PROJECT SUMMARY SHEET

AWARD FISCAL YEAR: 2016

PROJECT TITLE: **South Central Watershed Implementation Project Segment 1**

NAME: James River Water Development District ADDRESS: 251 4th St SW

CITY: Huron, SD ZIP CODE: 57350

PHONE: (605) 352-0600 FAX: EMAIL: rocky.knippling@sd.nacdnet.net

PROJECT LOCATION: LATITUDE: 43.2083 LONGITUDE:-98.2500

WATERSHED NAME: Lewis and Clark Lake PROJECT TYPES (See List): Watershed

HYRDOLOGIC UNIT CODE (HUC): 10170101, 10150001, 10150006, 10140101, 10160010

HIGH PRIORITY WATERSHED? Yes POLLUTANT TYPE: Agriculture

UWA CATEGORY: N/A

TMDL DEVELOPMENT (Y/N) N TMDL IMPLEMENTATION: (Y/N) Y

TMDL PRIORITY (High, Medium, Low): High WATERBODY TYPES: Lakes, rivers, streams

ECOREGION: Northern Glaciated Plains, Northwestern Glaciated Plains

PROJECT CATEGORY: Implementation

PROJECT FUNCTIONAL CATEGORY: Local (Specific Target) Education/ Information Programs

GROUNDWATER PROJECT? No

319 (FY16) Funds:	**$1,550,000**	**Other Federal Funds:**	**$5,066,924**
Future Requests (FY19)	**$960,500**	**Local Match:**	**$2,652,806**
Other Nonfederal Match:	**$3,087,300**	**Total Project Cost:**	**$13,317,530**
319 Funded Full Time Personnel:	**2.0**		

GOALS: The goal of the South Central Watershed Implementation Project is to restore or protect the beneficial uses in the Lower James River Watershed, Lewis and Clark Lake, and the watersheds of Geddes, Academy, Platte Lake and Lake Andes Lake. This will be accomplished through the installation of Best Management Practices (BMPs) in the watersheds that target sources of sediment, nutrients, and fecal coliform bacteria. This project, Segment I, will address and target BMP installation in the entire South Dakota portion of the Lewis and Clark Lake Watershed (1.9 million acres), the Lower James River Watershed and its tributaries (2.6 million acres). It will also provide technical and financial assistance to the watershed activities in the Lake Andes, Geddes, Academy and Platte Lake Watersheds. These additional four watersheds add up to 560,000 additional acres and are tributaries of the Missouri River and Lake Francis Case which lies upriver and borders the Lewis and Clark Lake Watershed. The total project area acreage is 5,053,800 acres.

PROJECT DESCRIPTION: This proposal is the first segment of a locally planned multi-year (10-15 year) effort to implement best management practices (BMPs) in the Lewis and Clark Lake watershed, Lake Andes, Geddes, Academy and Platte Lake Watersheds, and the impaired stretches of the Lower James River tributaries. This effort is aimed at restoring water quality to meet designated beneficial uses and address TMDLs established, and to be established, for water bodies in these watersheds.

2.0 STATEMENT OF NEED

2.1 The South Central Watershed Implementation Project is a five year project that is a combination of the Lewis and Clark Watershed and the Lower James River Watershed Implementation Project. Through the installation of BMPs in the watersheds, this project will restore or protect the water quality of the targeted watersheds.

Similar to the previous projects, this Project will continue providing assistance for BMP installation in the priority project areas and complete an information campaign to keep stakeholders informed of project activities and progress.

The South Central Watershed Implementation Project includes the 303d listed water bodies – Dante Lake, Roosevelt Lake, Lake Mitchell and Lake Andes.

This project will use available data from the watershed assessments and stakeholder input to prioritize BMP installation. Animal Feeding Area Assessments has been used to prioritize Animal Feeding Areas for the project area.

The beneficial uses for waterbodies in this project's watershed are shown in Table 1 on the next page. Attainment of the beneficial uses in the watersheds allows continued use of the water bodies for drinking water, livestock water, swimming, boating, recreation, irrigation, commerce, wildlife, and residential living. This project will continue to build on the successes reached by the previous projects for successful restoration of the Lewis and Clark Lake Watershed and Lower James Watershed to its intended beneficial uses.

This project will also benefit Lewis and Clark Lake, which is threatened by sediment to the level that its life span is estimated by the Corps of Engineers to be 75 to 135 years. Lewis and Clark Lake is the source of drinking water for many Nebraska and South Dakota communities, and is part of the Missouri main stem dam system that provides flood control and hydroelectric power. Located near Yankton, the lake is a major residential area (20-25,000 population), has over 1,000,000 visitors to its recreation areas, and has an annual recreational economic impact in excess of $12 million.

Table 1: Beneficial Uses for Targeted Water Bodies.

Water Body	Basin	Beneficial Uses
Beaver Lake - L2	Lower James River Basin	6,7,8,9
Dawson Creek	Lower James River Basin	6,8,9,10
Firesteel Creek	Lower James River Basin	1,5,8,9,10
James River	Lower James River Basin	5,8,9,10
Lake Hanson -L16	Lower James River Basin	6,7,8,9
Lake Mitchell -L22	Lower James River Basin	1,4,7,8,10
Menno Lake -L20	Lower James River Basin	5,7,8,9
Mud Creek (Yankton County)	Lower James River Basin	6,8,9,10
Pierre Creek	Lower James River Basin	5,8,9,10
Twin Lakes -L35	Lower James River Basin	5,7,8,9
Wilmarth Lake -L37	Lower James River Basin	4,7,8,9
Wolf Creek	Lower James River Basin	6,8,9,10
Academy Lake	Lower Missouri River Basin	1,4,7,8,9,10,11
Andes Creek	Lower Missouri River Basin	5,7,8,9
Burke Lake	Lower Missouri River Basin	4,7,8,9
Choteau Creek	Lower Missouri River Basin	5,8,9,10
Corsica Lake	Lower Missouri River Basin	6,7,8,9
Dante Lake	Lower Missouri River Basin	9,10
Emmanuel Creek	Lower Missouri River Basin	5,8,9,10
Fairfax Lake	Lower Missouri River Basin	4,7,8,9
Geddes Lake	Lower Missouri River Basin	5,7,8,9
Lake Andes	Lower Missouri River Basin	5,7,8,9
Lewis and Clark Lake	Lower Missouri River Basin	5,8,9,10
Platte Creek	Lower Missouri River Basin	1,5,8,9,10
Platte Lake	Lower Missouri River Basin	4,7,8,9
Ponca Creek	Lower Missouri River Basin	4,7,8,9
Roosevelt Dam	Lower Missouri River Basin	9,10
Sand Creek	Lower Missouri River Basin	5,8,9,10
Slaughter Creek	Lower Missouri River Basin	9,10
Antelope Creek	Niobrara River Basin	6,9,10
Keya Paha River	Niobrara River Basin	6,7,8,9
Rahn Lake	Niobrara River Basin	5,9

Numerical Key to Beneficial Uses listed in Table 2:

(1) Domestic water supply waters;
(4) Warm water permanent fish life propagation waters;
(5) Warm water semi-permanent fish life propagation waters;
(6) Warm water marginal fish life propagation waters;
(7) Immersion recreation waters;
(8) Limited contact recreation waters;
(9) Fish and wildlife propagation, recreation, and stock watering waters;
(10) Irrigation waters; and
(11) Commerce and industry waters

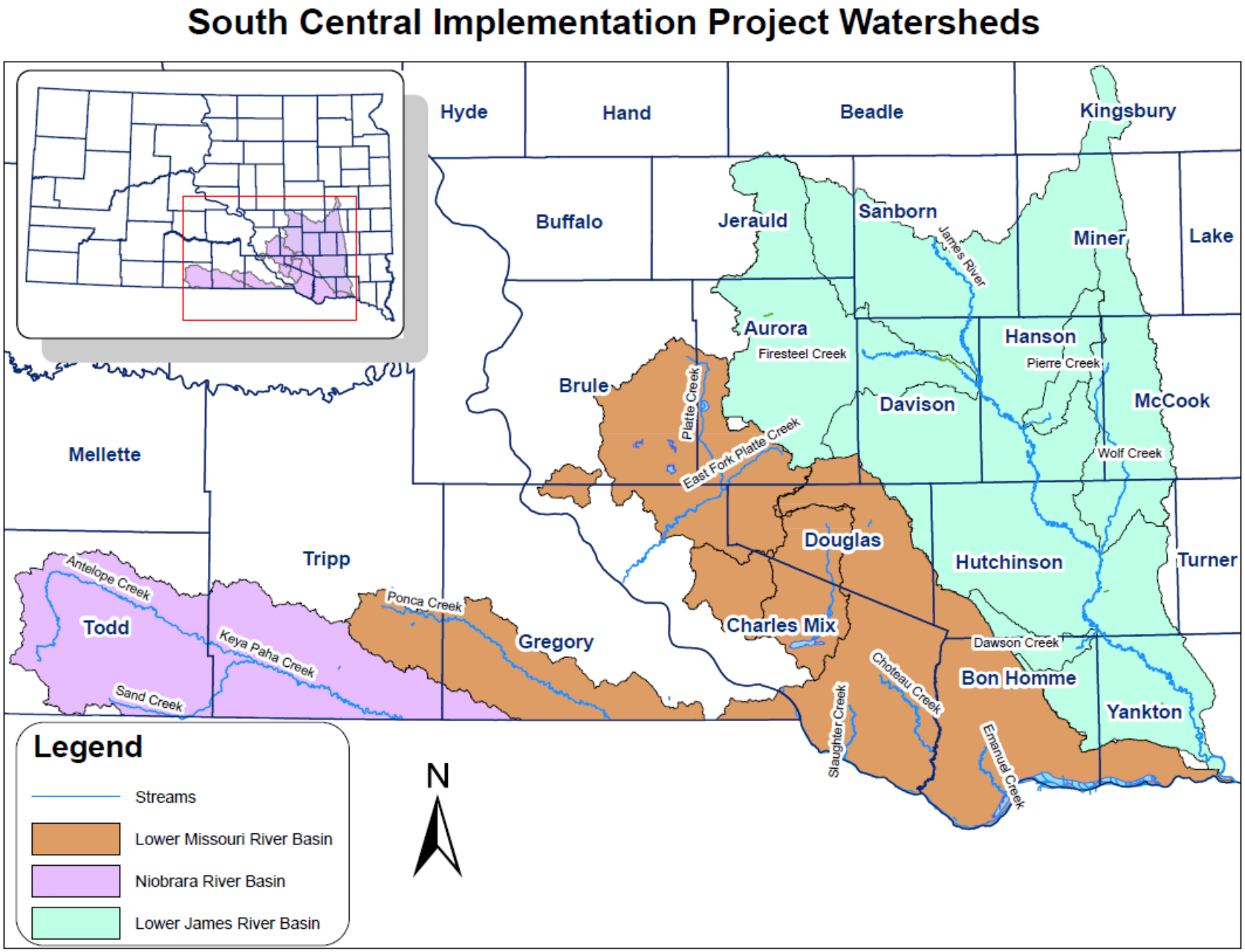

Figure 1: South Central Watersheds.

2.4 General Watershed Characteristics

The South Central Watershed Project area includes three Ecoregions:

1. Northern Glaciated Plains: Most of the Lower James River watershed and easternmost portion of the Lewis and Clark watershed.
2. Northwestern Great Plains: Western portion of the watershed associated with the Keya Paha River watershed in South Dakota.
3. Northwestern Glaciated Plains: East River portion of the Lewis and Clark watershed, and most of Gregory County and parts of Tripp County bordering the west side of the Missouri River to include most of the Ponca Creek watershed.

The watershed east of the Missouri river is primarily row crop agriculture. There is some pasture and hay land in areas not suitable for row crop farming. There are also a large number of animal feeding areas in the watershed. Detailed information was gathered during the assessment project. There is a large mix of uplands, swales, and wetland depressions.

Land use transitions from livestock grazing (80% grassland land use) and small grains west of the Missouri River.

The average annual precipitation in the watershed is 18 inches in the west to 24 inches in the east, of which 77 percent usually falls during April through September. Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration, and occasionally produce heavy rainfall events. The average seasonal snowfall is 36 inches per year.

The Lower Missouri River Basin portion of the watershed has a drainage area of approximately 1,700,000 acres, the Niobrara River Basin has approximately 280,000 ac, and the Lower James River Basin is approximately 2,300,000 ac (seen in Figure 1). This project's area includes the South Dakota portion of the Watershed, HUC8# 10170101, 10150001, 10150006, 10160010 and most of 10140101.

2.5 Water Quality Impairments

Several Watershed Assessments were initiated at the request of local organizations and citizens concerned about water quality problems in the project area. Assessments for the watersheds in this project area were completed between 2005 and 2012. Impairments to lakes and streams are generally caused by agricultural nonpoint sources of pollution. Figure 2 on the next page shows the waterbodies that are impaired or threated according to the "2014 South Dakota Integrated Report for Surface Water Quality Assessment"

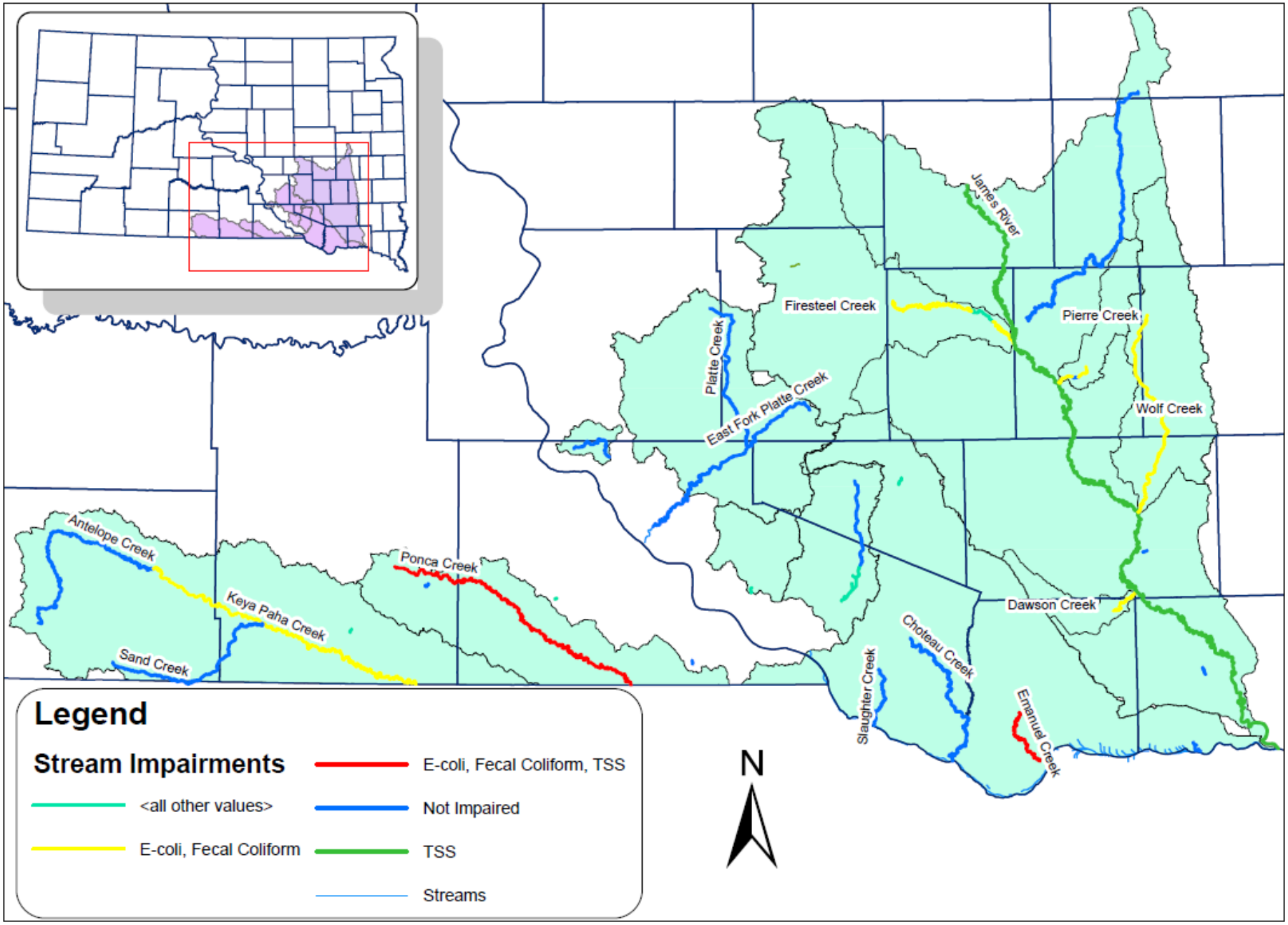

Figure 2: South Central Watershed Impaired or Threatened Waterbodies.

Table 2 below identifies water bodies in the Project Area listed in the "2014 South Dakota Integrated Report for Surface Water Quality Assessment" as not meeting their designated beneficial use(s).

Table 2: South Central Watersheds Implementation Project Water bodies and their designated beneficial uses listed as not being met or threatened.

Designated Beneficial Uses Not Being Met or threatened							
Water body	Immersion Recreation	Limited Contact Recreation	Warm Water Marginal Fish Life	Warm Water Permanent Fish Life	Warm Water Semi-Permanent Fish Life	Fish/Wildlife Prop, Rec, Stock	Irrigation Waters
Beaver Lake					X		
Burke Lake					X		
Dante Lake				X			
Dawson Creek		X					
Emmanuel Creek		X			X		
Geddes Lake					X		
James River					X		
Keya Paha River		X			X		
Lake Andes	X	X	X				
Lake Carthage				X			
Pierre Creek		X					
Ponca Creek		X					
Rahn Lake				X			
Roosevelt Lake						X	
Slaughter Creek						X	X
Wolf Creek			X				

Summary of Study Findings for the South Central Watershed.

Fecal Bacteria/ *E. coli*

The data indicated that animal feeding operations contribute fecal contamination to the tributaries of the impaired reaches of this watershed. In many cases, the concentrations of fecal coliform bacteria and *E. coli* were too high for human recreation. TMDLs for fecal coliform bacteria have been developed for Keya Paha, Ponca, Choteau, Emmanuel, Dawson, Pierre, Wolf, and James River. High fecal coliform counts were also detected in the Snatch Creek drainage; however, no standards for bacteria exist for this water body. Data from the feedlot survey completed during the watershed assessments are available and have been used to prioritize feedlots in the project area.

Table 3: Fecal/*E. coli* Source Allocation for Keya Paha River

Source	Percentage
Feedlots	33.1%
Livestock on Grass	64.3%
Wildlife	1.2%

Table 4: TMDL Summary for Fecal Coliforms in Keya Paha River from October 2009 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)				
	High	Moist	Mid	Dry	Low
	>163 cfs	54-163 cfs	35-24 cfs	35-16 cfs	<16 cfs
LA	1.34E+13	3.11E+12	7.82E+11	5.62E+11	1.22E+11
WLA	0	0	0	0	0
MOS	2.25E+12	1.71E+11	4.65E+11	2.45E+11	2.45E+11
TMDL @ 1000 colonies/100 mL	1.56E+13	3.28E+12	1.25E+12	8.07E+11	3.67E+11
Current Load*	2.65E+13	5.57E+12	2.23E+12	5.09E+11	2.63E+11
Load Reduction	41%	41%	44%	0%	0%
**Current Load is the 90th percentile concentration * 90th percentile flow in each regime*					

Table 5: TMDL Summary for *E. coli* in Keya Paha River from June 2011 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)				
	High	Moist	Mid	Dry	Low
	>170 cfs	55-170 cfs	36-55 cfs	16-36 cfs	<16 cfs
LA	1.3E+16	3.7E+14	4.5E+13	1.9E+13	3.8E+12
WLA	0	0	0	0	0
MOS	1.4E+12	4.5E+11	1.2E+11	1.7E+11	1.5E+11
TMDL @ 1000 colonies/100 mL	1.3E+16	3.7E+14	4.5E+13	1.9E+13	3.9E+12
Current Load*	3.6E+16	8.5E+14	7.3E+13	1.1E+13	3.5E+12
Load Reduction	64%	57%	38%	0%	0%
**Current Load is the 95th percentile concentration * 95th percentile flow in each regime*					

Table 6: Fecal Source Allocation for Ponca Creek

Source	Percentage
Feedlots	9.1%
Livestock on Grass	90.5%
Wildlife	0.4%

Table 7: TMDL Summary for Fecal Coliforms in Ponca Creek from April 2010 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)				
	High	Moist	Mid	Dry	Low
	>96 cfs	19-96 cfs	8-19 cfs	1-8 cfs	<1 cfs
LA	1.78E+13	1.13E+12	9.69E+10	7.50E+09	4.26E+09
WLA Colome	3.30E+10	3.30E+10	3.30E+10	3.30E+10	4.16E+09
WLA Gregory	4.51E+11	4.51E+11	2.15E+11	7.35E+10	4.16E+09
MOS	1.99E+12	4.01E+11	4.63E+11	6.60E+10	9.43E+09
TMDL @ 1000 colonies/100 mL	2.03E+13	2.02E+12	4.63E+11	1.80E+11	3.67E+11
Current Load*	2.38E+13	7.89E+11	5.18E+11	1.09E+11	4.16E+11
Load Reduction	19%	0%	11%	0%	95%
**Current Load is the 90th percentile concentration * 90th percentile flow in each regime*					

Table 8: Fecal Source Allocation for Emanuel Creek

Source	Percentage
Feedlots	41.7%
Livestock on Grass	54.9%
Wildlife	3.5%

Table 9: TMDL Summary for Fecal Coliforms in Emanuel Creek from April 2009 Assessment

TMDL Component	Flow Zone (expressed as CFU*10_{10}/day)		
	High	Middle	Low
	>15 cfs	3-15 cfs	<3 cfs
LA	503.4	25.2	1.99
WLA	0	0	0
MOS	85.6	3.4	5.1
TMDL @ 1000 CFU/ 100 mL	589	28.6	7.09
Current Load*	58,900	37.2	3.47
Load Reduction	99%	23%	0%
**Current Load is the highest concentration * 90th percentile flow in each regime*			

Table 10: TMDL Summary for Fecal Coliforms in Emanuel Creek from May 2011 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)		
	High	Mid	Low
	>15 cfs	3-15 cfs	<3 cfs
LA	3.2E+12	1.6E+11	1.2E+10
WLA	0	0	0
MOS	5.4E+11	2.2E+10	3.2E+10
TMDL @ 1000 colonies/100 mL	3.7E+12	1.8E+11	4.5E+10
Current Load*	3.1E+14	3.7E+11	3.6E+10
Load Reduction	99%	52%	0%
**Current Load is the highest concentration * 90th percentile flow in each regime*			

Table 11: Fecal Source Allocation for James River 11

Source	Percentage
Feedlots	43.10%
Livestock on Grass	54.70%
Wildlife	2.00%

Table 12: TMDL Summary for Fecal Coliforms in James River from January 2011 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)				
	High	Moist	Mid	Dry	Low
	>2,790 cfs	450-2,790 cfs	167-450 cfs	20-167 cfs	0.5-20 cfs
LA	3.78E+14	4.65E+13	7.92E+12	2.49E+12	1.83E+11
WLA Utica	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MOS	4.55E+13	1.47E+13	2.52E+12	1.30E+12	2.82E+11
TMDL @ 1000 colonies/100 mL	4.23E+14	6.11E+13	1.04E+13	3.79E+12	4.65E+11
Current Load*	5.80E+14	1.89E+14	4.91E+12	5.29E+12	5.02E+11
Load Reduction	27%	68%	0%	28%	7%
**Current Load is the 90th percentile concentration * 90th percentile flow in each regime*					

Table 13: TMDL Summary for *E-coli* in James River from September 2011 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)		
	High	Mid	Low
	12-275 cfs	2.8-12 cfs	1.5-2.8 cfs
LA	1.01E+12	1.40E+11	3.25E+10
WLA	0	0	0
MOS	4.97E+10	3.87E+10	1.10E+10
TMDL @ 1000 colonies/100 mL	1.06E+12	1.79E+11	4.35E+10
Current Load*	4.06E+12	3.16E+11	1.19E+11
Load Reduction	74%	43%	63%
**Current Load is the highest concentration * 90th percentile flow in each regime*			

Table 14: Fecal Source Allocation for Dawson Creek

Source	Percentage
Feedlots	62.20%
Livestock on Grass	37.40%
Wildlife	0.40%

Table 15: TMDL Summary for Fecal Coliform in Dawson Creek from January 2011 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)		
	High	Mid	Low
	>11.1 cfs	11.1-1.1 cfs	<1.1 cfs
LA	6.67E+12	1.02E+10	7.41E+09
WLA	1.65E+11	1.65E+11	7.40E+09
MOS	4.52E+11	5.43E+10	9.86E+09
TMDL @ 1000 colonies/100 mL	7.28E+12	2.29E+11	2.47E+10
Current Load*	7.14E+13	2.41E+13	2.39E+11
Load Reduction	90%	99%	90%
**Current Load is the highest concentration * 90th percentile flow in each regime*			

Table 16: TMDL Summary for *E-coli* in Dawson Creek from April 2012 Assessment

TMDL Component	Flow Zone (expressed as Colonies/Day)				
	High	Moist	Mid	Dry	Low
	>99.8 cfs	99.8-7.4 cfs	7.4-2.7 cfs	2.7-1 cfs	<1 cfs
LA	2.02E+13	9.27E+11	3.94E+10	1.55E+10	5.12E+09
WLA Bridgewater	4.90E+10	4.90E+10	1.97E+10	7.74E+09	2.56E+09
WLA Emery	6.69E+10	6.69E+10	1.97E+10	7.74E+09	2.56E+09
MOS	2.46E+12	1.70E+11	2.73E+10	9.74E+09	4.08E+09
TMDL @ 1000 colonies/100 mL	2.28E+13	1.21E+12	1.06E+11	4.07E+10	1.43E+10
Current Load*	8.40E+13	5.01E+12	2.40E+11	3.15E+10	4.30E+09
Load Reduction	73%	76%	56%	0%	0%
**Current Load is the 90th percentile concentration * 90th percentile flow in each regime*					

Sediment

1. Sheet and Rill Erosion

   The modeling indicates that in the western portion of the watershed, cropland erosion is not a critical component to the sediment load, primarily because of its absence in the watershed. As a result, many of the tributaries to the Niobrara and Keya Paha Rivers were not found to generate significant loads according to the model. Some areas of the South Dakota portion of the watershed, particularly those located in Bon Homme County, may benefit from mitigation activities aimed at cropping practices - such as reduced tillage and buffer systems. To a greater extent, managed grazing practices, which will improve ecological range condition and reduced runoff, will benefit the reservoir.

2. Riparian Areas

   A number of concerns regarding riparian area conditions were identified. The data indicates that degraded riparian areas and channel erosion are a significant source of sediment entering the reservoir. The complexity of some of the degraded areas will require additional site specific analysis prior to any BMP design. Degraded channels appear to be the result of several different causes, and in some cases a combination of causes in various locations throughout the watershed. Causes of riparian and channel degradation are listed below:

   - Season long grazing, overstocking, and unmanaged grazing of stream banks may be one of the larger contributors to degraded channels.
   - Culvert sizing and placement has created some localized erosion problems downstream from their placement.
   - Degraded ecological range condition on some of the uplands has created increased runoff that has contributed to channel degradation.
   - To a lesser extent, cropping of some critical areas has resulted in degraded channels.

Choteau Creek TSS

Upland Erosion

To accommodate the large acreage in the Choteau Creek drainage, the watershed was broken into two segments for modeling with AnnAGNPs. The roughly 40,000 acre eastern portion of the basin from the confluence of Choteau and Dry Choteau Creeks was analyzed separately. The AnnAGNPs model suggested that a disproportionate percentage of the TSS load may originate from the Dry Choteau drainage, which generated an erosion rate of 2.3 tons/ acre annually. The 335,000 acres in the western portion of the basin generated an erosion rate of 0.44 tons/acre. These values are erosion rates and may not be used to calculate a delivered load of sediment at the outlet of the watershed. Not only were the erosion rates for Dry Choteau higher than the mainstem, but when compared with the greater Lewis and Clark basin, these loadings were among the highest modeled.

The Choteau Creek drainage contains approximately 258 animal feeding operations. The Dry Choteau drainage area contains only 25 of these operations, four of which are in close enough proximity to the stream to have a potential for contributing suspended solids. These four lots have implementation priority rankings of 25, 38, 86, and 130 (out of 502) in the Lewis and Clark Implementation Project. The relatively high rankings of the top two will result in further analysis and potential remediation during the implementation. However, it is unlikely this will significantly affect the TSS loadings, as their combined acreage is estimated to be less than 7 acres.

Bed and Bank Erosion

There were 262 individual Rapid Geomorphic Assessments (RGAs) completed in the Choteau Creek drainage. Figure 3 depicts the locations of each of the RGAs and also represents their relative stability scores. Each RGA was completed on both the upstream and downstream portions of a road crossing, resulting in what appears to be some sites receiving both a stable and unstable score. These are treated as two separate scores for each crossing, one upstream and the other downstream. This was done to determine potential impacts of culverts and bridges under the assumption that a stable score upstream and an unstable score downstream may be a localized effect of the road crossing.

Culverts on small streams such as Choteau Creek may at times create more instability immediately downstream of the structure than bridges do, when installed in similar situations. All of the road crossings along the Dry Choteau segment having the unstable RGA scores have bridges installed. The upstream sites at these road crossings also received unstable scores, indicating that it is unlikely that the road crossings along this portion of the stream are contributing to the channel instability.

Using a gross score of 20 as the dividing line between stable and unstable channels, it appears that the lower reaches of Choteau Creek are more unstable than the rest of the watershed. Based on a combination of the RGA scores and the best professional judgment of the local coordinators, approximately 50 miles of the 420 stream miles (12%) were identified as having intermittent segments of degraded channel stability (see the bolded stream segments in Figure 4). It is interesting to note that the portions of the stream that appear to be most unstable include nearly the entire segment of Choteau Creek that is impaired and is assigned the fisheries and recreation classifications.

These unstable portions of stream may have a variety of causes including increased runoff from adjacent upland areas, poorly designed road crossings, and agricultural pressures in and around the stream riparian area. It is suspected that all of these factors in addition to natural channel erosion processes may be contributing factors in various portions of the watershed.

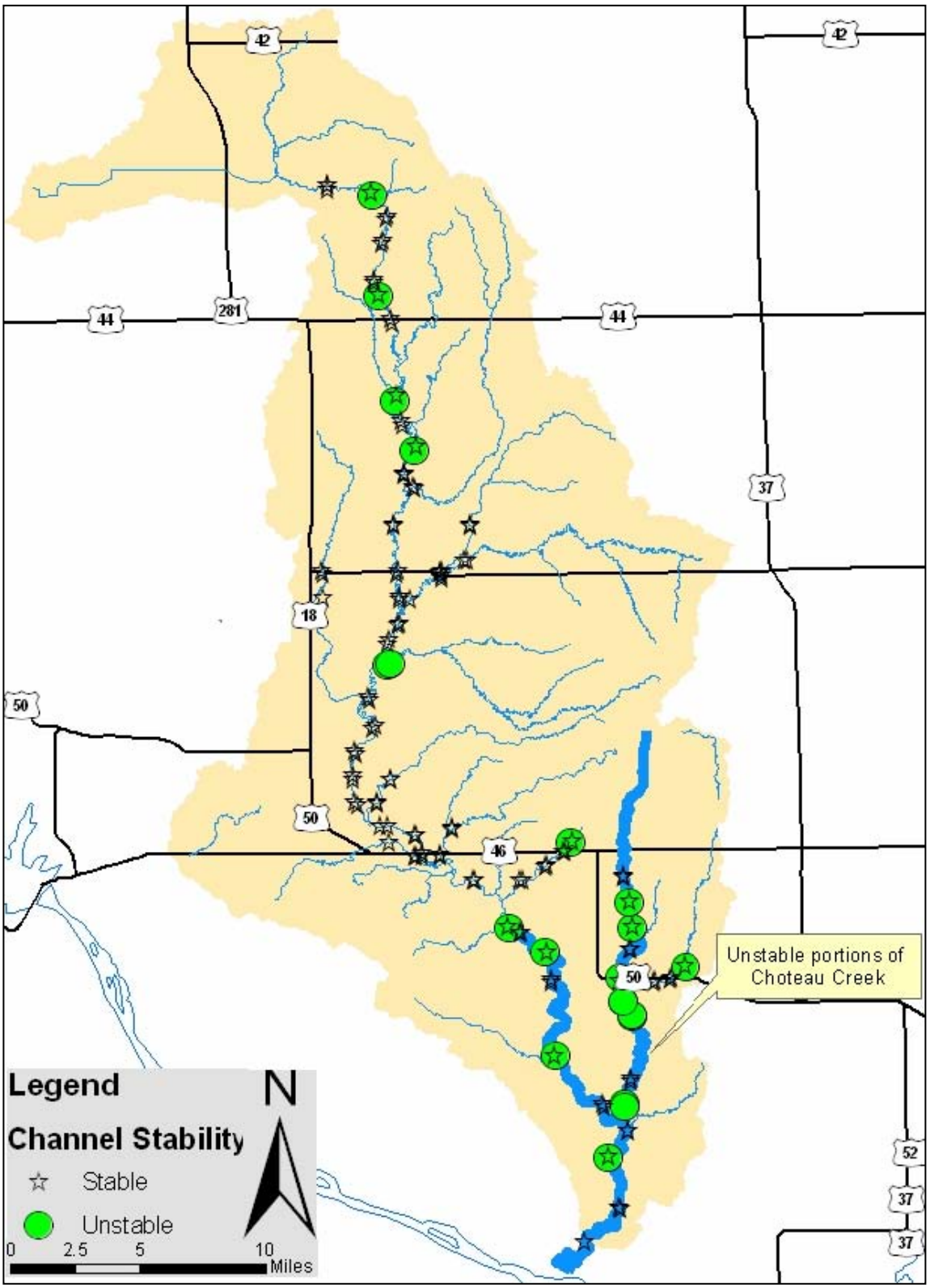

Figure 3. Choteau Creek RGA Locations.

RGA scores throughout the remainder of the basin indicated a range of conditions. Unstable sites found upstream of the highlighted section in Figure 3 appear to be localized in nature. Remediation success is more likely on localized area such as these, however many of them are located a significant distance upstream of the listed segment. Due to this distance, best management practices applied to these areas are unlikely to result in measurable improvements in the listed segment.

Table 17: Choteau Creek by Flow Regime from February 2010 Assessment

TMDL Component	Flow Zone (expressed as Tons/Day)			
	Zone 1	Zone 2	Zone 3	Zone 4
	>107 cfs	107-6.1 cfs	6.1-3 cfs	3-1 cfs
LA	352.08	21.48	0.73	0.33
WLA Avon*	0.81	0.81	0.43	0.21
WLA Wagner*	1.16	1.16	0.14	0.07
WLA Delmont*			-	
MOS	20.17	1.32	0.13	0.10
TMDL @ 90 mg/L	374.22	24.78	1.44	0.70
Current Load**	3,284.82	19.54	0.55	0.52
Load Reduction	89%	0%	0%	0%

WLA are calculated at the maximum flow in each flow zone that is less than the maximum discharge capacity of the system. Flow zones that exceed the design capacity of the system use the maximum discharge of the system to calculate the WLA

***Current Load is the 95th percentile concentration * 95th percentile flow in each regime with the exception of the Zone 1, in which the 90th percentile concentration was used.*

Water sampling completed during 2011 led to the Choteau Creek drainage being delisted for TSS, as confirmed by the 2012 Integrated Report. The steering committee recommendations are that work will still be done in this drainage in critical areas and in animal feeding operations to maintain this status of the drainage.

Emanuel TSS

A number of rapid geomorphic assessments (RGAs) were conducted on portions of Emanuel Creek located downstream of Highway 50 (Figure 4). Scores from the RGAs indicate an unstable channel. Since the AnnAGNPS model does not address channel stability or erosion, the high RGA scores help to explain the source of sediments in Emanuel Creek. The scoring technique used during this assessment places any channel with a score of 20 or greater into the unstable category. Using this as the basis to target stream miles, 50 % or approximately 30 km of the stream located downstream of Highway 50 are unstable and contributing to increased sediment loading

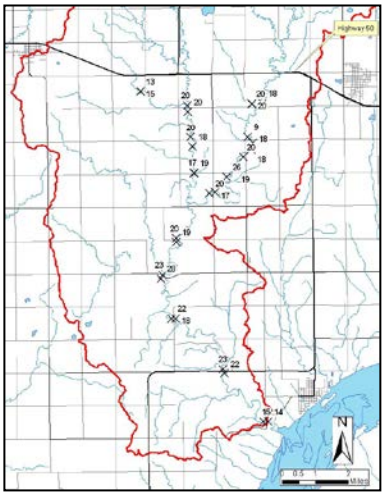

Figure 4. Emmanuel Creek RGA Locations with score.

Table 18: Emanuel Creek Total Maximum Daily Load by Flow Regime from May 2009 Assessment

TMDL Component	Flow Zone (expressed as Tons/day)		
	High	Middle	Low
	>15 cfs	3-15 cfs	<3 cfs
LA	580.49	28.26	6.58
WLA	0	0	0
MOS	8.51	0.34	0.51
TMDL @ 90 mg/L (chronic standard)	589	28.6	7.09
Current Load*	1,392	3.84	0.2
Load Reduction	58%	0%	0%
**Current Load is the highest concentration * 90th percentile flow in each regime*			

Ponca Creek TSS

Channel stability in Ponca Creek is a critical component contributing to the suspended solids loadings in the stream. To characterize channel stability in Ponca Creek, 56 Rapid Geomorphic Assessments (RGA's) were conducted. RGA's are a qualitative technique used to quickly identify and compare the evolutionary stage of channels. The values obtained are unitless and allow for a comparison between channels of different sizes. The assessment is not designed to generate a sediment or nutrient load from the channel, but may help identify portions of the stream that may benefit from additional analysis or BMPs.

The average RGA score for each stream segment was evaluated. For the purposes of this study, it was determined that a score less than 18.5 would be considered a stable channel while scores exceeding 18.5 would be considered unstable, and they were only completed within Gregory County for the Ponca Creek portion of the assessment.

The main stem of Ponca Creek consistently received scores indicating an unstable channel. Small tributaries to the main channel consistently received scores indicating that they were stable. During the assessment, some local concern was expressed regarding stream crossing structures (bridges and culverts) and their impact on channel stability. Reviewing the upstream and downstream scores suggests that there are localized areas of bank erosion that may be linked to the stream crossing structure.

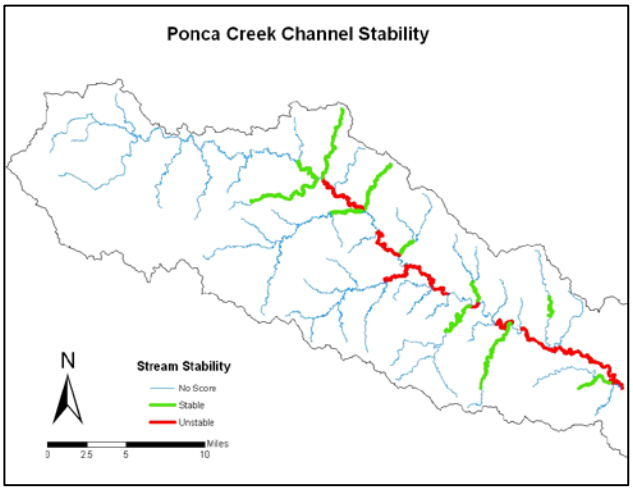

Figure 5: Ponca Creek Channel Stability.

Estimates of sediment production were relatively high for the Ponca Creek drainage (1.15 tons/acre). Seventeen of the 28 tributaries (nine of which are located in South Dakota) within this larger drainage produced sediment production estimates of greater than 1 ton/acre. This indicates that much of this watershed is more susceptible to sheet and rill erosion than neighboring drainages.

Five tributaries produced sediment yield estimates of greater than 2 tons/acre. One of these (PC7, 2.3 tons/acre) is located in South Dakota. PC7 originates ½ way between Burke and Gregory and drains south into Ponca Creek, see Figure 6.

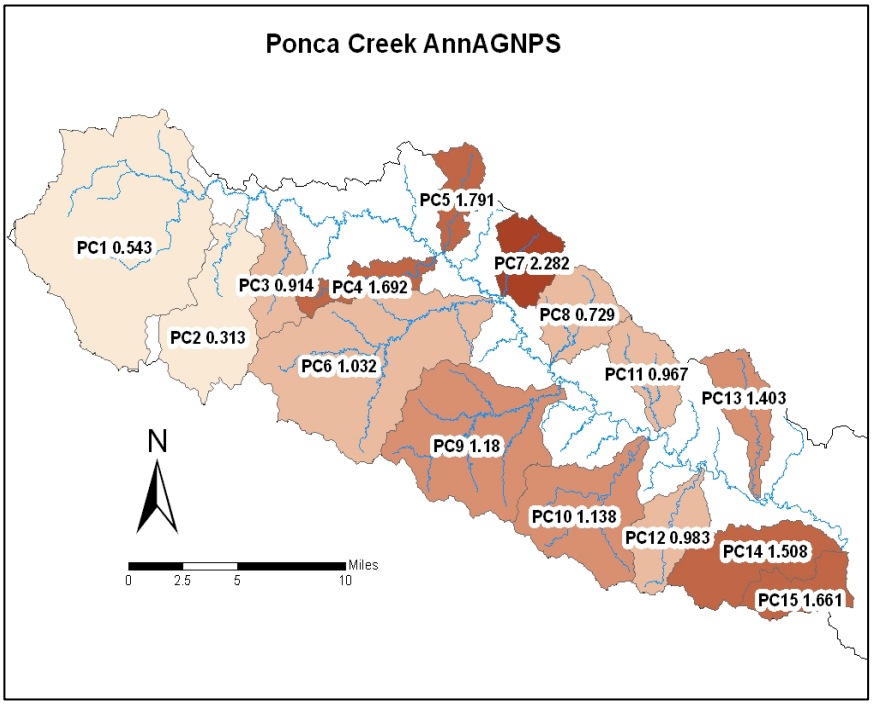

Figure 6: Sediment Production for Ponca Creek.

Table 19: Ponca Creek Total Maximum Daily Load by Flow Regime from February 2010 Assessment

TMDL Component	Flow Zone (expressed as Tons/Day)		
	Zone 1	Zone 2	Zone 3
	>86 cfs	86-10 cfs	10-1 cfs
LA	139.54	12.45	0.47
WLA Colome*	0.12	0.12	0.12
WLA Gregory*	1.04	1.04	1.04
MOS	20.14	3.89	0.66
TMDL @ 90 mg/L	161.84	17.50	2.28
Current Load**	1,096.90	33.05	1.80
Load Reduction	85%	47%	0%

WLA are calculated at the maximum flow in each flow zone that is less than the maximum discharge capacity of the system. Flow zones that exceed the design capacity of the system use the maximum discharge of the system to calculate the WLA

***Current Load is the 95th percentile concentration * 95th percentile flow in each regime with the exception of the Zone 1, in which the 90th percentile concentration was used.*

Keya Paha TSS

AnnAGNPs analysis of the subwatersheds in the Keya Paha basin indicates low rates of sediment production for a majority of the basin when compared to the greater Lewis and Clark drainage. Figure 7 depicts a relative ranking with the subwatersheds that the model suggested were producing higher erosion rates (as compared against other drainages within the Keya Paha drainage and not against the greater Lewis and Clark basin) represented by darker shading.

Table 20: TMDL Summary for Suspended Solids in Keya Paha River form May 2009 Assessment

TMDL Component	Flow Zone (expressed as Tons/Day)				
	High	Moist	Mid	Dry	Low
	>163 cfs	163-54 cfs	54-35 cfs	35-16 cfs	<16 cfs
LA	132.7	30.9	7.8	5.6	1.2
WLA					
MOS	22.4	1.7	4.6	2.4	2.4
TMDL @ 1000 colonies/100 mL	155.0	32.6	12.4	8.0	3.6
Current Load*	1,123.1	65.1	17.8	6.1	3.1
Load Reduction	86%	50%	30%	0%	0%
*Current Load is the 90th percentile concentration * 90th percentile flow in each regime*					

Table 21. Results of AnnAGNPs modeling expressed by grouping sub-tributaries according to geographic area or "parent" tributary

Trib./ General Area	# of subwatersheds	Drainage area (acres)	Sediment prod.(tons)	Tons/acre
Ponca Creek	28	324,287	372,542	1.15
East River area (SD)	21	592,444	589,553	1.01
Keya Paha River	32	629,121	180,005	0.28
Niobrara River	21	2,386,284	144,809	0.06
Santee area (NE)	2	311,287	1,208,402	3.88

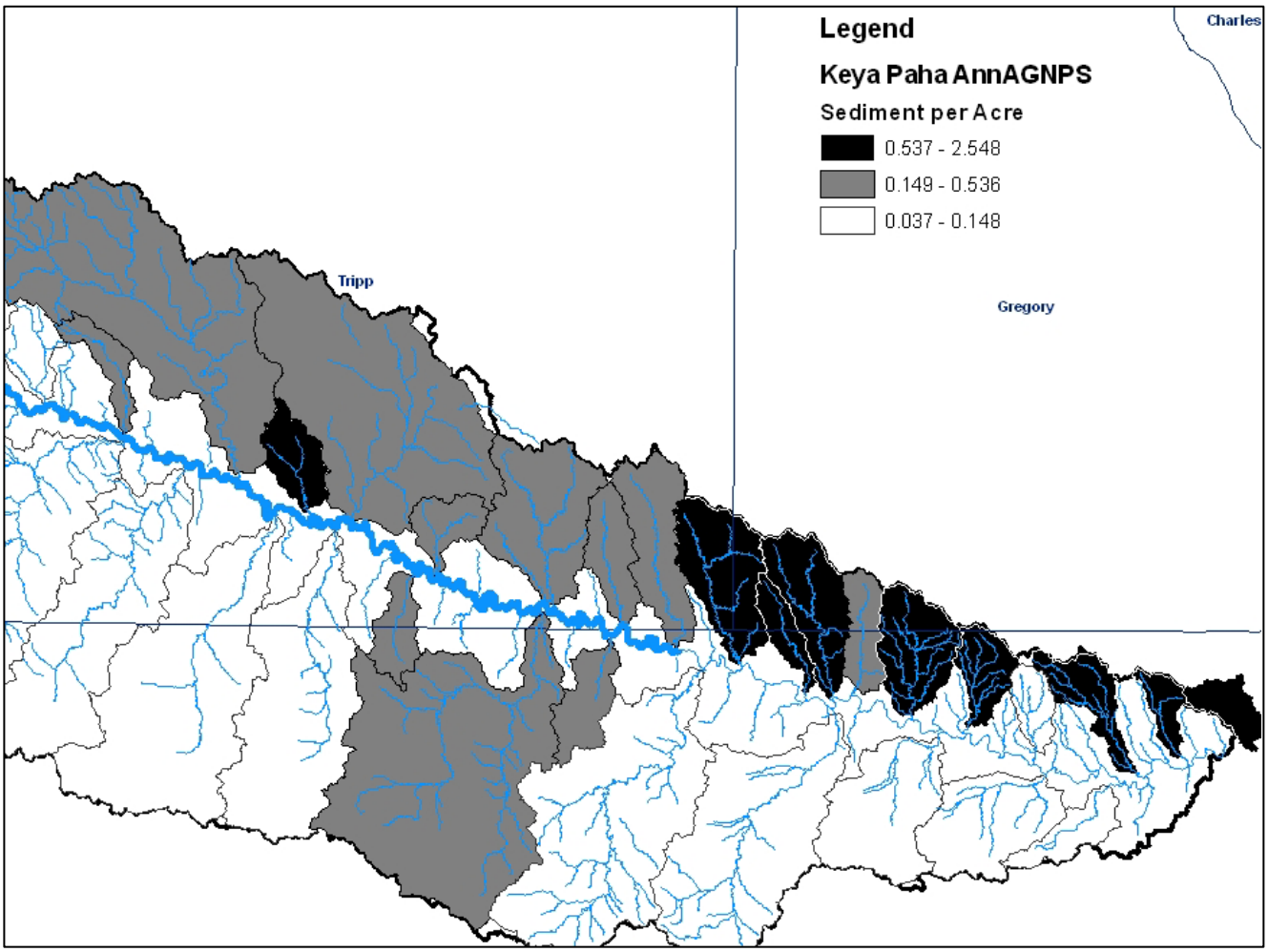

Figure 7: Keya Paha AnnAGNPs

Rapid Geomorphic Assessments (RGAs) were completed at 23 sites within the Keya Paha basin. Figure 8 depicts the areas where RGAs were completed with the AnnAGNPs results shaded. The results were broken into stable and unstable stream channels with approximately 12% of the sites ranking as unstable. The three unstable sites were located on tributaries.

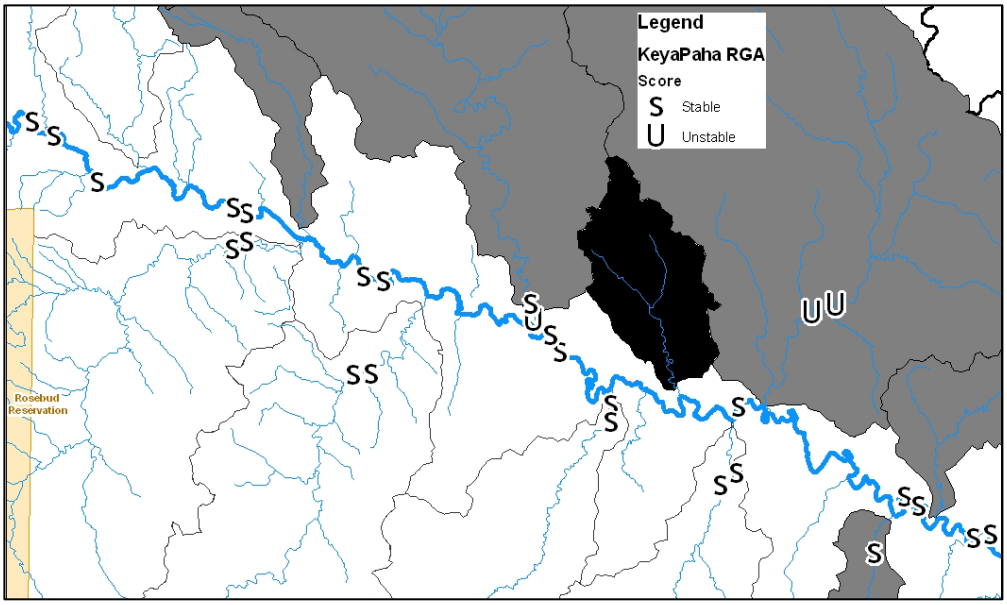

Figure 8: Keya Paha RGA Locations

The primary elements considered when allocating sources within the Keya Paha watershed were predicted sheet and rill erosion loads, potential for bank failure based on RGA assessment, and the natural soil conditions of both the listed segment as well as upstream contributions.

Sheet and rill erosion from the Keya Paha watershed was predicted by the AnnAGNPs model to be less than many of the other watersheds in the Lewis and Clark basin. There may be several factors contributing to this, but the primary reason suspected is the high percentage of native range, in particular in locations that may be more erosion prone.

The RGA analysis indicated a relatively stable channel. Aggravated banks on the outsides of the meanders were common, as were old meander scars on the floodplain indicating that the river has moved frequently over time. The primary soils through the stream corridor consist of the Invale Cass associations. These soils are characterized by loamy fine sands overlying fine to medium sands. These types of soils are typically noncohesive and are more prone to failures, which is evident in the frequency of meander scars. Particle size data collected by the USGS is insufficient to conduct analysis, but it does suggest that the high sand content in the streams bed and banks mobilizes during higher velocity events.

Implementation activities for the Keya Paha River watershed were incorporated within this Project which covers all of the subwatersheds that drain to Lewis and Clark Lake on the Missouri River. Site specific BMPs may yield some reductions, however the concentrations appear to be a natural condition for this river suggesting a reevaluation of the water quality standards may be a better long term solution.

Nutrient

Nutrient TMDLS have been set for Lake Dante, Lake Andes, Geddes Lake, and Burke Lake. The following tables summaries some of the information found in the TMDLs for these lakes.

Table 22: Summary of Reductions to Meet Nutrient TMDLs

	Total P as lb/yr			
Lake	**Reduction Needed**		**TMDL**	**Current**
Lake Dante	101	6.4%	1,474	1,575
Lake Andes	15,839	50.0%	15,839	31,677
Geddes Lake	615	30.0%	1,436	2,051
Burke Lake	24	77.8%	7	31

Recommendations for Lake Mitchell

1. - It is recommended that the implementation of appropriate Best Management Practices be targeted to the critical cells and priority animal feeding areas. Feeding areas with an AGNPS non-corrected rating above 30 should be evaluated for an animal waste collection system to minimize future nutrient releases. It is also recommended that all critical cells and feeding areas be field verified prior to the installation of any Best Management Practices. Since the model does not accurately predict the effects of summer long grazing, resource managers should address these concerns on a case by case basis. Improved grazing and riparian management will decrease bank erosion, increase sediment trapping efficiency, and reduce phosphorus in the streams.

2. - The three storm sewers entering the lake should be rerouted to a settling basin away from the lake. The storm sewers present a significant source of nutrient and sediment input, considering the size of the drainage (8% of the nitrogen and 4% of the phosphorus and 8% of the sediment load). Removing the storm sewers would also remove the potential of an urban area spill from entering the lake.

Table 23. Summary of recommended lake restoration techniques for Geddes Lake.

Restoration Technique	Action	Targets	Comments
Best Management Practices in the watershed.	Reduce incoming TP by 615.39 kg/yr. to reach acceptable loading rate of 1,435.91 kg/yr. (3.93 kg/day).	TP load of 1,435.91 kg/yr (3.93 kg/day) results in meeting adjusted Sec-Chl TSI target of 76.3	Based on FLUX and BATHTUB modeling.
In-lake phosphorus precipitation and bottom sealing.	Decrease growing-season in-lake TP concentration by 0.254 mg/l Chemical amounts to be determined by titrations and existing water chemistry.	TP decrease to an in-lake TP concentration of 0.126 mg/l results in meeting Sec-Chl TSI target of 63.4.	Based on TP – chlorophyll *a* relationship. Based on chlorophyll *a* – Secchi relationship. Probable need for repeated applications if no external phosphorus controls.
Aeration/circulation.	Aerate lake to compensate for whole lake oxygen deficit rate of 72.01 mg/m²-day.	Aerate until DO concentration is at least 5.0 mg/l.	Frequent monitoring of DO recommended for initiation and continuation of aeration.
Algicides.	Decrease chlorophyll *a* to concentration of 9 mg/m³.	Decreasing chlorophyll *a* to 9 mg/m³ results in Secchi of 0.37 meter and meeting Sec-Chl TSI target of 63.4.	Based on chlorophyll *a* – Secchi relationship. Monitor Secchi frequently. Use Secchi transparency target of 0.37 m to determine effectiveness or need for repeated treatment.
Sediment removal for lake longevity	Remove any amount of sediment to extend lake life.	Maintain minimal amount of sediment in the lake.	Success implied.

Table 24. Summary of recommended lake restoration techniques for Burke Lake.

Restoration Technique	Action	Targets	Comments
Phosphorus removal from tributaries by chemical precipitation.	Reduce incoming TP by 24.4 kg/yr. to reach acceptable loading rate of 7.0 kg/yr. Chemical amounts to be determined by titrations and existing water chemistry.	TP load of 7.0 kg/yr results in meeting Sec-Chl TSI target of 63.4. Also ensures pH of less than 9.0. May help alleviate low DO problems.	Based on BATHTUB modeling and chlorophyll *a* – pH relationship.
In-lake phosphorus precipitation and bottom sealing.	Decrease growing-season in-lake TP concentration by 0.131 mg/l Chemical amounts to be determined by titrations and existing water chemistry.	TP decrease to an in-lake TP concentration of .087 mg/l results in Sec-Chl TSI target of 63.4. Also ensures pH of less than 9.0	Based on TP – chlorophyll a relationship. Based on chlorophyll *a* – Secchi relationship. Based on chlorophyll *a* – pH relationship.
Aeration/circulation.	Aerate lake to compensate for hypolimnetic oxygen deficit rate of 510 mg/m²-day.	Aerate until DO concentration is at least 5.0 mg/l.	Frequent monitoring of DO recommended for initiation and continuation of aeration.
Algaecides.	Decrease chlorophyll *a* to concentration of 25 mg/m³.	Decreasing chlorophyll *a* to 25 mg/m³ results in Secchi of 1.14 meters and Sec-Chl TSI target of 63.4. Also ensures pH of less than 9.0	Based on chlorophyll *a* – Secchi relationship. Monitor Secchi frequently. Use Secchi transparency target of 1.14 m to determine effectiveness or need for repeated treatment.
Sediment removal for lake longevity	Remove any amount of sediment to extend lake life.	Maintain minimal amount of sediment in the lake.	Success implied. Possible nutrient control.

3.0 Project Description

3.1 Project Goal

The goal of the South Central Watershed Implementation Project is to restore the beneficial uses in the Lower James River Watershed, Lewis and Clark Lake, and the watersheds of Geddes, Academy, Platte Lake and Lake Andes Lake. This will be accomplished through the installation of Best Management Practices (BMPs) in the watersheds that target sources of sediment, nutrients, and fecal coliform bacteria. This project, Segment I, will address and target BMP installation in the entire South Dakota portion of the Lewis and Clark Lake Watershed (1.9 million acres), the Lower James River Watershed and its tributaries (2.6 million acres). It will also provide technical and financial assistance to the watershed activities in the Lake Andes, Geddes, Academy and Platte Lake Watersheds. These additional four watersheds add up to 560,000 additional acres and are tributaries of the Missouri River and Lake Francis Case which lies upriver and borders the Lewis and Clark Lake Watershed. The total project area acreage is 5,053,800 acres.

This project segment (Segment I) will:

- Continue BMP implementation in the Lewis and Clark Watershed, Geddes, Academy, Platte Lake, Lake Andes Lake Watershed, and impaired reaches of the Lower James River Watershed targeted towards installation of high priority BMPs identified in the Watershed Assessment.
- Conduct a public education and outreach campaign to educate and inform landowners, stakeholders, and area residents on water quality issues and BMPs associated with this project.

The practices that will be installed are based on information from the South Central Watershed area Assessments.

Project Objectives, Tasks, Products, Milestones, and Responsible Agencies:

Objective 1: Reduce nutrient, sediment and fecal coliform loadings in the South Central Watershed and the Lake Andes Watershed through the installation of Best Management Practices.

Task 1: Plan and implement cropland and grassland Best Management Practices (BMPs).
Provide assistance to landowners with installation of BMPs on cultivated cropland and grassland BMPs in the watershed that reduce fecal coliform bacteria, nutrient, and sediment loadings from cultivated cropland and grasslands. BMPs will primarily be installed with landowner investments along with USDA programs (EQIP/CRP/WHIP), as well as Wildlife agency programs (Partners for Wildlife, etc., US F&W and SD GF&P). Project funds for technical assistance on grassland and/or cropland BMP implementation will be targeted towards critical cells in riparian areas identified in the watershed assessment.

Product 1: 15,000 acres of cropland benefited from BMP installation by landowners.

BMPs installed by landowner will include filter strips, riparian buffers, tree plantings, conservation cropping systems, and grassed waterways on 15,000 acres of cultivated cropland to reduce nutrient and sediment loading. BMPs using 319 funds will only be located in the riparian area.

Product 1 Cost: $1,040,450 **Current Request: $0**

Milestones:

Sediment and nutrient loads will be reduced on 15,000 acres of cropland through the installation of cropland BMPs by June 30, 2021.

Product 2: Grassland Management Systems Installed on 75,000 acres of grasslands.

Grassland management systems will be designed and installed on 75,000 acres of grassland to reduce fecal coliform, nutrient, and sediment loading. Technical assistance for system planning will be requested from the SD Grassland Management and Planning Project and project Natural Resources Conservation Service (NRCS) field offices. BMPs will be implemented using funds from state and federal programs (EQIP, continuous CRP, and Wildlife Programs). BMPs planned to be installed include: planned grazing systems, fencing, livestock exclusion, grass seeding, pipelines, tanks, ponds, rural water hook-ups, and riparian buffers. Use of 319 funds to implement grazing management systems will be for riparian grasslands along major tributaries that have been identified as critical areas.

Product 2 Cost: $5,219,080 **Current Request: $678,000**
Future Request: $492,000

Milestones:

Install planned grazing system practices on 75,000 acres by September 30, 2021.

Product 3: Riparian Area Management (RAM) and Seasonal Riparian Area Management (SRAM) will be installed on 30 acres of riparian land.

RAM or SRAM will be implemented targeting critical riparian areas that have been 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 Firesteel, Dawson, Pierre or Wolf Creek. Enrollment of land immediately adjacent to these Creeks and within the 100 year flood plain is eligible for the SRAM program. Livestock producers enrolling pasture into the program will be paid 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.

Product 3 Cost: $275,000 **Current Request: $90,000**
Future Request: $60,000

Milestones:

Implement riparian livestock exclusion for 10 years or longer on 30 acres of riparian land by September 30, 2021.

Task 1 Total Cost: $6,534,530 **Current Request: $678,000**
Future Request: $552,000

Task 1 Responsible Agencies:

Technical Assistance Coordination:

Project Coordinator/Project Staff
James River Water Development District
Project Area Conservation Districts

Information Transfer:

Project Coordinator/Project Staff
James River Water Development District
Natural Resources Conservation Service
Project Area Conservation Districts

Implementation:

Project Coordinator/Project Staff
US Fish and Wildlife Service
Farmers and Landowners
Natural Resources Conservation Service
James River Water Development District
SD Game, Fish and Parks

Financial Assistance:

USDA – NRCS and FSA
319 Water Quality Projects
US Fish and Wildlife Service
SD Game, Fish, and Parks

Task 2: Reduce fecal coliform loadings originating from animal feeding operations.
Assist livestock producers with construction of ten (10) animal waste management systems, to include 10 nutrient management plans to reduce loading of fecal coliform bacteria, nutrients, and total suspended solids.

Product 4: 10 Animal Waste Management Systems (AWMS)
Ten (10) animal waste management systems, to include nutrient management plans, will be installed by livestock producers. Private consultants and NRCS will design the animal waste management systems, and develop the Agricultural Nutrient Management Plan. Funding for AWMS will be from this project's 319 funds, State Consolidated Funds, Landowners, NRCS EQIP program, and RCPP program. Ten of the AWMS are anticipated to be full containment systems in feedlot situations, and six systems are anticipated to be relocation of cow/calf feeding areas from critical stream/river riparian areas. The relocation of cow/calf feeding areas used seasonally will involve a contract with the landowner that includes a required grazing plan on days of use and season of use for the riparian pasture. Practices utilized for the feeding area relocation will include required fencing, water development, and fabricated and/or tree windbreaks.

Product 4:

Ten Ag Waste Management Systems	
Ten Engineering Design Services @ $21,000 each	$210,000
Ten Constructions @ $500,000 each	$5,000,000
Six Constructions @ $50,000 each (riparian feeding area relocation)	$300,000
Ten Nutrient Management Plans @ $4,000 each	$40,000

Milestones:

1. Ten animal waste management system designs.
2. Eight animal waste management systems constructed.
3. Six animal feeding area relocations (riparian protection).
4. Twelve nutrient management plans completed and implemented.

Product 4 Cost: $5,550,000 **Current Request: $369,700**
Future Request: $182,000

Task 2 Responsible Agencies:

Technical Assistance Coordination:

Project Coordinator/Project Staff
James River Water Development District
Project Area Conservation Districts

Information Transfer:

Project Coordinator/Project Staff
James River Water Development District
Natural Resources Conservation Service
Project Area Conservation Districts

Implementation:

Project Coordinator/Project Staff
Project Area Conservation Districts
USDA – Natural Resources Conservation Service (NRCS)
Private Consultants

Financial Assistance:

Water Quality 319 Projects
USDA – NRCS EQIP program
Consolidated Water Facilities Construction Fund

Objective 2: Provide project and BMP information to a minimum of 100 watershed landowners, 20 watershed organizations, and 2,500 area citizens to inform them of this project's need and progress, and the results and recommendations from the Phase I Watershed Assessment.

Task 3: Implement an Information and Education campaign to inform the public and stakeholders on project need and progress, results, and recommendations of the Watershed Assessment Final Report.

Product 5: Information and Education Campaign of informational meetings (2), tours (2), newsletters (3), steering committee meetings (6), and press releases (4) completed.

The project coordinator will provide assistance to James River Water Development District to complete an information and education campaign that includes on-farm tours, news releases, presentations to area stakeholder organizations, and an annual meeting of the project steering committee. The cost of information activities, including supplies and postage, will be provided to this 319 project and James River Water Development District and their partners.

Milestones:

2 informational meetings
6 Steering Committee Meetings
4 presentations to project partners
2 watershed BMP tours
4 news releases

Product 5 Cost: $ 10,000

Current Request: $3,000
Future Request: $2,000

Task 3 Responsible Agencies:

Technical Assistance Coordination:

Project Coordinator
James River Water Development District
Project Area Conservation Districts

Information Transfer:

Project Coordinator
James River Water Development District
Natural Resources Conservation Service
Project Area Conservation Districts

Implementation:

Project Coordinator
Natural Resources Conservation Service
SD Association of Conservation Districts

Financial Assistance:

USDA – NRCS and FSA
319 Water Quality Projects

Objective 3: Completion of water quality monitoring, monitor project progress and complete project administration and management to document project progress towards objectives and meet grant administration policy and guidelines.

Task 4: Monitoring water quality through water sampling related to BMP installation to assess changes in water quality from BMPs and from the initial watershed assessment sampling. Project staff will collect water samples to evaluate before and after water quality changes at the outlets of Creeks (Emmanuel, Choteau, etc.) for testing at the State Lab. Testing will be completed related to Total Suspended Solids, Fecal Coli Form Bacteria, and *E-coli*. Sampling will be completed utilizing technical assistance from the SD DENR and following procedures established in the "Standard Operating Procedures for Field Samplers, Volumes I & II, Tributary and In-Lake Sampling Techniques", State of South Dakota, 2005.

Product 6: Water Quality Monitoring to monitor project impacts:
200 water samples @ $65/test

Milestone:
200 water samples taken, tested, and water quality changes evaluated.

Product 6 Cost: $13,000 **Current Request: $7,800**
Future Requests: $5,200

Task 5: Monitor progress and complete progress reports and complete grant administration to meet project requirements and guidelines.

Product 7: Annual (5), final (1) reports completed according to grant guidelines and requirements.

Product 7 Cost: $0 **Current Request: $0**
The cost of these products is included in personnel costs.

Milestones:

1. 5 Annual Reports
2. 1 Final Project Report

Responsible Agencies:

Technical Assistance Coordination:

Project Coordinator/Project Staff
James River Water Development District
Project Area Conservation Districts

Information Transfer:

Project Coordinator/Project Staff
James River Water Development District
Natural Resources Conservation Service
Landowners

Implementation:

Project Coordinator/Project Staff
James River Water Development District
Project Area Conservation Districts
Landowners
SD Department of Environment and Natural Resources

Financial Assistance:

Water Quality 319 Projects
James River Water Development District
Project Area Conservation Districts

3.3 Milestone Table (See Page 35)

3.4 Required Permits

All required permits will be obtained for the installation of BMPs during this proposed project. It is anticipated that 401 and 404 permits and storm water construction permits will be required. If any historical findings are made, the state historic preservation office will be contacted. It is anticipated that:

- 401 and 404 permits will be required for shoreline and riparian BMP installation.
- Storm water construction permits will be required for animal waste management systems.
- Historical Preservation compliance will be adhered to any BMPs involving ground disturbing activities.
- Compliance to meet requirements of the Threatened and Endangered Species Act.

3.5 Project Sponsor

The James River Water Development District is the project sponsor. The Randall RC&D sponsored and implemented the Watershed Assessment for Lewis and Clark Watershed. James River Water Development District has experience in leadership for project implementation, administration, and management, and has a long-term working relationship with organizations and communities in the watershed area.

3.6 Operation and Maintenance Responsibilities

Operation and Maintenance (O&M) responsibilities for BMPs funded by 319 will be detailed in contracts entered in between the James River Water Development District and landowners installing BMPs. The contracts for BMP installation will specify BMP O&M needs, procedures for BMP failure or abandonment, and the life span BMPs will be maintained. The James River Water Development District will be responsible for completing operation and maintenance contracts, on-site evaluation of BMPs installed to ensure operation and maintenance is being completed, and follow-up as needed to ensure BMP operation for its designated life span.

4.0 COORDINATION PLAN

- The lead sponsor is the James River Water Development District, Huron, South Dakota. The James River Water Development District will be responsible for completion of the project's goals, objectives, tasks, and completion of cash and in-kind match documentation. The James River Water Development District, using project funds, will hire a project coordinator, project resource specialist, and support staff to lead project activities. Additional project support will be provided by the James River Water Development District and its technical assistance staff. James River Water Development District will partner with local, state, and federal organizations and agencies to implement this project utilizing their available technical and financial assistance as follows:

- Aurora, Bon Homme, Brule, Charles Mix, Davison, Douglas, Gregory, Hutchinson, Jerald, Miner, McCook, Sanborn, Todd, Hamill and Clearfield/Keya Paha Conservation Districts will provide project management assistance through Board of Supervisor membership on the local watershed steering committee, and provide technical assistance and coordination of technical assistance for BMP installation. The Conservation Districts will work with James River Water Development District to apply for additional funds for the installation of AWMS from the Land and Water Conservation Fund.

- USDA-Natural Resources Conservation Service: Technical assistance from the Aurora, Bon Homme, Brule, Charles Mix, Davison, Douglas, Gregory, Hutchinson, Jerald, Miner, McCook, Sanborn, Tripp, and Todd County NRCS County field office staff and NRCS state specialists for planning BMPs such as grazing systems, ag waste systems, riparian buffers, etc., and financial assistance for BMP installation from existing programs (EQIP, WRP, FWRP, RCPP).

- US Fish and Wildlife Service (US F&W): Through the North American Waterfowl Conservation Act (NAWCA) funded project, the US F&W Service will contribute cost-share assistance for grass seedings, ponds, and fencing, and provide technical assistance when available. Landowner match for NAWCA BMPs installed is not eligible as match to this project.

- SD Game, Fish and Parks: The SD GF&P, through existing programs to implement grassland and/or wetland BMPs (grazing systems, fencing, multiple purpose ponds, and seedings).

- Grassland Management Project – technical assistance to landowners on grazing systems methods and benefits, and on-farm assistance to develop a grazing plan.

- 303(d) Watershed Planning and Implement Project – Technical assistance for animal nutrient management systems, to include producer contacts.

- South Dakota Department of Environment and Natural Resources: Technical assistance for water quality issues and project implementation, administration, and management. Financial assistance will be requested from the Consolidated Water Facilities Construction Program to assist with cost-share of construction of animal waste management systems.

- USDA - Farm Service Agency: Cost-share assistance and program support for CRP, continuous CRP, WHIP, etc.

- South Dakota Department of Agriculture – Conservation Commission Land and Water Conservation Grant Program for tree planting and other conservation practices as needed.

4.2 Local Support

The South Central Watershed is an important economic and social asset to the communities in the project area, as well as rural residents and landowners. Randall RC&D Association, Inc. provided leadership for the Lewis and Clark Lake Watershed Assessment, which was initiated during 2003, due to significant local support. More than 15 organizations provided a cash contribution to the watershed assessment, and over 25 organizations were active in initiating and providing technical assistance to the assessment. During the two year assessment, Randall RC&D staff made over 20 presentations on the project need and progress to organizations in both South Dakota and Nebraska.

4.3 Project Coordination

The South Central Watershed Implementation Project will be implemented through leadership by the James River Water Development District, with support and coordinated by a local steering committee consisting of available local, state, and federal partners (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:

1. Annual 319 project coordinators training workshops.
2. Technical assistance for grassland management through the Grassland Management and Planning Project.
3. Technical and administrative training provided by the James River Water Development District, SD DENR, and NRCS.

4.4 Coordination With Other Projects

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

- BMP implementation: The installation of BMPs on cropland and grassland in this proposal will request funding by USDA programs (CRP, Continuous CRP, WHIP, EQIP) wildlife habitat programs (Partners for Fish and Wildlife, Threatened Habitats Program, landowners, and SD Soil and Water Conservation Grants and Consolidated Water Construction Facility Grants). The implementation of animal waste management systems is proposed to be cost-shared by 319 funds to provide timely planning, design, and implementation under current high demands on existing providers.
- Technical assistance for BMP implementation will be provided through a coordinated effort to include delivery by the project coordinator, NRCS field office staff, Conservation District staff, and existing 319 funded Grassland Project, USDA's technical service provider program, and other state and federal service providers as available (GF&P, US F&WS). Technical assistance resources will be invited to participate in the local project steering committee for coordination of services.

5.0 EVALUATION AND MONITORING

5.2 Indicators of Success

The James River Water Development District will monitor:

- Water Quality changes due to BMP installation and water quality changes since the 2003 watershed assessment on selected sites.

Project progress based on project milestones, and report progress in their semi-annual project reports. The effectiveness of BMPs installed relative to the improvement in water quality will be evaluated using the tools and models available such as:

1. Water sampling to monitor water quality changes.
2. AnnAGNPs model for changes in loadings due to BMP installation.
3. StepL for estimating annual load reductions from BMP installation.
4. Buffer and riparian vegetation establishment reductions for phosphorus and sediment modeled as grass seedings using Annualized AGNPS, as well as estimates from research studies conducted in the region by universities.
5. Assessment of feedlots to compare before and after BMP installation loadings using the AnnAGNPs module and water sampling on selected sites.

All BMPs installed in the watershed utilizing partner contributions (non-319 funds) will also be evaluated for improvements in water quality using the tools noted above.

Water sampling, testing, and test result evaluations for water quality changes will be completed with Technical Assistance from DENR to develop a sampling and analysis plan, train project staff, and assist in data storage and evaluation. Sampling will be completed according to the "Standard Operating Procedures for Field Samplers, Volumes I & II, Tributary and In-Lake Sampling Techniques", State of South Dakota, DENR, 2005.

Progress reporting to meet milestones will include a financial accounting of funds, and the source of funds for each milestone. Local support, partner in-kind, and cash contributions will be documented for BMP installation, project management activities, and informational activities.

5.3 Recordkeeping and data storage and management

The James River Water Development District will be responsible for collecting, storing, and managing data collected during the implementation of this project. The South Dakota DENR will provide technical assistance and guidance to assist the Randall RC&D set-up the appropriate record systems and computer software for project data collection. Water Quality data collected will be provided to SD DENR for entry into STORET.

5.4 AGNPS to determine progress/priority

The James River Water Development District will utilize the South Dakota DENR for technical assistance and training on the use of models and tools to assess project success and progress. The AnnAGNPs model (to include the feedlot model) will be the main models used to assess the impact of BMP installation in the watershed.

5.5 Operation and Maintenance

The installation of the BMPs for this project (animal nutrient management systems, fencing, water development, etc.) will involve a contract between the James River Water Development District and the landowner, for operation and maintenance of the BMP to be installed. The operation and maintenance section of the contract will specify the life span of the BMP, who is responsible for maintenance and operation, and normal operation and maintenance needs for each BMP.

The James River Water Development District will be responsible to ensure that the Operation and Maintenance contracts are implemented. The JRWDD and local partners, such as the project area conservation districts, will lead efforts to implement needed operation and maintenance on BMPs after this project's grant period.

6.0 BUDGET (See Also Project Budget Page on 36)

BUDGET TABLE FOR SOUTH CENTRAL IMPLEMENTATION PROJECT 7/2016 – 9/2021

PART 1: FUNDING SOURCES

Funding Source	Total
EPA SECTION 319 FUNDS & CWSRF-WQ FUNDS	
FY 16 319 (FA)	$1,550,000
Future Requests	$960,500
Subtotals	**$2,510,500**
OTHER FEDERAL FUNDS	
1.) NRCS/FSA (FA/TA)	$2,683.627
2.) Other Federal (RCPP)	$2.383.297
Subtotals	**$5,066,924**
STATE/LOCAL MATCH (FA&TA)	
1.) JRWDD (TA/FA)	$1,554,800
2.) Landowners(FA)	$2,652,806
3.) State: (Consolidated)	$1,032,500
4.) Dept. of Ag (Commission Grant)	$500,000
Subtotals:	$**5,740,106**
TOTAL BUDGET	**$13,317,530**

Key:

FA	Financial Assistance
TA	Technical Assistance
CD	Conservation District
CWFCF	Consolidated Water Facilities Construction Fund
GF&P	SD Game, Fish and Parks Department
DENR	SD Department of Environment and Natural Resources
NRCS	USDA Natural Resources Conservation Service
US F&W	US Fish and Wildlife Service
FSA	USDA Farm Service Agency
TSP	Technical Service Providers (USDA/NRCS)

7.0 PUBLIC INVOLVEMENT

7.1 Local work group members will meet at least semi-annually and provide input for project management and coordination of resources to the James River Water Development District, and will consist of representatives from local, state, and federal stakeholder organizations.

The James River Water Development District, through completion of Objective 2 (Information Campaign) of this proposal, will provide information to the public through Informational/Work Group meetings, progress reports, watershed tours, news releases, and presentations to partner organizations.

8.0 THREATENED AND ENDANGERED SPECIES

There has only been one federally threatened or endangered species documented in the Choteau Creek/Corsica Lake watershed. The US Fish and Wildlife Service list the whooping crane, bald eagle, and western prairie fringed orchid as species that could potentially be found in the Corsica Lake watershed. None of these species were encountered during this study; however, care should be taken when conducting mitigation projects in the watershed.

In the Lewis and Clark Lake Watershed endangered or threatened species documented include: Least Tern, Pallid Sturgeon, and Piping Plover, Bald Eagle, and Whooping Crane.

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 threatened and endangered species that could potentially be found in the area are as follows:

1. Whooping Crane

Whooping cranes have been documented in the Choteau Creek watershed and the South Central Watershed. Sightings in this area are likely only during fall and spring migration. When roosting, cranes prefer wide, shallow, open water areas such as flooded fields, marshes, artificial ponds, reservoirs, and rivers. Their preference for isolation and avoidance of areas that are surrounded by tall trees or other visual obstructions makes it unlikely that they will be present in the project area to be negatively impacted as a result of the implementation of BMPs. If whooping cranes are sighted during the implementation of mitigation practices, all disruptive activities should cease until the bird(s) leave of their own volition.

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. Bald Eagles are documented in the Lewis and Clark Watershed and use the reservoir and river for both summer and winter areas. A Bald Eagle refuge is located near Pickstown. 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.

3. Western Prairie Fringed Orchid

At this time there are no documented populations of the western prairie fringed orchid in South Dakota. *Platanthera praeclara* grows up to four feet tall, and has two dozen or more white to creamy colored, one-inch long flowers on a stalk. This species is distinguished from eastern prairie fringed orchids by larger flowers, differing petal shape, and longer nectar spur. The flowers emerge in May, bloom from June to July, and are pollinated by sphinx moths. Fringed orchids are found in tall grass prairies, most

often in moist habitats or sedge meadows, and require direct sunlight for growth. They persist in areas disturbed by light grazing, burning, or mowing. Western prairie fringed orchids are known to have occurred from northeastern Oklahoma, within the Ark/Red, as well as locations in Kansas, Missouri, Nebraska, Iowa, Minnesota, and South Dakota. The greatest threat to the species is conversion of tall grass prairie to other land uses. If an orchid is observed at any project work site, all mechanical activities at the site will be suspended. Work will be altered or the plant(s) protected so no harm will come to it.

4. Least Tern

The interior least tern is a small shorebird with a black-capped crown, white forehead, gray wings and back, and yellow or orange legs and bill. The male's legs and bill are brighter than the female's, but the sexes are similar. At just 8 to 9 ½ inches long, the least tern is the smallest species in the family Laridae. Least terns feed almost exclusively on small fish, which they catch by skimming over the water and plunging in. Least terns are listed as endangered on both the South Dakota state and the federal endangered species list. In South Dakota, least terns nest primarily on sandy unvegetated beaches and sandbar islands along the Missouri River. They tend to nest in large communal colonies. Project activities that disturb possible nesting sites or reduce food sources are not planned. If Least Tern(s) 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. If they remain a new site will be chosen. If any actions become necessary during the project that might impact least terns, the sponsor will contact DENR for approval to complete the action before proceeding.

5. Piping Plover

The piping plover is a small shorebird approximately seven inches long. It can be recognized by a single black neck band, a short, stout bill, pale underparts and orange legs. The piping plover is listed as threatened on both the federal and South Dakota State threatened or endangered species lists. Piping plovers nest primarily on unvegetated sandy islands on the Missouri River in South Dakota. Project activities that disturb possible nesting sites or reduce food sources are not planned. If Piping plover(s) 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. If they remain a new site will be chosen. If any actions become necessary during the project that might impact piping plovers, the sponsor will contact DENR for approval to complete the action before proceeding.

6. Pallid Sturgeon

The pallid sturgeon belongs to a group of fish that flourished about 70 million years ago during the Cretaceous period. The pallid sturgeon is a large fish. Historic reports and photographs document pallids at more than 80 pounds and six feet long. It has a flattened, shovel-shaped snout and long tail. Bony plates cover the body. Four dangling barbels hang in front of the toothless mouth. The pallid sturgeon is listed as endangered on both the federal and state endangered species list. No in-stream or lakeshore activities are planned. If any actions become necessary during the project that might impact the pallid sturgeon, the sponsor will contact DENR for approval to complete the action before proceeding.

3.3: MILESTONE TABLE

South Central Watershed Implementation Project

July 1, 2016 Through September 30, 2021

Goal/Objective/Task	Groups	Quantity	2016	2017		2018		2019		2020		2021	
			July-Dec	Jan-June	July-Dec.	Jan-June	July-Dec.	Jan-June	July-Dec.	Jan-June	July-Dec.	Jan-June	July-Sept.
Objective 1. BMP Installation													
Task 1: Crop & Grassland BMP's													
Products 1, 2 & 3: BMP's													
Cropland BMP's	1,2,3	15,000 ac.	1000	1000	2000	1000	2000	1000	2000	1000	2000		2000
Grassland BMP's	1,2,3,5,6	75,000 ac.	5000	5000	10000	5000	10000	5000	10000	5000	10000	5000	5000
Riparian Area Mgt. (RAM)	1,2,3,6	500 ac.	25	50	50	50	50	50	50	50	50	50	25
Task 2: Livestock Nutrient Management													
Products 4: Ag Waste Systems													
Engineering Services	1,3,7	10	1	1	1	1	1	1	1	1	1	1	
System Installation	1,3,4,7	10	1		2		2		2		2		1
Riparian feeding area relocation	1,2,3,8	6	1		1		1	1			1		1
Nutrient Management Plans	1,3	10	1		2		2		2		2		1
Objective 2: Outreach													
Task 3: Information Campaign													
Product 5:													
Tours	1,2,3,4	2		1					1				
Informational Meetings	1,2,3,4	2	1						1				
Presentations	1,2,3,4	5	1		1		1		1		1		
Steering Committee Meetings	1,2,3,4	10	1	1	1	1	1	1	1	1	1	1	
News Releases	1,2,3,4	6	1	1		1		1		1		1	
Objective 3: Monitoring/Reports													
Task 4: Water Quality Monitoring													
Product 6: Water Samples/Testing		200	24	16	24	16	24	16	16	16	16	16	16
Task 5: Reporting													
Product 7: Reports													
Semi-annual Reports (if needed)	1,4	0											
Annual Reports	1,4	6	1		1		1		1		1		1
Final Report	1,4	1											1

Groups:

1. James River Water Development (JRWDD Partners)
2. Area Conservation Districts
3. USDA - Natural Resources Conservation Service/Farm Service Agency
4. SD Department of Environment and Natural Resources
5. SD Game, Fish, and Parks
6. US Fish And Wildlife Service
7. Private Consultants

South Central Watershed Implementation Project Budget

July 1, 2016 Through September 30, 2021

ITEM	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Current 319 EPA	Future Requests	Consolidated	USDA EQIP/CRP	Local	Conservation Commission	JRWDD	RCPP
Project Personnel and Administration														
Project Coordinators (2 FTE)	$110,000	$113,300	$116,700	$120,200	$123,800	$584,000	$310,000	$157,200					$116,800	
RCPP Technical Assistance	$58,000	$58,000	$58,000	$58,000	$58,000	$290,000							$58,000	232,000
USDA Technical Assistance	$25,000	$25,000	$25,000	$25,000	$25,000	$125,000								125,000
Lodging/Meals/ Expenses	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	$3,000	$2,000						
Travel	$17,000	$17,000	$17,000	$17,000	$17,000	$85,000	$51,000	$34,000						
Computer Support	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000	$6,000	$4,000						
Office Supplies/Postage/Telephone	$4,000	$4,000	$4,000	$4,000	$4,000	$20,000	$12,000	$8,000						
Office Space	$9,000	$9,000	$9,000	$9,000	$9,000	$45,000				$45,000.00				
Project Management (Sponsor)	$4,000	$4,000	$4,000	$4,000	$4,000	$20,000	$9,000	$6,000			$5,000			
Clerical Assistance (CD's 200 hrs @ $30)	$1,200	$1,200	$1,200	$1,200	$1,200	$6,000	$2,000	$1,600			$2,400			
Equipment	$2,500			$2,500		$5,000	$2,500	$2,500						
Technical Assistance (CD's 500 hrs @ $30)	$3,000	$3,000	$3,000	$3,000	$3,000	$15,000	$6,000	$4,000			$5,000			
Subtotal: Personnel Support	**$236,700.00**	**$237,500.00**	**$240,900.00**	**$246,900.00**	**$248,000.00**	**$1,210,000.00**	**$401,500.00**	**$219,300.00**	**$0.00**	**$45,000.00**	**$12,400.00**	**$0.00**	**$174,800.00**	**$357,000.00**
Objective 1: BMP's Installation														
Task 1: Cropland/Grassland BMP installation														
Product 1: Cropland BMP's - 15,000 ac.														
Grass Waterway, Mulching, Field Borders, Seeding	$101,880	$101,880	$101,880	$101,880	$101,880	$509,400				$354,700				$154,700
Conservation Crop Rotation 5,000@18.59	$18,590	$18,590	$18,590	$18,590	$18,590	$92,950				$46,475				$46,475
Cover Crop 10,000 acres @ $40/acre	$80,000	$80,000	$80,000	$80,000	$80,000	$400,000				$138,250	$123,500			$138,250
Pollinator Habitat 25 acres@ $1500/acre	$7,500	$7,500	$7,500	$7,500	$7,500	$37,500				$18,750				$18,750
Salinity and Sodic Soil Man. 100 acres @ $6.00/acre	$120	$120	$120	$120	$120	$600								$600
Product 2 : Grassland BMP's - 75,000 acres:														
Prescribed grazing, fence, seeding, water development	$600,000	$600,000	$600,000	$600,000	$600,000	$3,000,000	$630,000	$460,000		$635,612	$389,406	$350,000		$534,982
Brush Management 2000 acres @ $359.54/acre	$143,816	$143,816	$143,816	$143,816	$143,816	$719,080				$459,540				$259,540
Livestock/Silt Retention dam Construction	$200,000	$200,000	$200,000	$200,000	$200,000	$1,000,000							$1,000,000	
Windbreak Establishment and Renovation	$100,000	$100,000	$100,000	$100,000	$100,000	$500,000	$48,000	$32,000		$5,000		$150,000	$255,000	$10,000
Product 3: Riparian Area Mgt. - 500 acres	$55,000	$55,000	$55,000	$55,000	$55,000	$275,000	$90,000	$60,000					$125,000	
Task 2: Livestock Nutrient Management														
Product 4: 10 Ag Waste Systems														
Engineering Design Services - 10 @ $21,000 each	$42,000	$42,000	$42,000	$42,000	$42,000	$210,000			$31,500	$63,000	$52,500			$63,000
System Construction - 10 @ $500,000 each	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$5,000,000	$220,000	$150,000	$950,000	$900,000	$1,980,000			$800,000
Winter Feeding Area - 6 @ $50,000 each	$60,000	$60,000	$60,000	$60,000	$60,000	$300,000	$143,000	$32,000	$45,000		$80,000			
(water, fencing, tanks, windbreaks)														
Nutrient Management Plans - 10 @ $4000 each	$8,000	$8,000	$8,000	$8,000	$8,000	$40,000	$6,700		$6,000	$17,300	$10,000			
Subtotal: BMP Installation	**$2,416,906**	**$2,416,906**	**$2,416,906.00**	**$2,416,906.00**	**$2,416,906.00**	**$12,084,530.00**	**$1,137,700**	**$734,000**	**$1,032,500**	**$2,638,627**	**$2,635,406**	**$500,000**	**$1,380,000**	**$2,026,297**
Objective 2: Outreach:														
Task 3: Information Campaign														
Product 5: (Informational meetings (2), tours (2),	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000	$3,000	$2,000			$5,000			
press releases (6)														
Subtotal: Outreach	**$2,000**	**$2,000**	**$2,000**	**$2,000**	**$2,000**	**$10,000**	**$3,000**	**$2,000**	**$0**	**$0**	**$5,000**	**$0**	**$0**	**$0**
Objective 3: Monitoring and Project Management														
Task 4: Water Quality Sampling/Evaluations														
Product 6: 200 samples/testing/evaluation @ $65/ea.	$2,600	$2,600	$2,600	$2,600	$2,600	$13,000	$7,800	$5,200						
Task 5: Reports And PIP Development:														
Product 7: Reports: semi-annual, annual, & final)														
(Costs covered in personnel costs)														
Subtotal: Monitoring and Reports	**$2,600**	**$2,600**	**$2,600**	**$2,600**	**$2,600**	**$13,000**	**$7,800**	**$5,200**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Project Cost:	**$2,658,206**	**$2,659,006**	**$2,662,406**	**$2,668,406**	**$2,669,506**	**$13,317,530.00**	**$1,550,000.00**	**$960,500**	**$1,032,500**	**$2,683,627**	**$2,652,806**	**$500,000**	**$1,554,800**	**$2,383,297**
Match:														
Ineligible Match - Federal and/or Project Allocated										$2,683,627				$2,383,297
319 Matching Project Total						$8,250,606.00	$1,550,000.00	$960,500						
Match: Project Totals For Match									$1,032,500		$2,652,806	$500,000	$1,554,800	
Match Percentages:						**100%**	**19%**	**12%**	**13%**		**32%**	**6%**	**19%**	