Belle Fourche River Watershed Management and Project Implementation Plan Segment 7

319 Watershed Project
February 1, 2015

Sponsored By:

Belle Fourche River Watershed Partnership

Submitted to:

South Dakota Department of
Environment and Natural Resources
Pierre, South Dakota 57501

PROJECT SUMMARY SHEET

PROJECT TITLE: Belle Fourche River Watershed Management and Project Implementation Plan Segment 7

NAME AND ADDRESS OF LEAD PROJECT SPONSOR:

Belle Fourche River Watershed Partnership
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STATE: South Dakota **WATERSHED**: Belle Fourche River Watershed

HYDROLOGIC UNIT CODE: 101202

HIGH PRIORITY WATERSHED (yes/no) Yes

PROJECT TYPES: [ ] BASE [X] WATERSHED [ ] GROUNDWATER [ ] I&E

WATERBODY TYPES	NPS CATEGORY
[X] GROUNDWATER	[X] AGRICULTURE
[X] LAKES/RESERVOIRS	[ ] URBAN RUNOFF
[X] RIVERS	[ ] SILVICULTURE
[X] STREAMS	[ ] CONSTRUCTION
[X] WETLANDS	[ ]RESOURCE EXTRACTION
[ ] OTHER	[ ] HYDRAULIC MODIFICATION
	[ ] OTHER

Project Location: Latitude: 45 N **Longitude:** –101 W

SUMMARIZATION OF GOALS: The original project goal is to bring the Belle Fourche River into compliance for total suspended solids (TSS) and *Escherichia coli* (*E. coli*) by implementing the recommended Best Management Practices (BMPs) by 2014 and implementing additional BMP recommendations from other Total Maximum Daily Loads (TMDLs) studies for waterbodies within the watershed as they become available. This project will exceed the 2014 timeline, and a new 10-year plan has been developed to analyze the effectiveness of BMP implementation to focus the efforts of the project on securing the compliance of the Belle Fourche River with its assigned beneficial uses. A TMDL for *E. coli* has been approved by the U.S. Environmental Protection Agency (EPA), and this project segment will continue implementing BMPs that target *E. coli* reduction in the upper reach of the Belle Fourche River. The goals of this project segment, as set forth in the Belle Fourche River Watershed TMDL study includes:

- Continue implementing BMPs in the watershed to reduce TSS by 14 milligrams/liter (mg/L) below the Belle Fourche Reservoir and 9 mg/L above the Belle Fourche River Reservoir.
- Continue implementing of BMPs to reduce *E. coli* in the Belle Fourche River.
- Continue public education and outreach programs to stakeholders within the Belle Fourche River Watershed.
- Continue tracking the progress made toward reaching the goals of the TMDL to ensure that the BMPs are effective and that the proper BMPs are implemented.

PROJECT DESCRIPTION: The Belle Fourche River Watershed Partnership is the project sponsor for this 2-year project. This is the seventh segment that addresses seven TMDLs. Completed activities

planned for this segment will begin implementing BMPs that reduce *E. coli* and advance the BMP implementation for TSS pollutants to 71 percent complete. These BMPs include: (1) installing irrigation sprinkler systems, (2) implementing grazing management systems, (3) installing riparian vegetation improvements, (4) implementing clean water diversion, and (5) relocating livestock feeding grounds.

FISCAL YEAR	2015–2017
319 FUNDS:	$793,000
TOTAL PROJECT COST:	$2,516,900
MATCH:	$876,500
319 FUNDED FULL-TIME PERSONNEL:	2

2.0 STATEMENT OF NEED

2.1 The Belle Fourche River Watershed Partnership (BFRWP) developed and implemented an assessment project to determine the Total Maximum Daily Load (TMDL) for the Belle Fourche River. The project started in April 2001. The purpose of the assessment was to (1) assess the current physical, chemical, and biological integrity of the Belle Fourche River and its tributaries; (2) determine the sources of total suspended solids (TSS) in the Belle Fourche River Watershed; and (3) define management prescriptions for identified nonpoint-source critical areas in the watershed. The draft TMDL was completed during 2003 and approved by the U.S. Environmental Protection Agency (EPA) in 2005. The TMDL report includes the Belle Fourche River and Horse Creek. The TMDL approved by the EPA addresses a cluster of TMDLs.

The Belle Fourche River is identified in the 1998 and 2002 *South Dakota 303(d) Waterbody Lists* and the 2004 and 2006 *Integrated Report for Surface Water Quality Assessment* (IR) as impaired because of elevated TSS concentrations. According to the 2006 IR, the Belle Fourche River from the Wyoming border to the Cheyenne River, South Dakota, failed to support its assigned uses because of high TSS concentrations. In the report, agricultural activities were listed as a probable source of occasional impairment. This report also states that a natural source of TSS may be the erosion of exposed shale beds that lie along the river and its tributaries. The 2008 IR shows that all segments of the Belle Fourche River, with the exception of the segment from the Wyoming border to Fruitdale, were delisted after water-quality standards for TSS were met. The 2010 IR reports that four out of the five stream segments are listed as nonsupporting for TSS warm-water permanent fish life assigned beneficial use. The 2012 IR reports all segments are listed for TSS and two segments are listed for fecal coliform and *E. coli*. Table 2-1 contains a summary of the TMDL segments within the Belle Fourche River Watershed that are listed as impaired for TSS, fecal coliform, *E. coli*, temperature, and pH in the 2014 IR. The table also lists the impaired beneficial use, impairment parameter, water-quality data, and possible source.

Horse Creek was listed in the 1998 impaired waterbody list for TSS and that was later determined to be a listing error. The Horse Creek listing was corrected to conductivity during 2002. During this assessment, approximately 10 percent of the samples collected from Horse Creek exceeded the water-quality standard for TSS. The 2012 IR lists Horse Creek as nonsupporting for conductivity and delisted for TSS. The 2014 IR does not list Horse Creek as impaired. The TMDL report for Horse Creek includes both TSS and conductivity.

The Belle Fourche River from the Wyoming border to the Redwater River was first listed for pathogens in the 2002 South Dakota Report to Congress 305 (b) Water Quality Assessment and continued to be listed for fecal coliform in successive IRs (2004, 2006, 2008, and 2010) failing to support its immersion recreation beneficial use because of elevated levels of *E. coli*. The South Dakota Department of Environment and Natural Resources (SD DENR) developed a TMDL in 2012 that identified livestock, wildlife, and stormwater from the city of Belle Fourche as potential sources of *E. coli* impairments in the watershed.

Implementation of the TSS BMPs recommended in the Belle Fourche River TMDL began during 2004. The first year of implementation included funding from local ranchers and farmers, BFRWP, Lawrence County, Belle Fourche Irrigation District (BFID), Wyoming Department of Environmental Quality (WY DEQ), National Resource Conservation Service (NRCS), Corps of Engineers, Bureau of Reclamation (BOR), and the U.S. Geological Survey (USGS). Two products of the project

Table 2-1. Summary of the Belle Fourche River Watershed Exceedance Water-Quality Data From 2014 Integrated Report

Stream	Stream Reach	Beneficial Use	Impairment Parameter	Water-Quality Criteria	Source
Bear Butte Creek	Headwaters to Strawberry Creek	Cold-Water Permanent Fish Life	Water Temperature (°F)	<65°F	NA
Bear Butte Creek	Strawberry Creek to S2, T4N, R4E	Cold-Water Permanent Fish Life	Water Temperature (°F)	<65°F	NA
Belle Fourche River	Wyoming Border to Redwater River, South Dakota	Immersion Recreation	Fecal Coliform (per/100 mL)	200[(a)]/400[(b)]	Wildlife, Livestock, Urban Runoff
		Immersion Recreation	*E. coli*	126[(a)]/235[(b)]	Wildlife, Livestock, Urban Runoff
		Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	Irrigated Crop Production
Belle Fourche River	Redwater River to Whitewood Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	NA
Belle Fourche River	Whitewood Creek to Willow Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	NA
Belle Fourche River	Willow Creek to Alkali Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	NA
Belle Fourche River	Alkali Creek to Mouth	Immersion Recreation	Fecal Coliform (per/100 mL)	200[(a)]/400[(b)]	Livestock
		Immersion Recreation	*E. coli*	126[(a)]/235[(b)]	Livestock
		Limited Contact Recreation	Fecal Coliform (per/100 mL)	1,000[(a)]/2,000[(b)]	Livestock
		Limited Contact Recreation	*E. coli*	630[(a)]/1,178[(b)]	Livestock
		Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	NA
Deadwood Creek	Rutabaga Gulch to Whitewood Creek	Immersion Recreation	*E. coli*	126[(a)]/235[(b)]	NA
Strawberry Creek	Bear Butte Creek to S5, T4N, R4E	Fish/Wildlife Prop. Rec. Stock Waters	Cadmium (mg/L)	(c)	Mining Impacts
Whitewood Creek	Deadwood Creek to Spruce Gulch	Immersion Recreation	*E. coli*	126[(a)]/235[(b)]	Combined Sewer Overflows
Whitewood Creek	Spruce Gulch to Sandy Creek	Immersion Recreation	*E. coli*	126[(a)]/235[(b)]	NA
Whitewood Creek	Sandy Creek to I-90	Cold-Water Marginal Fish Life	pH	6.5–8.8	Natural Sources
Whitewood Creek	I-90 to Crow Creek	Warm-Water Permanent Fish Life	pH	6.5–9.0	NA
		Limited Contact Recreation	*E. coli*	126(a)/235(b)	NA
Whitewood Creek	Crow Creek to Mouth	Warm-Water Permanent Fish Life	TSS (mg/L)	90[(a)]/158[(b)]	NA

(a) 30-day average.
(b) Daily maximum.
(c) Cadmium concentration < (1.136672 – [(ln(hardness) × 0.041838] × exp[1.128 × (ln(hardness)] – 3.828).

were the *Ten-Year Belle Fourche River Watershed Strategic Implementation Plan* (10-Year Plan) and the *Belle Fourche Irrigation District Water Conservation Plan* (5-Year Plan). These two plans outline the work that has been completed to date. Currently, a new 10-year plan is being developed to guide the project in future years. In the reports, the associated TSS and nonused water savings are presented for each BMP planned. Table 2-2 list the BMPs installed above and below the reservoir to date. The total planned number of each BMP to be installed in this segment are also shown. Segments 1 through 5 were completed on schedule and within budget. Segment 6 is on schedule to be completed in June 2015 within the proposed budget.

Table 2-2. Best Management Practices Installed and Scheduled Above and Below the Belle Fourche Reservoir

Best Management Practice	Planned for Segment 7	Amount Implemented October 2012	Total Amount Scheduled From 10-Year Plan
Flow Automation Units (number)	0	39	42
Upgraded Water Card and Water Order System	Complete	Phase III	Three Phases
Portable Stage/Flow-Measuring Devices (number)	0	6	15
Real-Time Stage Flow-Measuring Devices (number)	0	9	15
Alternative Keyhole Water Delivery Study	0	0	1
Alternative Keyhole Water Supply Method	0	0	1
Line Open Canals and Laterals (feet)	0	2,600	16,000
Replace Open Canals and Laterals With Pipelines (feet)	0	14,514	25,000
Nonused Water Storage Pond (number)	0	0	3
Inlet Canal Lining (feet)	0	7,760	10,560
Pipeline Projects Delivering Water to Fields (feet)	15,000	58,082	9,000
Irrigation Sprinkler Systems (number)	12	70	36
Managed Riparian Grazing (acres)	1,500	30,388	34,000
Public Meetings (number)	8	39	40
Project Tours (number)	2	10	8

The 10-Year Plan includes a TSS reduction schedule. The BMPs installed to date have resulted in an estimated 119 milligrams per liter (mg/L) above the reservoir and 90 mg/L below the reservoir for a total of 164 mg/L reduction in TSS (Table 2-3). The goal of the 10-Year Plan was to reduce TSS by 357 mg/L, including 249 mg/L above and 108 mg/L below the reservoir. A reduction of 209 mg/L translates to 59 percent achievement of the goal since the project was initiated. Currently, a new 10-year plan is being developed that focuses implementation efforts on addressing TSS issues in the watershed and incorporating *E. coli* BMPs.

2.2 The Belle Fourche River Watershed is shown in Figure 2-1. The ecoregions in the watershed include Black Hills Foothills, Black Hills Plateau, Black Hills Core Highlands, River Breaks, Semiarid Pierre Shale Plains, Dense Clay Prairie, and Missouri Plateau. The Belle Fourche River is a tributary to the Cheyenne River. Currently, 14 stream segments in the Belle Fourche River Watershed are listed in the South Dakota 2012 IR as impairment-related TMDL waters. These include Bear Butte Creek (two listings), Belle Fourche River (five listings), Redwater River (one listing), Strawberry Creek (one listing), and Whitewood Creek (five listings).

Table 2-3. Total Suspended Solids Reduction

Location of Reductions	TSS Reductions to Date (mg/L)	TSS Reductions Planned for Segment 7 (mg/L)	Planned TSS Reductions in the 10–Year Plan (mg/L)
Above the Reservoir	123	9	249
Below the Reservoir	108	14	108
Combined TSS Reductions	231	23	357

The BMPs that will be installed during this project segment are consistent with the schedules in the 10-Year Watershed Plan and the 5-Year Irrigation Plan. Currently, a new 10-year plan is being developed that focuses BMP implementation on reducing TSS and incorporating *E. coli*. The BMPs planned are described in Section 3.0 of this proposal and will reduce the TSS in the Belle Fourche River by approximately 9 mg/L and 14 mg/L above and below the Belle Fourche Reservoir, respectively (Table 2-3). This level of reduction is consistent with what is presented in the 10-Year Plan.

The surface area of the South Dakota portion of the Belle Fourche River encompasses approximately 2,103,040 acres and includes Hydraulic Units 10120201, 10120202, and 10120203. The city of Spearfish (population 8,606) is the largest municipality located in the Belle Fourche River Watershed. Other small communities in the watershed include Belle Fourche (population 4,565), Sturgis (population 4,442), Lead (population 3,027), Deadwood (population 1,380), Newell (population 646), Nisland (population 204), and Fruitdale (population 62).

Land use in the watershed is primarily livestock grazing with some cropland and a few urban and suburban areas. Wheat, alfalfa, native and tame grasses, and hay are the main crops. Corn, wheat, and barley are grown within the BFID. Some winter animal feeding areas are located in the watershed. Gold mining, while reduced in scope from the past, is conducted in some headwater areas of the watershed, and some of the land is used for silviculture. Approximately 11 percent of the watershed is U.S. Forest Service land (primarily the Black Hills National Forest) and 4 percent is Bureau of Land Management land.

Major soil associations found in the watershed include Winler-Lismas, Pierre-Kyle, Grummit-Shale, Epsie, Midway-Penrose, Cabbart-Absher, Butche-Colby, Arvada-Stetter, Lohmiller-Glenberg-Haverson, Caputa-Satanta, Delphill-Assinniboine, Nunn-Satanta-Zigweid, Blackpipe-Savo-Manvel, Blackpipe-Assinniboine-Savo, Canyon-Lakoa-Maitland, Tilford-Nevee, St. Onge-Keith, Lohmiller-Glenberg, Winler-Lismas-Swanboy, Kyle-Pierre-Hisle, Samsil-Lismas-Pierre, Nevee-Vale-Tilford, Butche-Satanta-Boneek, Nunn-Kyle-Pierre, Barnum-Swint-St. Onge, Grummit-Snomo-Rock, Paunsaugunt-Rock, Lakoa-Maitland, and Citadel-Vanocker-Grizzly.

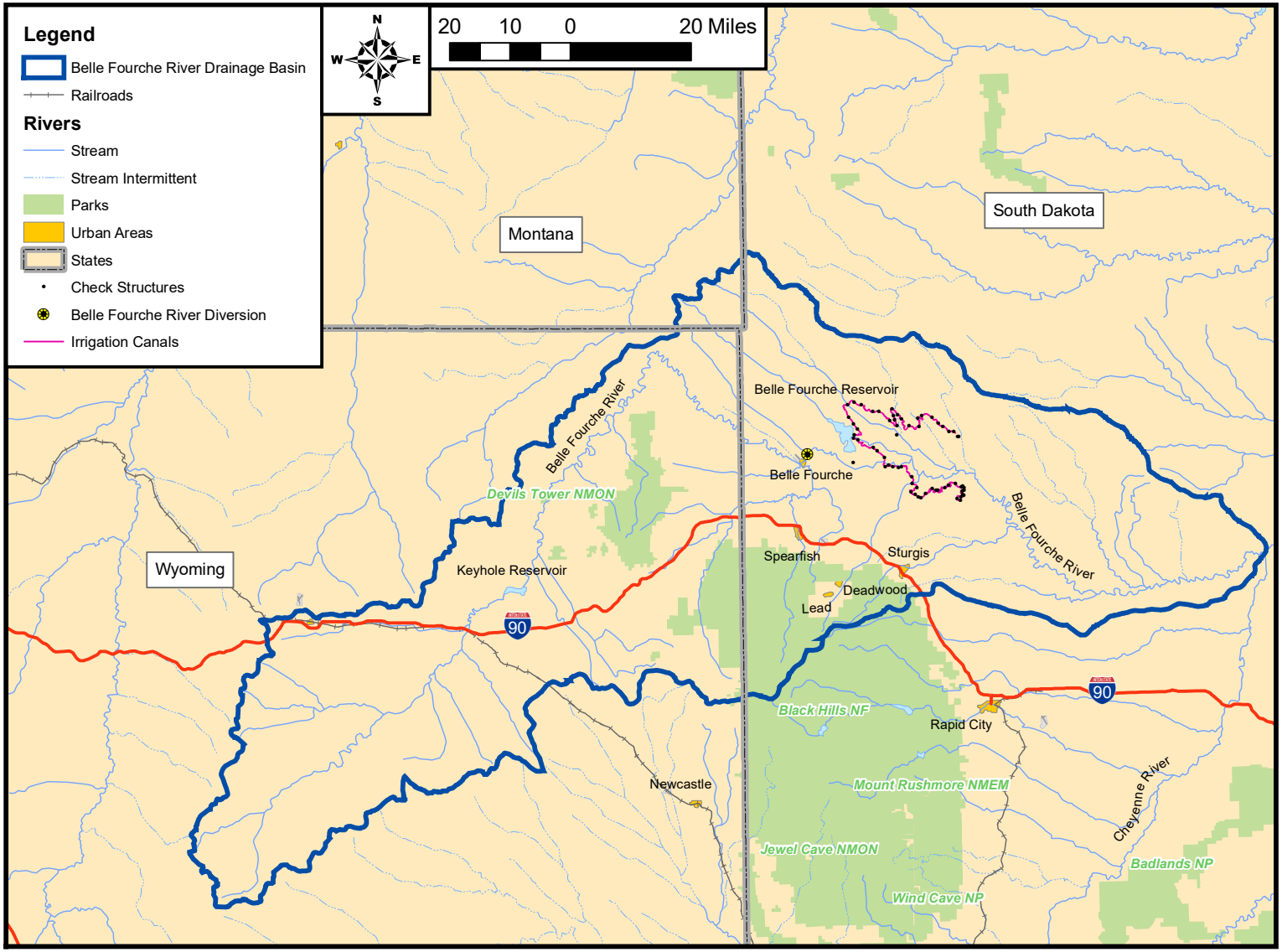

Figure 2-1. Location of the Belle Fourche River Watershed.

The average annual precipitation in the Belle Fourche River Watershed ranges from 15 to 29 inches, and 70 percent of this is usually received from April through September. Tornadoes and severe thunderstorms strike occasionally. These storms are local, of short duration, and occasionally produce heavy rainfall events. The average seasonal snowfall ranges from 155 inches in the higher elevations of the western part of the watershed to 23 inches per year in the eastern portion of the watershed. The average water allocation to the BFID is approximately 15 inches. The water added to the fields from irrigation nearly doubles the amount of water available for crop production.

The landscape in the watershed is characterized by prairies with some mountains in the south and west. Land elevation ranges from approximately 2,500 feet above mean sea level (msl) to approximately 7,071 msl. The Black Hills are steep, and the hills near the Cheyenne River are not as steep.

2.3 The Belle Fourche River Watershed within South Dakota encompasses over 2 million acres. TSS are contributed from natural, urban, agriculture, forest, and mining sources. The TMDL study identified that the primary contributor of TSS to the Belle Fourche River and Horse Creek are the natural bank sloughing, quantity of nonused irrigation water discharged to the natural waterways, and riparian habitat impairment. Stream entrenchment and bank failure are responsible for approximately 75 percent of the TSS in the Belle Fourche River system. Stream energy causes natural bank failure (particularly in the eastern portion of the watershed). These areas are dominated by high banks composed primarily of clay soils that supply suspended solids to the channel. Riparian areas and improper grazing or overgrazing in the uplands facilitate natural bank failure and add to TSS in the watershed. Increased quantities of water resulting from the nonused irrigation flows are the major driving cause of the channel incision and result in additional bank failures and resultant suspended solids.

Irrigation and return-flow, nonused irrigation water are responsible for approximately 20 percent of the TSS in the Belle Fourche River system. Much of the irrigation in the watershed is flood irrigation. This type of irrigation results in sediments that are mobilized by three processes: (1) tail water/runoff crossing fields, (2) water in the canals and laterals, and (3) water in the intermittent streams carrying tail water/runoff to the perennial streams within the watershed. Rangeland erosion contributes the remaining 5 percent of the TSS load.

The *E. coli* TMDL study identified livestock, wildlife, and stormwater originating from the city of Belle Fourche as the contributors to excess loading in the upper reach of the Belle Fourche River. To meet the standard for immersion recreation, *E. coli* loads need to be reduced 85, 94, 13, 1, and 83 percent during high, moist, midrange, dry, and low flow, respectively.

3.0 PROJECT DESCRIPTION

3.1 GOALS

The project goal is to bring the Belle Fourche River into compliance for its warm-water permanent fish life and immersion recreation beneficial uses by implementing the BMPs included in the 10-year implementation plan and by implementing additional BMP recommendations from the *E. coli* TMDL in the upper reach of the Belle Fourche River. The goals of this project segment, as set forth in the Belle Fourche River TSS and *E. coli* TMDL studies, include the following:

- Continue implementing BMPs in the watershed to reduce TSS by 14 milligrams/liter (mg/L) below the Belle Fourche Reservoir and 9 mg/L above the Belle Fourche River Reservoir.

- Continue implementing of BMPs to reduce E. coli in the Belle Fourche River.
- Continue public education and outreach programs to stakeholders within the Belle Fourche River Watershed.
- Continue tracking the progress made toward reaching the goals of the TMDL to ensure that the BMPs are effective and that the proper BMPs are implemented.

3.2 OBJECTIVES AND TASKS

The strategy outlined in the Belle Fourche River Watershed Implementation Plan is to progressively implement BMPs, such as water management and grazing management systems in the riparian areas, within the Belle Fourche River Watershed to reduce TSS in Horse Creek and the Belle Fourche River. This project segment focuses on BMPs that reduce the amount of nonused irrigation water that is discharged to the local waterways from the delivery and application of irrigation water as well as riparian vegetation improvement. Baseline and seasonal monitoring will be performed to measure improvement. The project strategy will be reviewed annually to measure overall success to determine adjustments and to obtain funding for the following project segment. Federal, state, and private funding will be used to fund BMPs. A final report will be produced for each 319 project segment that is completed.

Specifically, this project segment will fund the eighth and ninth years of BMP installation in the Belle Fourche River Watershed to continue TSS reduction as well as continue implementing BMPs that target *E. coli* reduction. Additional projects and funding proposals will be submitted during the next 10 years to continue installing BMPs that reduce TSS and *E. coli* to meet the TMDLs.

OBJECTIVE 1: Implement BMPs Recommended in the Belle Fourche River Watershed TMDL to Reduce TSS and *E. coli*

The Belle Fourche River TSS TMDL recommends BMPs that focuses on reducing the amount of nonused irrigation water discharged to the waterway from irrigation as well as implementing riparian vegetation improvements. Nonused water reduction activities include water delivery and water application improvement.

The TMDL states that the amount of nonused water discharged to the local waterways needs to be reduced by 12,000 acre-feet. Implementing BMPs before this project segment has reduced the nonused water discharged to local waterways by 9,834 acre-feet (82 percent of the overall goal).

Task 1 **Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet**

The BFID maintains and operates irrigation facilities for the BOR. The BFID has an active water conservation program. Historically, the program included lining the canals, piping, and operational and maintenance procedures to conserve water. Irrigation significantly impacts the Belle Fourche River, Horse Creek, and other streams within the BFID's 57,000 (+) acres (irrigable land). The impact is primarily from the additional water added to the system during the irrigation season (June–September), and the average TSS concentrations at USGS Gaging Station Sites 06430500 (at the South Dakota-Wyoming border) and USGS 06438000 (upstream of the Cheyenne River) were historically over 2.5 times the 12-month average. For the

same sites, over 95 percent of the load occurred during the irrigation season before the implementation project. Approximately 36 percent of the water lost is attributed to irrigation transportation and operational losses. Transportation losses include seepage and evaporation. Operational losses include overflow from the canals, laterals, and gates/valves into the adjacent waterways.

Approximately 64 percent of the water released from the reservoir was delivered to the field. Approximately 32 percent of the water was used by crops and the rest was lost through evaporation and nonused water discharged to adjacent waterways. This water also carried TSS from the flood-irrigation water in fields. This task will increase the overall irrigation delivery and application efficiency through sprinkler systems, pipelines, and water control and monitoring structures and equipment.

Products:

1. Improved Irrigation Water Delivery and Application.

   The goal for this project segment is to reduce the amount of nonused irrigation water discharged to the surrounding water by 1,085 acre-feet. This will be accomplished by reducing nonused irrigation water from BFID's delivery system and the producers' application systems. The following is an outline of anticipated activities that will be completed to reach the milestone:

   a) Convert 12 flood-irrigation systems to sprinkler-irrigation systems. The total irrigation acres treated will be approximately 940 acres.

      Sprinkler-irrigation systems are more efficient at applying water for irrigation (i.e., they use less water and reduce nonused water). In addition to improved water efficiency, converting flood-irrigation systems to sprinklers decrease the amount of sediment transported through runoff. The TMDL for the Belle Fourche River recommends installing sprinkler-irrigation systems to help reach the goal of reducing the nonused water from the BFID and surrounding area by 12,000 acre-feet. To reach this level of implementation, 319 funds would be required in addition to Environmental Quality Incentives Program (EQIP) funds that are available in the watershed. Approximately 12 sprinkler-irrigation systems will be installed during this segment of implementation. Conversion projects include installing center pivot sprinkler-irrigation systems and an underground pipeline that services the system on acres that have been using flood irrigation. Cost share is based on a docket price per linear foot of sprinkler system and pipeline that services the sprinkler-irrigation system and typically provides approximately 40 percent of the total cost of the project. The BFRWP designates the docket price annually for consistency with the NRCS EQIP docket price. The cost-share amount has been designated to not exceed 50 percent of the total cost of the project. Funds requested in this segment will be used to improve water use efficiency and decrease the amount of sediment transported through runoff on approximately 940 acres.

      – Activity Cost: $1,283,000 319 Cost: $333,000
      – Lead Group: NRCS, Consultants
      – Other Groups: Consultants, Producers
      – Milestone: June 2017, Conversion of flood-irrigation to sprinkler-irrigation systems (12 sprinkler systems) on approximately 940 acres (see the timeline on page 16).

b) The project staff will work with up to 20 (approximately 1,000 acres) fields throughout the Belle Fourche Watershed to help optimize the timing and depth of irrigation deliveries through irrigation scheduling. This project, which was initiated during a national level Conservation Innovation Grant (CIG) funded by the NRCS, will involve installing soil moisture sensors at ⅓ and ⅔ of the crop rooting depth at up to two locations per field. A datalogger will record soil moisture readings periodically throughout the day and will be downloaded once per week by project staff. The results, along with any necessary irrigation timing and depth recommendations, will then be supplied to the individual producers throughout the growing season. This practice has been documented to reduce water application and associated sediment-laden tailwater by up to 50 percent. Cost-share dollars will be supplied to offset the cost of the individual soil moisture sensors and the dataloggers will be reused from the CIG grant.

– Activity Cost: $35,000 319 Cost: $35,000
– Lead Group: Producers, Consultants
– Other Groups: NRCS
– Milestone: June 2017, 1,000 acres treated with irrigation scheduling (see timeline on page 16)

Total Product Cost: $1,318,000 319 Cost: $368,000
Responsible Groups: NRCS, Consultants, Producers

Task 2 **Range and Riparian Area BMP Implementation**

Implementing riparian vegetation improvement projects reduces TSS by up to 70 percent (see the Belle Fourche River TMDL study). This reduction has been in areas where a large majority of the TSS is coming from the adjacent riparian area. In the Belle Fourche River Watershed, it is predicted that riparian vegetation improvement will reduce TSS concentrations by 18 percent. The *E. coli* TMDL study identified that reducing livestock access to streams, protecting unstable stream banks, creating filter strips, and waste management should be implemented to reduce *E. coli* in the upper reach of the Belle Fourche River. The U.S. Department of Agriculture (USDA) cost-share funds will be used to install similar BMPs on upland sites. Installing BMPs in both the riparian and upland sites allows for overall improved grazing management and range condition that will ultimately reduce TSS and *E. coli* concentrations.

Products:

2. Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres.

The focus of this product will be to work with producers who have livestock operations directly impacting riparian areas along the Belle Fourche River or a major tributary. Producers who want to make a change in their grazing or feeding operations to improve their riparian areas and reduce sediment loads will be selected through a ranking process to achieve maximum effectiveness of BMP installation. BMPs used to achieve this goal include livestock deferment, improved grazing systems, livestock watering facilities, fencing, livestock water pipeline, and other facilitating practices. The BFRWP has been successful in working with the NRCS, Game Fish and Parks (SD GF&P), and U.S. Fish and Wildlife Service (USFWS) and will continue to work with these agencies to maximize funding opportunities. In addition, BFRWP consultants will continue to provide technical assistance to

producers who work on riparian improvement projects. EPA funds will be targeted on riparian acres.

The BFRWP has teamed up with the Belle Fourche Weed Management Area Group to assist with a phragmites control and rehabilitation along the Belle Fourche River. Grant writing efforts have provided funding for herbicide control and rehabilitation of the treated areas with native vegetation to stabilize the area. To date project efforts have effectively treated approximately 350 out of 750 acres along the Belle Fourche River. The project is estimated to be complete in the next 2 years, provided grant funding continues. Funding has been provided by Butte and Meade Counties, the South Dakota Conservation Commission, the South Dakota Weed and Pest, and the Wild Turkey Federation.

- Activity Cost: $546,000 319 Cost: $75,000
- Lead Group: NRCS, Consultants, Producers
- Other Groups: NRCS, USFWS, SD GF&P, Conservation Commission, Weed Management Group
- Milestone: June 2017, Contract improvements on approximately 1,500 acres and 25,000 acres of rangelands (see the timeline on page 16).

Total Product Cost: $546,000 319 Cost: $75,000
Responsible Groups: NRCS, Consultants, Producers, USFWS, SD GF&P

OBJECTIVE 2: Conduct Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Project Design, Report Writing, Writing Future Grants, Annual Audit

Public outreach and education is an essential part of this project. Public meetings and workshops keep the community informed and encourage involvement with the BFRWP. Producer implementation, project planning, and record keeping is important for efficient report writing. Grant writing for future projects involving water-quality issues in the watershed will further assist in the BFRWP efforts. Beginning in 2006, an additional $5,076,280 was funded for the watershed through these grant writing efforts.

Task 3 **Project Management and Administration**

Products:

3. Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, and Future Grant Writing.

   Eight public meetings will be held during the project segment. The meetings will update the status of the project and educate and encourage the producers, landowners, and stakeholders to become involved with implementing BMPs. These meetings will provide an opportunity for input from residents in the area. Meeting notifications will be provided through local agencies, mailings, and newspapers. In addition, a public website (www.bellefourchewatershed.com) will be maintained to provide the latest available data and an overview of the project and status of work activities. Public awareness will be further enhanced by annual tours of the watershed, informational booths at local county fairs, and agriculture-related shows demonstrating the BFRWP accomplishments. Educational workshops will be

sponsored during the project and demonstrate innovative approaches to addressing resource concerns in the watershed. The BFRWP's Soil-Quality Demonstration Trailer will be used extensively to demonstrate the effects of soil erosion to agriculture producers, students, and the general public. To date, over 2,500 people have watched the demonstration. Consultants will be responsible for organizing and planning all public outreach and education activities.

Riparian and irrigation implementation projects require collaborating with the producer to complete applications, plan projects, check cultural resources, conduct engineering, check practices once they are complete, and organize and file applications and producer bills. Consultants will work with the NRCS and the Butte County Conservation District to carry out this task.

Grant Reporting and Track System (GRTS) Reports will be completed as required by the SD DENR. A final report will be submitted to the EPA at the conclusion of the project. This report will cover all the work completed during this segment of implementation and the estimated effects the BMPs will have on the water quality in the Belle Fourche River. Additional grants to assist in resolving water-quality issues and support the cost of implementation projects will be written. Over the past several years, the BFRWP has been successful in partnering with the NRCS, South Dakota Department of Agriculture, South Dakota Weed and Pest, Meade County, Butte County, city of Spearfish, and city of Belle Fourche in securing grant funding to further their efforts in water-quality improvement.

- Activity Cost: $320,000 319 Cost: $320,000
- Lead Group: BFRWP
- Other Groups: NRCS, Producers, Consultants, Butte Conservation District
- Milestone: June 2017, two GRTS reports, one final report, two required federal audits, eight public meetings, one website, two watershed tours, two workshops, eight public information booths, and twenty soil-quality demonstrations (see timeline on page 16).

Total Product Cost: $320,000 319 Cost: $320,000
Responsible Groups: BFRWP, NRCS, Producers, Consultants, Butte Conservation District

OBJECTIVE 3: Complete Essential Water-Quality Monitoring

Water-quality monitoring will continue to use a targeted approach. Water-quality data will be collected at sites used during the watershed assessment to formulate the TMDL.

Task 4 **Water-Quality Monitoring to Assess BMPs**

Products:

4. Monitor Water-Quality Improvement.

Water-quality monitoring will use a targeted approach. Water-quality data will be collected at sites used during the watershed assessment to formulate the TMDL. Flow impact on the macrowatershed will be analyzed by using the following USGS stations:

- USGS 06428500 (Belle Fourche River at the South Dakota and Wyoming state line)
- USGS 06436000 (Belle Fourche River near Fruitdale, South Dakota)
- USGS 06437000 (Belle Fourche River near Sturgis, South Dakota)
- USGS 06438000 (Belle Fourche River near Elm Springs, South Dakota)
- USGS 06433000 (Redwater River above Belle Fourche, South Dakota)
- HC01 (Horse Creek above BFID)
- HC02 (Historically called USGS 06436760 Horse Creek above Vale, South Dakota).

Several of the stations are long-term flow measurement sites operated, funded, and maintained by the USGS. The practices installed to reduce the amount of nonused water discharging to the waterways within the irrigation district should be detectable at the Belle Fourche River sites near Sturgis and Elm Springs as well as at the Horse Creek site above Vale. The other recommended sites will allow a water mass balance to be calculated, which will add to the precision of the analysis. *E. coli*, TSS, and conductivity will be measured on a continuous basis at Horse Creek above Vale to provide baseline data that measures water-quality improvements resulting from the nonused water reduction project BMPs implemented within the Horse Creek Watershed.

The SD DENR Surface Water Quality Program has 21 monitoring stations within the watershed. Comparisons will be performed over time by using applicable sites to measure the large-scale changes in water quality.

The USGS will collect water-quality samples from long-term watershed monitoring sites. Biweekly grab samples will be collected at HC01 and HC02 with development of stage/discharge relationships to assess monthly variability, provide a better understanding of the impacts resulting from the BFID delivery system and on-farm delivery inefficiencies, and compare chemical changes over time. A majority of the wastewater from the delivery system and on-farm practices flow directly into Horse Creek. Implementation projects have been, and will continue to be, completed within this region. This station is necessary to fully understand the impact that implementation projects within the BFID have on flow and water quality in Horse Creek.

– Activity Cost: $332,900 319 Cost: $30,000
– Lead Group: USGS, consultants

Total Product Cost: $332,900 319 Cost: $30,000
Responsible Groups: USGS, Consultants, SD DENR
Milestone: report water-quality results (see the timeline on page 16).

4.0 SCHEDULE

The project milestone schedule is shown in Figure 4-1 and is based on work approval by July 2015 and completion by June 2017.

4.1 PERMITS

Before any new construction can begin, required permits will be obtained. An example of a permit that may need to be obtained is the National Environmental Policy Act (NEPA) permit required to perform work on BOR lands. Other required permits may be needed for stormwater or construction work. Additionally, the need for 401 and 404 stream permits will be verified for the riparian work.

4.2 LEAD PROJECT SPONSOR

The BFRWP is the local sponsor for this implementation project and is a 501C(3) nonprofit group. The leaders of the BFRWP include the conservation districts within the watershed and the BFID. The BFRWP was the recipient of past 319 assessment and implementation grants for the Belle Fourche River TMDL.

4.3 OPERATION AND MAINTENANCE QUALITY ASSURANCE

Responsibilities for operation and maintenance of 319 funded BMPs will be provided through conservation district/landowner contracts. Contracts developed for BMP installation will specify operation and maintenance needs, procedures for BMP failure or abandonment, and the life-span of the BMPs terms agreed upon in the contract. The NRCS and consultants will be responsible for completing operation and maintenance scheduling, on-site evaluations, and follow-up with landowners when actions are necessary to ensure BMP operation for its designated life-span.

The NRCS; Farm Service Agency; the Butte, Lawrence, and Elk Creek Conservation Districts; District Supervisors; BOR; and consultants will be responsible for ensuring BMPs cost-shared with the EPA 319 funds are properly installed and maintained. Compliance with BMPs implemented with 319 funds will follow the same rules and regulations as the NRCS' EQIP (these rules are found in Section 515.113 of the EQIP Program Manual). Landowners and operators who do not maintain practices funded by this project for the length of the agreed contract will be required to repay all cost-share funds and any liquidated damages incurred. Conservation district personnel supported by the agent acting on behalf of the BFRWP will be responsible for landowner contacts, developing a landowner/producer mailing list, maintaining records, submitting vouchers and reports, and recording cash and in-kind match. Where BOR funds are used, the BOR will be responsible to ensure that the BMPs are operated and maintained properly for the life of the contract.

5.0 COORDINATION PLAN

5.1 PARTICIPATING GROUPS AND AGENCIES

The BFRWP has been working together for over 11 years and has completed monitoring and evaluation work and submitted a TMDL study for approval. Some of the BMPs recommended in the TMDL have been implemented (one flow automation unit, partial completion of replacing open ditches with pipeline, partial completion of pipeline projects from BFID to fields, partial completion of installation of sprinkler systems, and partial completion of riparian vegetation improvement projects). The following groups/agencies have been participating, and will continue to participate in the Belle Fourche River Watershed implementation project:

Project Timeline		2015							2016												2017					
		June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
OBJECTIVE 1	*Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and E. coli*																									
Task 1.	Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet																									
Product 1	Improve Irrigation Water Delivery and Application																									
Product 1a	Convert 12 Flood irrigation systems to sprinkler-irrigation systems											x	x	x	x	x	x	x								
Product 1b	Irrigation Scheduling																									
Task 2	Range and Riparian Area BMP Implementation																									
Product 2	Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres	x	x	x				x																		
OBJECTIVE 2	Conduct Public Outreach and Eduction, Implementation Record Keeping, Cultural Resources,Project Design, Report Writing, Writing Future Grants, Annual Audit																									
Task 3.	Project Management and Administration																									
Product 3.	Public Outreach and Eduction, Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, Writing Future Grants, Annual Audit									x	x	x					x	x	x							
OBJECTIVE 3.	Complete Essential Water-Quality Monitoring																									
Task 4.	Water-Quality Monitoring to Assess BMPs																									
Product 4.	Water-Quality Monitoring																									

Figure 4-1. Timeline of the Project**.**

- **Butte Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **Belle Fourche Irrigation District (BFID)** – Voting member of the BFRWP, implements many BMPs, provides financial support and match funding.
- **Belle Fourche River Watershed Partnership (BFRWP)** – Local project sponsor.
- **Elk Creek Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **Lawrence County** – Local support, provides funding.
- **Lawrence Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **South Dakota Association of Conservation Districts** – New active participant of BFRWP, full-time effort under the 319 grant program titled *303 (d) Watershed Planning and Assistance Project*.
- **South Dakota Conservation Commission** – Provides financial support.
- **South Dakota Department of Environment and Natural Resources (SD DENR)** – Active participation in BFRWP, provides technical support and financial support.
- **South Dakota Game, Fish and Parks (SD GF&P)** – Participant in BFRWP, provides technical and financial support.
- **South Dakota Grassland Coalition** – Grassland management project, provides financial support.
- **South Dakota School of Mines and Technology (SDSM&T)** – Active participant in the BFRWP, provides technical support through Dr. Kenner and graduate students (SDSM&T performed the initial TMDL study).
- **South Dakota State University (SDSU)** – Provides technical support, West River Ag Center personnel.
- **US Bureau of Reclamation (BOR)** – Active participation in BFRWP, provides technical support through drawings and designs as requested by BFID, provides financial support.
- **US Environmental Protection Agency (EPA)** – Provides 319 and 106 funding and technical guidance.
- **US Geological Survey (USGS)** – Active participant in BFRWP, fieldwork, and provides technical and financial support.
- **US Fish and Wildlife Service (USFWS)** – Participant in BFRWP, provides technical and financial support.
- **US Natural Resources Conservation Service (NRCS)** – Participant in BFRWP, provides technical and financial support.
- **Wyoming Department of Environmental Quality (WY DEQ)** – Provides local support and financial support for flow measurements at the South Dakota-Wyoming state line.

5.2 LETTERS OF SUPPORT

Letters of support have been supplied by local organizations to the SD DENR that support the Belle Fourche River Watershed Assessment Project.

5.3 COORDINATION WITH OTHER PROGRAMS

The BFRWP will continue to coordinate activities with state, federal, and local government agencies through frequent personal communication and quarterly partnership meetings. The SD GF&P, USFWS, NRCS, SD DENR, local organizations, and local government agencies will provide input and involvement in this implantation project. Coordination with these agencies will include work related to other grassland improvement projects and other 303(d) assessment work. Extra coordination with local NRCS personnel will be necessary for the riparian vegetation and irrigation improvement projects.

5.4 SIMILAR ACTIVITIES IN THE WATERSHED

All practices within the Belle Fourche River Watershed are included in the funding table.

6.0 EVALUATION AND MONITORING PLAN

6.1 QUALITY CONTROL AND ASSURANCE

Field data will be collected in accordance with the SD DENR's *Standard Operating Procedures for Field Samplers, Tributary and In-Lake Sampling Techniques*. A minimum of 10 percent (one sample) of all samples collected will be quality assurance/quality control (QA/QC) samples. QA/QC samples will consist of field duplicates or field replicate samples.

6.2 DATA

The data will be provided to the SD DENR. The data and analysis for this project will be documented in a final report that the BFRWP will provide for the SD DENR.

Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) and Hydrological Simulation Program - FORTRAN (HSPF) were used to model the Belle Fourche River Watershed when the TMDL was developed. To develop the TMDL and to determine the necessary load reductions, several BMPs were modeled in these programs to reduce TSS concentrations in the streams within the Belle Fourche River Watershed. The sources of TSS identified were range erosion, irrigation and on-farm waste, free cattle access to streams, riparian degradation, natural geologic processes, hydraulic alteration by irrigation, and reduced stream miles. To understand the progress made in achieving the goals of the TMDL plan, the BFRWP monitors present progress against planned progress in midyear and annual reports (load reductions are reported annually).

Evaluating the project's success in reaching the objectives and goals will be accomplished by (1) comparing the scheduled versus the actual milestone completion dates; (2) comparing the flow rates and chemistry for irrigation water application, delivery, and riparian BMPs; (3) measuring the reduction in nonused water from BFID discharged into streams; and (4) developing a sustainable watershed implementation project measured in part by the participation and approval of additional grant money for BMP implementation. Project monitoring will be reviewed by the BFRWP in quarterly meetings to report progress toward the goals and objectives.

6.3 LONG-TERM OPERATION AND MAINTENANCE FUNDING

The long-term Operation and Maintenance (O&M) funding for irrigation delivery improvements will be funded and maintained by the BFID. Proper management of stream riparian habitat and on-farm

irrigation improvements will be managed and supported financially in part by the NRCS and EQIP funding.

7.0 BUDGET

Table 7-1 defines the acronyms used in Table 7-2. Table 7-2 identifies the funding sources and cash flow during the project. Tables 7-3 and 7-4 present the budget for the 319 funds as well as the matching funds for the project. EPA 319 funds represent less than 30 percent of the total project budget. Table 7-5 shows the total budget, and Table 7-6 summarizes the other funds being spent on the project that cannot be used as matching funds.

Table 7-1. Table of Acronyms

Acronym	Definition
SD DENR	South Dakota Department of Environment and Natural Resources
NRCS EQIP	Natural Resources Conservation Service Environmental Quality Incentives Program
COE	Corps of Engineers
BOR	Bureau of Reclamation
USGS	United States Geological Survey
BFID	Belle Fourche Irrigation District
WY DEQ	Wyoming Department of Environmental Quality

Table 7-2. Cash Flow

Budget	July 2015–June 2016 ($)	July 2016–June 2017 ($)	Total ($)
319 Funds	397,000	396,000	793,000
Subtotal	**397,000**	**396,000**	**793,000**
SD DENR (Water Rights)	35,000	35,000	70,000
NRCS EQIP	159,000	158,000	317,000
COE	7,000	7,000	14,000
BOR	3,500	3,500	7,000
USGS	86,700	86,700	173,400
Other Grants	133,000	133,000	266,000
Subtotal	**424,200**	**423,200**	**847,400**
Matching Funds			
Producer	419,000	419,000	838,000
Lawrence County	7,000	7,000	14,000
BFID	5,250	5,250	10,500
WY DEQ	7,000	7,000	14,000
Subtotal	**438,250**	**438,250**	**876,500**
Total Budget	**1,259,450**	**1,257,450**	**2,516,900**

Table 7-3a. Budget of 319 Funds

Project Description	Consultants ($)	Producer ($)	BFRWP ($)	Butte Conservation District ($)	Totals ($)
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and *E. coli*					
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet					
Product 1. Improved Irrigation Water Delivery and Application					
1a. Convert 12 flood-irrigation systems to sprinkler-irrigation systems		333,000			333,000
1b. Irrigation Scheduling (395 hrs @ $80/hr; 6,000 miles @ $0.56/mile)	35,000				35,000
Task 2. Range and Riparian Area BMP Implementation					
Product 2. Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres		75,000			75,000
Objective 2. Conduct Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Project Design, Report Writing, Writing Future Grants, Annual Audit					
Task 3. Project Management and Administration					
Product 3. Public Outreach, and Education Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, Writing Future Grants, Annual Audit	250,000		30,000	40,000	320,000
Objective 3. Complete Essential Water-Quality Monitoring					
Task 4. Water-Quality Monitoring to Assess BMPs					
Product 4. Water-Quality Monitoring	30,000				30,000
Total	**315,000**	**408,000**	**30,000**	**40,000**	**793,000**

Table 7-3b. Task 3 Explanation of 319 Fund Distribution

Supplemental Breakdown of 319 Project Management Budget	Hours/ Mileage	Rate	Cost
Financial Audit (Contracted)	NA	Actual Cost	22,000
Information and Education Events (BFRWP)	NA	Actual Cost	8,000
Administrative Assistant (Butte CD)		55% Gross Salary 2 years	40,000
Project Travel Mileage (Consultant)	23,000	0.56/mile	12,880
Travel Expense (Consultant)	NA	Actual Cost	3,000
BMP Project Planning and Certification (Consultant)	1,477	$80/Hour	118,160
Grant Tracking, Documentation, Proposal Writing (Consultant)	787	$80/Hour	62,960
Meetings, Technology Transfer, Information and Education Events (Consultant)	393	$80/Hour	31,440
Archeologist Contracted for SHPO Requirements (Consultant)	NA	Actual Cost 1 survey estimated	1,650
Miscellaneous(Engineer Design, GIS, Geologist, Proposal Writing)	181	$110/Hour	19,910
Total			**320,000**

Table 7-4. Budget of 319 and Matching Funds Budget

EPA 319 and Matching Funds Budget	EPA 319 ($)	Matching Funds ($)					Sum of Matching Funds ($)
		CWSRF Water Quality (Cash) ($)	Producer (Cash and In-kind) ($)	Lawrence County (Cash) ($)	BFID (Cash and In-kind) ($)	WY DEQ (Cash)	
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and *E. coli*							
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet							
Product 1. Improved Irrigation Water Delivery and Application							
1a. Convert 12 flood-irrigation systems to sprinkler-irrigation systems	333,000		800,000				800,000
1b. Irrigation Scheduling	35,000						
Task 2. Range and Riparian Area BMP Implementation							
Product 2. Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres	75,000		38,000				38,000
Objective 2. Conduct Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Project Design, Report Writing, Writing Future Grants, Annual Audit							
Task 3. Project Management and Administration							
Product 3. Public Outreach, and Education Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, Writing Future Grants, Annual Audit	320,000						
Objective 3. Complete Essential Water-Quality Monitoring							
Task 4. Water-Quality Monitoring to Assess BMPs							
Product 4. Water-Quality Monitoring	30,000			14,000	10,500	14,000	38,500
Total	**793,000**		**838,000**	**14,000**	**10,500**	**14,000**	**876,500**

Table 7-5. Total Budget

Total Budget	EPA 319 ($)	Matching Funds ($)	Nonmatching Funds ($)	Line Item Total ($)
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and *E. coli*				
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet				
Product 1. Improved Irrigation Water Delivery and Application				
1a. Convert 12 flood-irrigation systems to sprinkler-irrigation systems	333,000	800,000	150,000	1,283,000
1b. Irrigation Scheduling (395 hrs @ $80/hr; 6,000 miles @ $0.56/mile)	35,000			35,000
Task 2. Range and Riparian Area BMP Implementation				
Product 2. Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres	75,000	38,000	433,000	546,000
Objective 2. Conduct Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Project Design, Report Writing, Writing Future Grants, Annual Audit				
Task 3. Project Management and Administration				
Product 3. Public Outreach, and Education Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, Writing Future Grants, Annual Audit	320,000			320,000
Objective 3. Complete Essential Water-Quality Monitoring				
Task 4. Water-Quality Monitoring to Assess BMPs				
Product 4. Water-Quality Monitoring	30,000	38,500	264,400	332,900
Total	**793,000**	**876,500**	**847,400**	**2,516,900**

Table 7-6. Nonmatching Funds Budget

EPA 319 and Nonmatching Funds Budget	Nonmatching Funds						Sum of Nonmatching Funds ($)
	SD DENR (Federal) ($)	NRCS EQIP (Federal) ($)	COE (Federal) ($)	BOR (Federal) ($)	USGS (Federal) ($)	Other Grants (Conservation Commission, and others)	
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and *E. coli*							
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems by 1,085 Acre-Feet							
Product 1. Improved Irrigation Water Delivery and Application							
1a. Convert 12 flood-irrigation systems to sprinkler-irrigation systems		150,000					150,000
1b. Irrigation Scheduling (395 hrs @ $80/hr; 6,000 miles @ $0.56/mile)							
Task 2. Range and Riparian Area BMP Implementation							
Product 2. Implement Riparian Improvement on 1,500 Acres and Rangeland Improvement on 25,000 Acres		167,000				266,000	433,000
Objective 2. Conduct Public Outreach and Education, Implementation Record Keeping, Cultural Resources, Project Design, Report Writing, Writing Future Grants, Annual Audit							
Task 3. Project Management and Administration							
Product 3. Public Outreach, and Education Implementation Record Keeping, Cultural Resources, Engineering, Audits, Report Writing, Writing Future Grants, Annual Audit							
Objective 3. Complete Essential Water-Quality Monitoring							
Task 4. Water-Quality Monitoring to Assess BMPs							
Product 4. Water-Quality Monitoring	70,000		14,000	7,000	173,400		264,400
Total	**70,000**	**317,000**	**14,000**	**7,000**	**173,400**	**266,000**	**847,400**

8.0 PUBLIC INVOLVEMENT

Communicating with the major stakeholders in this project is critical to its success. Public involvement in the project will continue through public meetings with stakeholders, tours sponsored by BFRWP, newsletters sent out by conservation districts, radio advertisements, word of mouth, and the website developed by the partnership (*www.bellefourchewatershed.com*).

9.0 THREATENED AND ENDANGERED SPECIES

The following endangered species are identified by the SD GF&P as located within and/or migrating through the Lawrence, Butte, and Meade Counties: bald eagle, whooping crane, least tern, and the black-footed ferret. The implementation of this project is not expected to impact any of these species. An Endangered Species Act Compliance Assessment letter dated May 18, 2004, from Mr. Doug Lofstedt (South Dakota Section 319 Project Officer), documents the "no affect" determination for the endangered species in the project area.

The procedure to ensure that threatened and endangered species are not adversely affected by project activities is based on the following three main premises, which are the same as those used for Segments 1–4:

- The managed grazing systems, both planned and implemented, will promote the restoration or preservation of critical grassland habitat.
- It is anticipated that many of the grazing systems that are planned and implemented will be within areas that have compliance plans in place.
- The involvement of the NRCS and the USFWS in planning and construction grazing systems ensures personnel trained for mitigating threatened and endangered species will be involved with the design and implementation of project BMPs.

The species that are most likely to be encountered during the project, and the procedure to follow that relates one are included below.

9.1 Bald Eagle

The bald eagle is a threatened species with a known certainty of occurrence in all three counties. According to the USFWS, bald eagles are known to nest in the flood plain forest along the Missouri River in Yankton, Bon Homme, Union, and Gregory Counties; along the James River in Brown, Spink, Sanborn, and Hutchinson Counties; and in forested areas in Meade, Charles Mix, and Brown Counties of South Dakota.

The 319-funded activities will be very low intensity and widely dispersed over the landscape. The activities will not significantly increase or expand the level of human activity. Activities that disturb possible nesting sites or reduce food sources are not anticipated. Therefore, EPA-funded activities are expected to have no effect on the bald eagle and no consultation with the USFWS is planned.

9.2 Whooping Crane

The whooping crane is an endangered species with a known certainty of occurrence in all three counties. They are often found in South Dakota during spring and fall migrations. Migration through the state occurs from mid- to late-April and mid- to late-October. Although a variety of habitats are used during migration, a wetland is always used for night roosting and frequently for foraging. While migrating, whooping cranes roost in wide, shallow, open water areas, including marshes, flooded crop

fields, artificial ponds, reservoirs, and rivers. Roosting sites must also be isolated from human disturbances.

The EPA-funded monitoring activities will be of low intensity, widely dispersed over the landscape, and will not significantly increase or expand the level of human activity. In addition, if any cranes are observed at any project work site, "all mechanical activities at the site will be suspended until the bird(s) leave the site under their own volition" (Section 8.1). Thus the EPA-funded activities are expected to have no effect on the whooping crane and no consultation with the USFWS is planned.

9.3 Least Tern

The least tern is listed as an endangered species with a "known" certainty of occurrence in Meade County. This species historically breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems. The least tern is a local summer resident of the Missouri and Cheyenne Rivers in South Dakota. They can be found migrating through virtually all of South Dakota with the exception of the Black Hills. Least terns usually nest on open expanses of sand or small pebble beaches along shorelines, riverbanks, sandbars, and islands. Least terns typically select nesting sites that are well-drained and away from the water line (usually near a small ridge or piece of driftwood). Their food source consists almost entirely of small fish, and feeding requires shallow water areas with an abundance of fish near the nesting area.

Major losses and alterations of habitat occur from shoreline, bank, and channel modification from the construction of locks, dams, dikes, levees, and reservoirs. Flooding can prevent or destroy nesting and can be a byproduct of habitat alteration. Habitat losses can also result from increased development, recreational uses, natural erosion, human and domestic pet disturbances or harassment, and trampling by cattle. Pollution that affects fish populations can also impact least terns.

The 319-funded monitoring activities will be of low intensity, widely dispersed over the landscape, confined to a few isolated stream channel areas, and will not significantly increase or expand the level of human activity. Activities that disturb possible nesting sites or reduce food sources are not anticipated. If any least terns are observed near any project work site, "all mechanical activities at the site will be suspended until the bird(s) leave the site under their own volition" (PIP Section 8.2). Therefore, EPA-funded activities are expected to have no effect on the least tern and no consultation with the USFWS is planned.

9.4 Black-Footed Ferret

The black-footed ferret is an endangered species with a "possible" certainty of occurrence in all three counties. This species is a member of the weasel family. It feeds primarily on prairie dogs and uses their burrows for denning and shelter. Their historic range included Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming, Alberta, and Saskatchewan. The South Dakota population that disappeared in the wild in 1974 was thought to be the last remaining population. However, a captive propagation program was started from a Meeteetse, Wyoming, population that was discovered in 1981. Reintroductions have since occurred in Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. The South Dakota sites include the Conata Basin, Badlands National Park, and Cheyenne River Sioux tribal land in Dewey and Ziebach Counties.

Primary threats to the black-footed ferret include predation, disease, and loss of habitat. The ferrets can be affected by predators such as coyotes, golden eagles, great-horned owls, prairie falcons, badgers, bobcats, and foxes. Canine distemper will kill ferrets and sylvatic plague can eliminate

entire prairie dog towns. In South Dakota, sylvatic plague currently poses the biggest threat to ferret populations. However, poisoning prairie dogs and converting native prairie to cropland are main threats to ferret habitats.

The existence of black-footed ferrets is directly linked to the presence of prairie dogs. The sponsor will address the black-footed ferrets by complying with the South Dakota Prairie Dog Management Plan. If any actions are planned that may adversely affect the survival of a native or introduced population of black-footed ferrets, the sponsor will consult with the U.S. Fish and Wildlife Service.