	<u>Percentage</u>
EPA Section 319 (Current Request)	\$ 600,000	6.5%
EPA Section 319 (Future Request)	\$ 400,000	4.4%
East Dakota Water Development District	\$ 15,000	0.2%
USDA	\$ 2,098,100	22.9%
Local Cash & In-kind Services	\$ 2,108,450	23%
Conservation Districts	\$ 24,000	0.3%
RCPP	\$ 1,842,550	20.1%
City of Sioux Falls SRF-NPS Funds	\$ 2,072,300	22.6%
Total	\$ 9,160,400	100%

Table 6.8 Budget
Big Sioux River Watershed Implementation Project Segment 3

5 year Proposal July 1, 2015 to June 30, 2020	RCPP Combined Project Expenses						Project Funding					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total	FY 2015 319-EPA Grant	FUTURE 319-EPA Grant	USDA	Local	City of Sioux Falls (SRF-NPS)	RCPP
Project Personnel and Administration												
Project Coordinator (1.5 FTE)	\$104,000	\$107,000	\$112,100	\$115,000	\$120,000	\$558,100	\$166,975	\$112,075				\$279,050
Lodging/Meals/Expenses	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000	\$3,000	\$2,000				
Travel	\$17,000	\$18,000	\$18,000	\$19,000	\$18,000	\$90,000	\$53,000	\$37,000				
Computer Support	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$2,500	\$10,000	\$12,500			
Office Supplies/Postage/Telephone	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000	\$3,000	\$2,000				
Office Space	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$20,000	\$2,000	\$8,000	\$10,000			
Contract Management (SDACD)	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$15,000	\$9,000	\$6,000				
Project Management (Sponsor & Advisory Board)	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000				\$10,000		
Clerical Assistance - (CDs 200 hrs @ \$30)	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000	\$3,000	\$3,000		\$4,000		
Technical Assistance (CDs 500 hrs @ \$30)	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$5,000	\$10,000		\$10,000		
*Contract Management (SECOG)	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000					\$25,000	
Equipment		\$15,000				\$15,000		\$3,000				
Sub-Total	\$149,000	\$168,000	\$158,100	\$162,000	\$166,000	\$803,100	\$259,475	\$193,075	\$22,500	\$24,000	\$25,000	\$279,050
Objective 1 - Best Management Practices												
Task 1. Livestock Nutrient Management												
Design & Nutrient Plans of 13 Animal Waste Facilities (13 systems @ \$21,000 each)	\$63,000	\$84,000	\$84,000	\$42,000		\$273,000	\$18,225	\$18,225	\$168,000	\$38,550	\$30,000	
13 Ag. Waste Systems @ \$400,000 each		\$1,200,000	\$1,600,000	\$1,600,000	\$800,000	\$5,200,000	\$100,000	\$50,000	\$1,750,000	\$1,800,000	\$325,000	\$1,175,000
Nutrient Management Plan Development (13 @ \$4000)		\$12,000	\$16,000	\$16,000	\$8,000	\$52,000	\$5,500	\$1,500	\$34,000	\$11,000		
Sub-Total	\$63,000	\$1,296,000	\$1,700,000	\$1,658,000	\$808,000	\$5,525,000	\$123,725	\$69,725	\$1,952,000	\$1,849,550	\$355,000	\$1,175,000
Task 2. Riparian Area Protection												
Riparian Area Management Program, 43 acres @ \$1,600/acre	\$13,600	\$13,800	\$13,800	\$13,800	\$13,800	\$68,800	\$23,800	\$10,200			\$34,800	
Seasonal Riparian Area Management, 1,700 acres for 15 years @ \$900/acre	\$306,000	\$306,000	\$306,000	\$306,000	\$306,000	\$1,530,000	\$131,000	\$69,000			\$1,330,000	
Grazing management system (10 @ \$20,000)	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$200,000	\$10,000	\$15,000	\$50,000	\$50,000	\$25,000	\$50,000
Water developments - wells, pumps, pipe lines (20 @ \$10,000/development)	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$200,000	\$5,000	\$5,000	\$50,000	\$50,000	\$40,000	\$50,000
Bank Stabilization Engineering	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$125,000					\$62,500	\$62,500
Bank Stabilization, 5,000 linear feet @ \$100/ft	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000				\$100,000	\$200,000	\$200,000
Polinator Habitat 15 acres @ \$1,000/acre	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$15,000			\$4,000	\$1,000		\$10,000
Sub-Total	\$527,600	\$527,800	\$527,800	\$527,800	\$527,800	\$2,638,800	\$169,800	\$99,200	\$104,000	\$201,000	\$1,692,300	\$372,500
Task 3. Cropland Best Management Practices												
Terrace Restoration - Critical Area Planting, 10,000 feet @ 1.75/ft	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$17,500	\$9,000	\$3,500		\$5,000		
Grassed Waterways, 10,000 feet @ \$1.70/ft	\$3,400	\$3,400	\$3,400	\$3,400	\$3,400	\$17,000			\$15,300	\$1,700		
Filter Strips, 20 acres @ \$100/ac	\$400	\$400	\$400	\$400	\$400	\$2,000			\$1,800	\$200		
Cover Crops, 300 acres @ \$40/ac	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$12,000						\$12,000
Polinator Habitat 5 acres @ \$1,500/acre	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$7,500			\$2,500	\$1,000		\$4,000
Sub-Total	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$56,000	\$9,000	\$3,500	\$19,600	\$7,900		\$16,000
Objective 2 - Information & Education/Public Participation												
Task 4. Public Outreach												
News releases, Informational meetings, mailings	\$11,250	\$16,250	\$15,000	\$15,000	\$15,000	\$72,500	\$10,000	\$12,500		\$50,000		
Create Web site links	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$6,250	\$3,000	\$3,250				
Sub-Total	\$12,500	\$17,500	\$16,250	\$16,250	\$16,250	\$78,750	\$13,000	\$15,750		\$50,000		
Objective 3 - Monitoring and Evaluation												
Task 5. Water Quality Monitoring												
WQ Monitoring -600 @ \$35 each and Labor	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000	\$20,000	\$15,000		\$15,000		
QA/QC - 150 @ \$35 each	\$1,750	\$1,750	\$1,750	\$1,750	\$1,750	\$8,750	\$5,000	\$3,750				
Sub-Total	\$11,750	\$11,750	\$11,750	\$11,750	\$11,750	\$58,750	\$25,000	\$18,750		\$15,000		
Totals	\$775,050	\$2,032,250	\$2,425,100	\$2,387,000	\$1,541,000	\$9,160,400	\$600,000	\$400,000	\$2,098,100	\$2,147,450	\$2,072,300	\$1,842,550

7.0 PUBLIC INVOLVEMENT

7.1 A steering committee (project coordination team) will meet at least quarterly and provide input for project management and coordination of resources to the Moody Conservation District, and will consist of representatives from local, state, and federal stakeholder organizations.

The Moody County Conservation District, City of Sioux Falls, and SDACD, through completion of Objective 2 (Information and Education) of this proposal, will provide information to the public through progress reports, supplemental reports to existing regional newsletters, tours, news releases, annual informational presentations and public service announcements to stakeholder groups.

8.0 THREATENED AND ENDANGERED SPECIES

There are several state and/or federally threatened or endangered species listed as present or potentially present in the Central Big Sioux River watershed. They are listed below in Table 8.9.

Table 8.9: Endangered and Threatened Species of the CBSR Watershed.

<u>Name</u>	<u>Scientific Name</u>	<u>Listing Status</u>
Whooping crane	<i>Grus americana</i>	Federally endangered (FE), State endangered (SE)
Bald eagle	<i>Haliaeetus leucocephalus</i>	Federally threatened (FT),
Piping plover	<i>Charadrius melodus</i>	FT, State threatened (ST)
Topeka shiner*	<i>Notropis topeka</i>	FE
Central mudminnow	<i>Umbra limi</i>	SE
Trout perch*	<i>Percopsis omiscomaycus</i>	ST
Northern redbelly dace	<i>hoxinus eos</i>	ST
Banded killfish	<i>Fundulus diaphanus</i>	SE
American burying beetle	<i>Nicrophorus americanus</i>	FE
Western prairie fringed orchid	<i>Platanthera praeclara</i>	FT
Blanding's turtle	<i>Emydoidea blandingii</i>	SE
Spiny softshell turtle	<i>Apalone spinifera</i>	ST
Northern redbelly snake	<i>Storeria occipitomaculata</i>	ST
Lined snake	<i>Tropidclonion lineatum</i>	SE
Black-footed ferret	<i>Mustela nigripes</i>	FE, SE

* - encountered during assessment project.

Only two of the threatened or endangered species were encountered during the Central Big Sioux River Assessment Project; however, care should be taken when implementing best management practices in the Big Sioux River Watershed that habitat for all listed species is not disturbed.

The procedures that will be followed to ensure the project will not adversely affect threatened and endangered species are based on the following premises:

1. The best management practices to be implemented will promote the improvement of water quality which will benefit threatened and endangered species that depend on water.
2. The occurrence of migratory endangered species is expected to be transitory, and if they are present project activities will cease until they have left the area.

The precautions that will be taken with respect to selected threatened and endangered species that could be found in the area are as follows:

1. Threatened and endangered fish species (Topeka shiner & Trout perch) - No in-stream BMPs are planned for water bodies (primarily tributary streams) in which these species have been found. No in-stream activity will be allowed during the breeding seasons for each species in river reaches near known occurrences. If the species are observed at any project work site, all mechanical activities at the site will be suspended. The South Dakota State Management Plan for Topeka shiners will be followed as required.

2. Bald Eagle - The bald eagle can be found near water, primarily on river systems, large lakes, reservoirs, and coastal areas. Bald eagles typically prefer large trees for perching and roosting. As there were no confirmed sightings of bald eagles within the Central Big Sioux River watershed, little or no impact to the species should occur. Best management practices should avoid the destruction of large trees that may be used as bald eagle perches, particularly if an eagle is observed using a tree as a perch or roost. No project activities are planned that will disturb possible nesting sites or reduce food sources. If any actions become necessary during the project that might impact bald eagles that are in or visit the area, the sponsor or its agent will contact DENR for approval to complete the action before proceeding. If a bald eagle(s) is observed at any project work site, all mechanical activities at the site will be suspended until the bird(s) leaves the site under its own volition.