September 2010

PROJECT SUMMARY SHEET

AWARD FISCAL YEAR: 2007 PROJECT TITLE: **Lewis and Clark Watershed Implementation Project Segment III**

NAME: Randall RC&D ADDRESS: P.O. Box 247

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PROJECT TYPES (See List): Watershed

PROJECT LOCATION: LATITUDE: 43.2083 LONGITUDE :-98.2500

WATERSHED NAME: Lewis and Clark Lake

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

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 (FY-11) funds: $996,690.00
Local Match: $554,875.00
319 Funded Full Time Personnel: 2.0

Other Federal Funds: $649,175.00
Other Nonfederal Match: $263,300
Total Project Cost: $2,464,040.00

GOALS: The goal of the Lewis and Clark Watershed Implementation Project is to restore the beneficial uses in Lewis and Clark Lake, and the watersheds of Lewis and Clark Lake, 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. Initiated during 2006, Project Segment I targeted BMPs only in the 56,000 acre Corsica Lake subwatershed. In 2007 the Segment I Expansion added the East River portion of the watershed with 747,000 acres. This project, Segment III, will properly address and target BMP installation in the entire South Dakota portion of the Lewis and Clark Lake Watershed (1.9 million acres) and 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 now 2,465,000 acres.

PROJECT DESCRIPTION: This proposal is the third 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. 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 Lewis and Clark Lake Watershed Implementation Project is a 10-15 year TMDL implementation project (this proposal is Segment III). Through the installation of BMPs in the watersheds, this project will restore the water quality of the Lewis and Clark Lake watershed and the Lake Andes watershed to support the designated beneficial uses, reach the TMDL established for water bodies in these watersheds and start improving the watersheds overall health.

Like Segment II, Segment III will continue providing assistance for BMP installation in the project area and complete an information campaign to keep stakeholders informed of project activities and progress.

The Lewis and Clark Lake Watershed Project (Segment III) includes the 303d listed water bodies - Corsica Lake, Dante Lake and Lake Andes - assessed as part of the South Central Lakes Watershed Assessment project, and the water bodies where data collection and water sampling have been completed through the Lewis and Clark Initial Watershed Assessment. Water bodies studied under the Lewis and Clark study include the Keya Paha River, Ponca Creek, Sand Creek, Antelope Creek, Choteau Creek, Emanuel Creek, Slaughter Creek, Lewis and Clark Lake, Rahn Lake, and Roosevelt Lake. The Corsica Lake Watershed Assessment Final Report was completed during February 2005, Dante Lake's assessment report was completed in 2008, and Lake Andes is scheduled for completion during 2009. The Final Report for the Lewis and Clark Lake Initial Watershed Assessment is scheduled for completion in 2009, and the assessment reports along with stakeholder input will be the basis for the long term implementation strategy developed.

This Segment III, Lewis and Clark Watershed project will use available data from the watershed assessments (Lewis and Clark and South Central) and stakeholder input to prioritize BMP installation. Animal Feeding Area Assessments information available has been prioritized East River South Dakota Animal Feeding Areas; however, this information will not be available for the rest of the watershed until 2009. Initial information on priority BMPs in the western portion of the watershed was gathered at a stakeholders meeting on September 3, 2008 by Randall RC&D and the Lower James RC&D at Winner, SD. This meeting was attended by Conservation Districts, South Dakota DENR, L&CWIP staff, NRCS field office staff and tribal liaisons. Since then, Randall RC&D has held annual Steering Committee meetings to keep up with the priorities of the local conservation leaders. Assessment information gathered though the water sampling and data gathering portions of the Watershed Assessment for the Lewis and Clark Lake Watershed in South Dakota will be used as it is made available.

The beneficial uses for Lewis and Clark Lake (Missouri River from Ft. Randall Dam to Gavin's Point Dam), Corsica Lake, Dante Lake, Choteau Creek, Emmanuel Creek, Slaughter Creek, Ponca Creek, Keya Paha River, Sand Creek, Antelope Creek, Rahn Dam, Roosevelt Dam, and Lake Andes and Andes Creek are shown in Table 1 below. Attainment of the beneficial uses (Table 1) 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 segment of the implementation project will lay the groundwork necessary for successful restoration of Lewis and Clark Lake 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: Designated Beneficial Uses for the Lewis and Clark Lake Watershed Implementation Project Water bodies:

Beneficial Use	Lewis and Clark Lake	Corsica Lake	Dante Lake	Choteau Creek (Wagner to Mouth)	Lake Andes	Andes Creek	Emmanuel Creek	Academy Lake	Burke Lake	Geddes Lake
Domestic water supply waters	X									
Warm water permanent fish life propagation waters	X		X					X		
Warm water semi-permanent fish life propagation waters		X		X			X		X	X
Warm water marginal fish life propagation waters					X					
Immersion recreation waters	X	X	X		X			X	X	X
Limited contact recreation waters	X	X	X	X	X		X	X	X	X
Fish and wildlife propagation, recreation, and stock watering waters	X	X	X	X	X	X	X	X	X	X
Irrigation waters	X			X		X	X			
Commerce and industry waters	X									

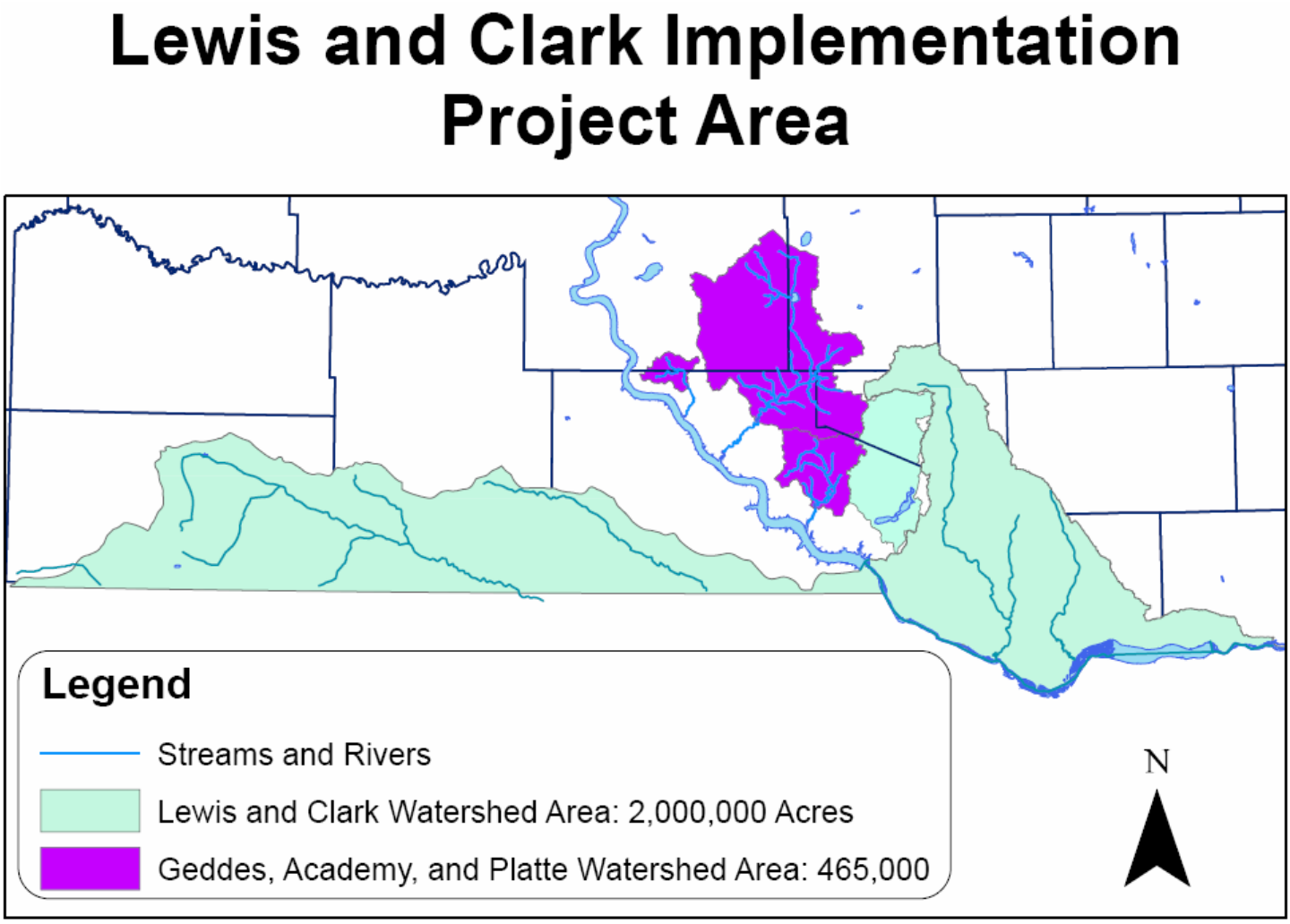
Table 1 Continued: Designated Beneficial Uses for the Lewis and Clark Lake Watershed Project Water bodies:

Beneficial Use	Ponca Creek	Keya Paha River	Rahn Lake	Roosevelt Dam	Slaughter Creek	Antelope Creek	Sand Creek	Platte Creek	Platte Lake	Fairfax Lake
Domestic water supply waters		X								
Warm water permanent fish life propagation waters			X	X						
Warm water semi-permanent fish life propagation waters	X	X				X				X
Warm water marginal fish life propagation waters								X	X	
Immersion recreation waters			X	X					X	N/A
Limited contact recreation waters	X	X	X	X		X		N/A	X	N/A
Fish and wildlife propagation, recreation, and stock watering waters	X	X	X	X	X	X	X	X	X	X
Irrigation waters	X	X			X	X	X	X		
Commerce and industry waters										

2.3 Lewis and Clark, Lake Andes, Geddes, Academy and Platte Watershed Map

Lewis and Clark Lake has a drainage area of approximately 10,000,000 acres, with 1,900,000 acres of the total in South Dakota (750,000 east river and 1,150,000 West River). The Lewis and Clark Watershed Implementation Project area (Segment III) includes the South Dakota portion of the Watershed, HUC# 10170101, 10150001, 10150006, and most of 10140101 which includes the 95,000 acre Lake Andes Watershed, and the recently added Watersheds of Geddes, Academy and Platte (Figure 1).

Figure 1: Lewis and Clark Lake, Lake Andes, Geddes, Academy and Platte Watersheds.



The Lewis and Clark Watershed Project area includes three Ecoregions:

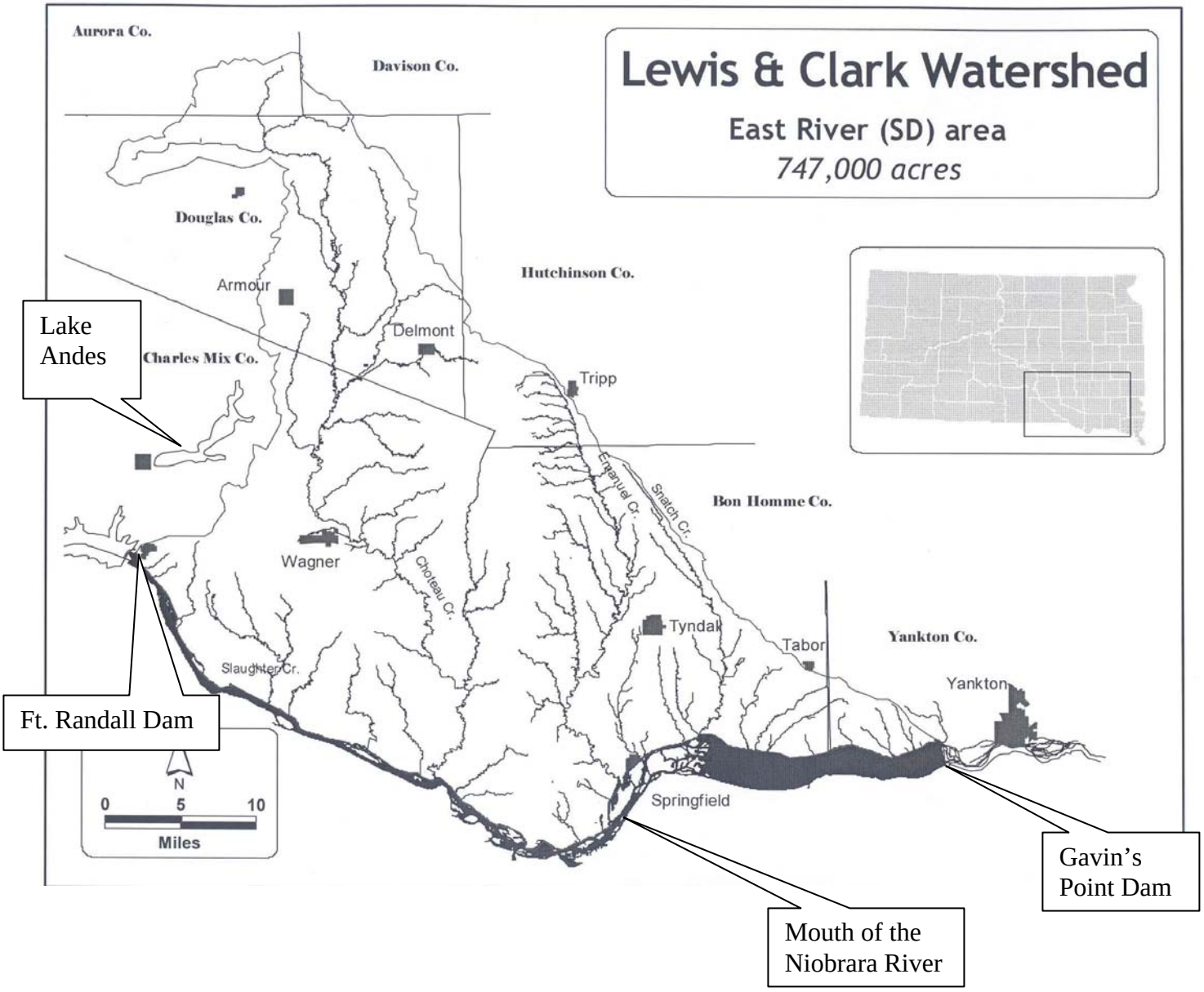
1. Northern Glaciated Plains: East River portion of the watershed and most of Gregory County and parts of Tripp County bordering the west side of the Missouri River to include most of the Ponca Creek watershed. This area marks the westernmost extent of continental glaciations' and is approximately 65% of the project area.
2. Northwestern Great Plains: Western portion of the watershed associated with the Keya Paha River watershed in South Dakota. It is a semiarid rolling plain of shale, siltstone, and sandstone punctuated by occasional buttes and badlands.
3. Nebraska Sandhills: Westernmost small area of the watershed that is in the sandhills (dune sand) and the Niobrara River Watershed.

The East River portion of Lewis and Clark Lake Watershed (Figure 2) in South Dakota is bordered on the South by the Missouri River (Ft. Randall Dam at Pickston to Gavin's Point Dam at Yankton). The Niobrara River (8,000,000 acre = 1/3 of the total drainage) is the primary Nebraska drainage into Lewis and Clark Lake entering the lake near Niobrara, Nebraska.

Andes Creek (Lake Andes) is a tributary of the Missouri River flowing in above Ft. Randall Dam into Lake Francis Case. The Andes Creek Watershed borders the Lewis and Clark Lake Watershed.

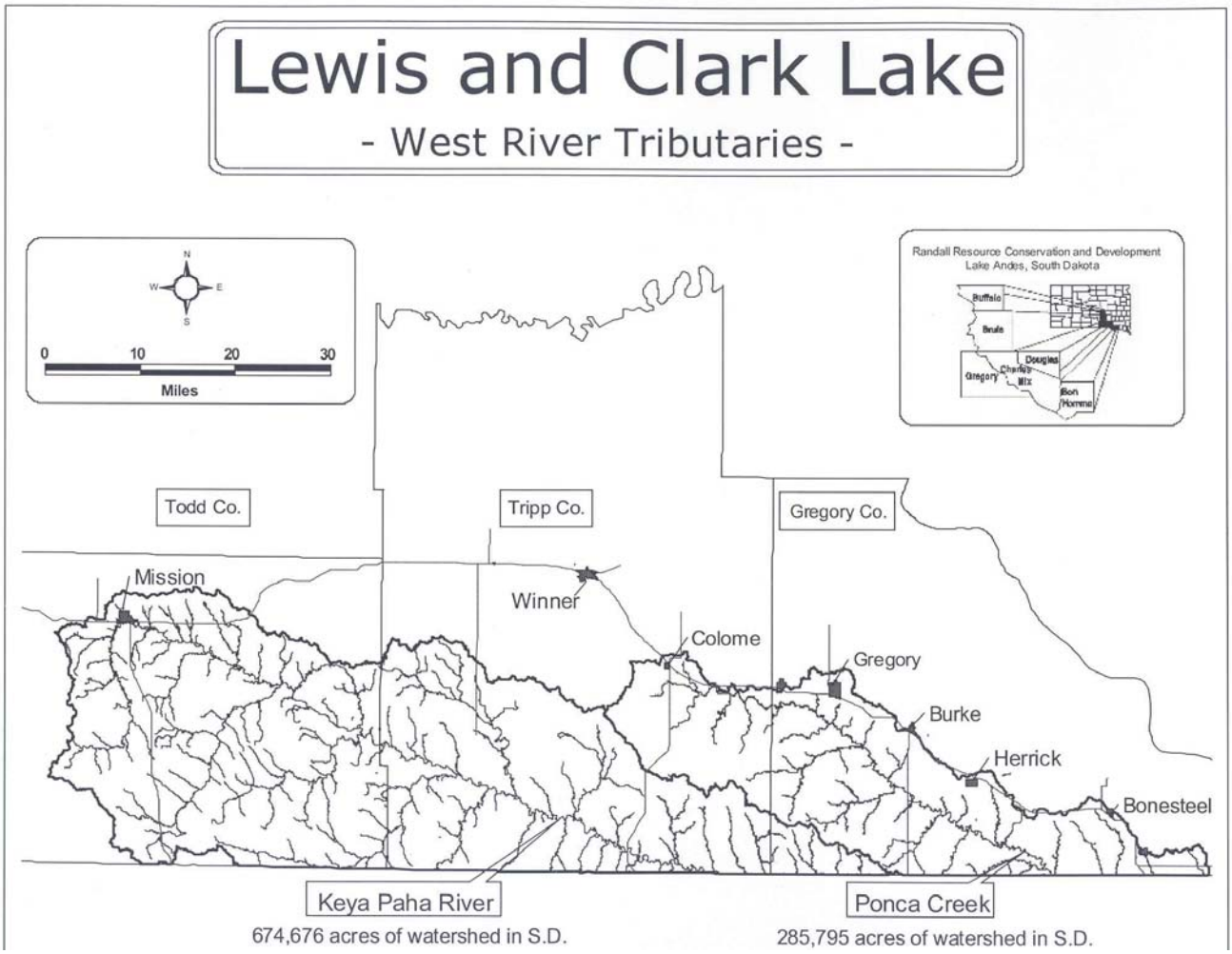
Priority water bodies located in the East River portion of the project watershed include: (see figure 2) Lewis and Clark Lake, Corsica Lake, Dante Lake, Lake Andes, Choteau Creek, Emmanuel Creek, And Slaughter Creek.

Figure 2: East River portion of the Lewis and Clark Lake Watershed with Lake Andes, Niobrara River Mouth, Ft. Randall Dam and Gavin's Point Dam locations identified.



The West River portion of the Lewis and Clark Lake Watershed (Figure 3) consists of the Ponca Creek and Keya Paha River watersheds. Ponca Creek is a direct tributary to the Missouri River originating in South Dakota, and then passing through portions of Nebraska before entering the Missouri from the Nebraska side (south). Roosevelt Lake is located in the Ponca Creek watershed. The Keya Paha River is a tributary of the Niobrara River, entering the Niobrara in Nebraska prior to the Niobrara's entrance into the Missouri River. Rahn Lake, Antelope Creek and Sand Creek are located in the Keya Paha River watershed.

Figure 3: West River Portion of the Lewis and Clark Watershed (1,150,000 acres):



2.4 General Watershed Characteristics

Land use in the project area is primarily cropland and grazing. Row crops and hay are the main crops on cultivated lands. Land use transitions from livestock grazing (80% grassland land use) and small grains in the western portion of the watershed to row crops (70% land use) in the eastern portions.

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.

2.5 Water Quality Impairments

A Watershed Assessment for the Lewis and Clark Watershed was initiated during January of 2003 at the request of several local organizations that expressed concerns relative to sediment loading of Lewis and Clark Lake. The original scope of the project was intended to identify areas and causes of sediment to the reservoir, and begin developing remediation strategies to reduce the amount of sediment entering the impoundment. South Dakota Department of Environment and Natural Resources (DENR) made an informal agreement with the Nebraska Department of Environmental Quality (NEDEQ) to share data collected in the watershed, and discuss mitigation activities upon completion of the assessment. Additional concerns were discovered during the first year of the assessment, and as a consequence, the

monitoring strategy was modified to assess the presence of large numbers of animal feeding operations and TMDLs for several smaller lakes, creeks, and rivers located within the drainage (see table 1 above for listed water bodies in the watershed and table 2 below for water bodies listed as not meeting all of their beneficial uses).

Segment I of the Lewis and Clark Watershed Implementation Project was initiated in 2006 focusing on the Corsica Lake watershed and development of a long term Project Implementation Plan for the entire South Dakota Lewis and Clark Lake Watershed. BMP installation in the Corsica Lake watershed was based on the priorities identified in the completed watershed assessment final report, and the TMDL established for Corsica Lake during 2005.

During 2007 the project was expanded to include the portion of watershed in eastern South Dakota and extended through 2009. This expansion was based on available data from the watershed assessment ranking feeding areas for priority assistance in the expansion area. During 2008, local support for implementation in the watershed west of the Missouri River and in the Lake Andes watershed resulted in the expansion of the project to the entire SD Lewis and Clark Watershed, and inclusion of the Lake Andes watershed. The Lake Andes Watershed is not in the Lewis and Clark Lake Watershed, and was assessed under the South Central Lake Assessment Project. The final assessment report for Lake Andes was completed during February 2010.

Table 2 shown below identifies water bodies in the Lewis and Clark Watershed Implementation Project Area (Segment III) listed in the "2008 South Dakota Integrated Report for Surface Water Quality Assessment" as not meeting their designated beneficial use(s). The causes of water bodies not meeting their designated beneficial uses listed in Table 2 below can be summarized as:

- Lakes not meeting designated beneficial uses are limited due to their Trophic State Index caused by nutrient enrichment and siltation (Andes, Burke, Corsica, Dante, Geddes, Rahn, , and Roosevelt).
- Rivers and creeks not meeting designated beneficial uses are limited due to Total Suspended Solids and Fecal Coliform from siltation and livestock operations (Emmanuel, Ponca, Keya Paha, and Choteau).
- Lake Andes and Corsica Lake do not meet beneficial designated uses due to dissolved oxygen in addition to Trophic State Index.

The impairments to the lakes and streams are generally caused by agricultural nonpoint sources of pollution. The exceptions to impairments being listed as caused by agricultural nonpoint sources for this project's water bodies are:

- Slaughter Creek does not meet its designated uses for irrigation waters, Fish/Wildlife propagation, Recreation, and Stock water due to total dissolved solids and specific conductance. Slaughter Creek's listed sources of impairment are natural causes.
- Roosevelt Lake does not meet its beneficial use for warmwater fish life due to mercury in fish tissue.

Table 2: Lewis and Clark Watershed Implementation Project Water bodies and their designated beneficial uses listed as not being met.

	Designated Beneficial Uses Not Being Met							
Water body	Immersion Recreation	Limited Contact Recreation (Fecal coliform)	Warm Water Marginal Fish Life	Warm Water Permanent Fish Life	Warm Water Semi-Permanent Fish Life	Fish/ Wildlife Prop, Rec, Stock	Irrigation Waters	303(d) listed
Burke Lake					X			
Dante Lake				X				
Choteau Creek (Wagner to Mouth)					X			X
Lake Andes	X	X	X					X
Emmanuel Creek		X			X			X
Geddes Lake					X			X
Ponca Creek		X						X
Keya Paha River		X			X			
Rahn Lake				X				
Roosevelt Lake			X					
Slaughter Creek						X	X	

This proposal, Segment III, will continue to assist landowners in installation of BMPs that restore or maintain water quality to meet the designated beneficial uses and TMDLs established. A preliminary summary of the data provided from the watershed assessment is included below.

Summary of Study Findings for Lewis and Clark Lake Watershed.

Fecal Bacteria

The data indicated that over 100 animal feeding operations contribute fecal contamination to the tributaries of Lewis and Clark Reservoir. In many cases, the concentrations of fecal coliform bacteria were too high for human recreation. TMDLs for fecal coliform bacteria have been developed for Keya Paha, Ponca, Choteau, and Emmanuel Creek. 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 assessment is available and has been used to prioritize feedlots in the project area.

Table 3: Fecal 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

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: Fecal Source Allocation for Ponca Creek

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

Table 6: TMDL Summary for Fecal Coliforms in Ponca Creek

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 7: Fecal Source Allocation for Emanuel Creek

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

Table 8: TMDL Summary for Fecal Coliforms in Emanuel Creek

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*			

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 4 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 5). 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.

RGA scores throughout the remainder of the basin indicated a range of conditions. Unstable sites found upstream of the highlighted section in Figure 5 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 9: Choteau Creek from Wagner to its Confluence with Lewis and Clark Lake Total Maximum Daily Load by Flow Regime

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.*

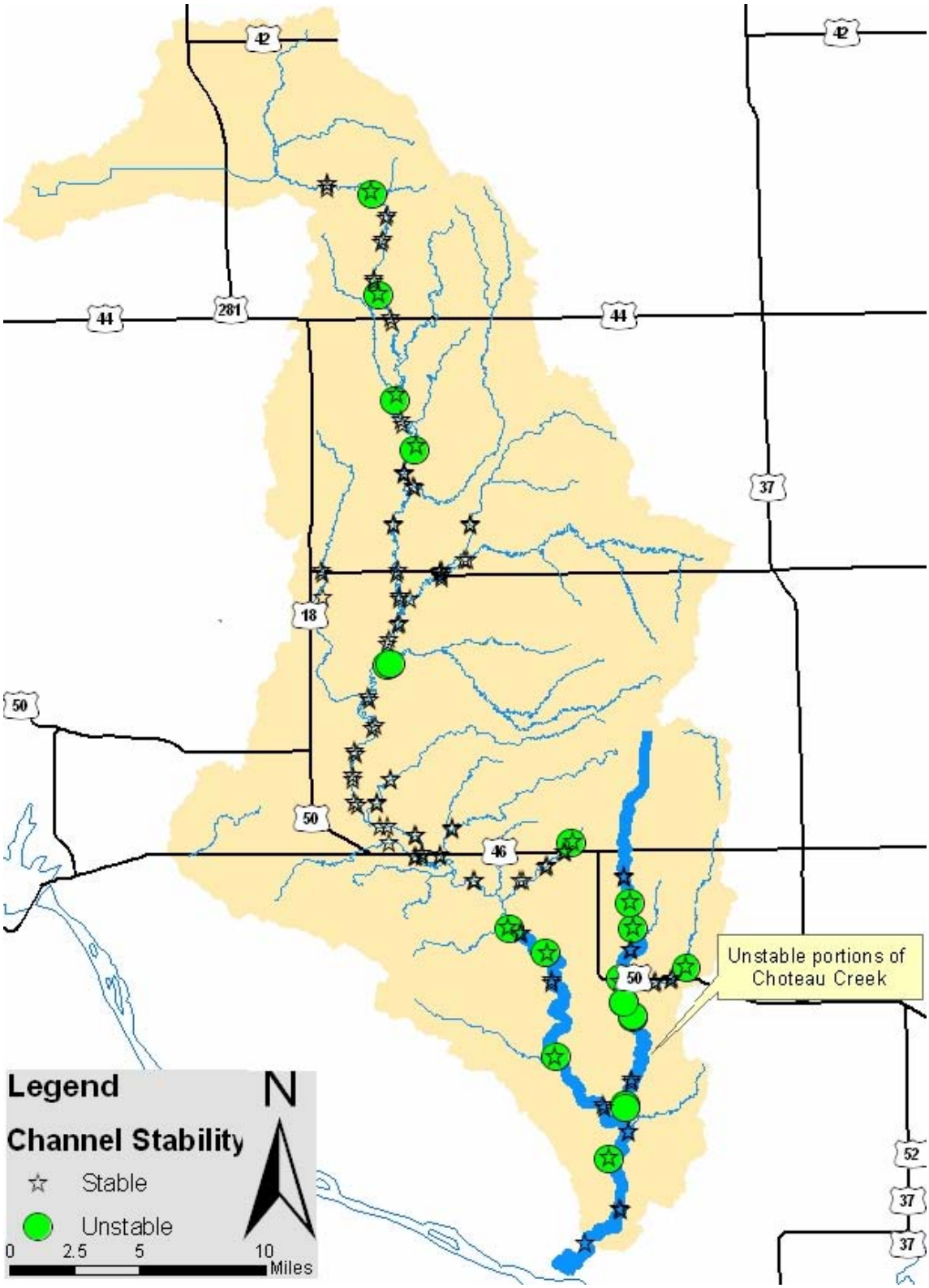


Figure 5. Choteau Creek RGA Locations.

Emanuel TSS

A number of rapid geomorphic assessments (RGAs) were conducted on portions of Emanuel Creek located downstream of Highway 50 (Figure 6). 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

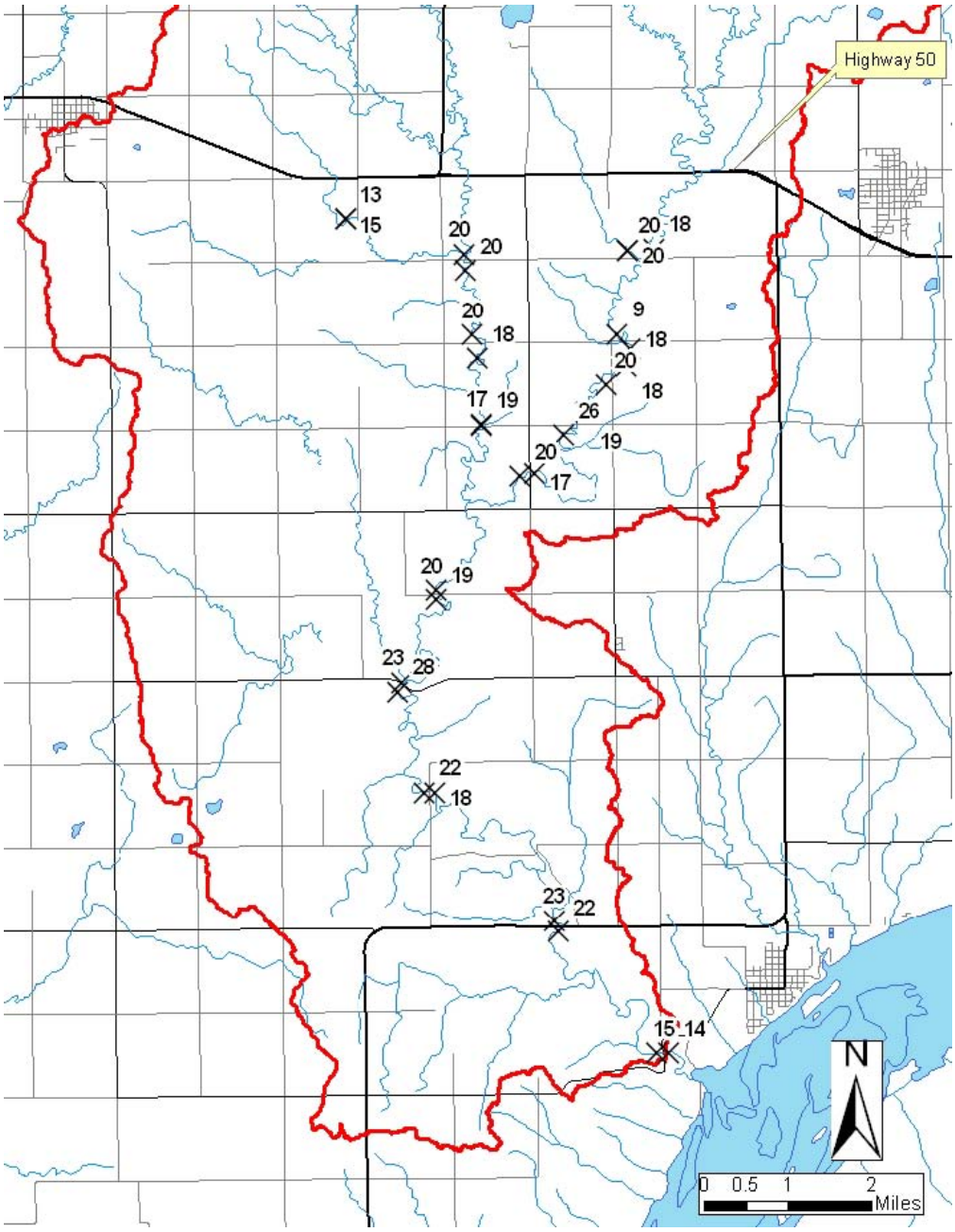


Figure 6. Emmanuel Creek RGA Locations with score.

Table 10: Emanuel Creek from Section 20 of Township 94 North, Range 60 West to its Confluence with Lewis and Clark Lake Total Maximum Daily Load by Flow Regime.

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.

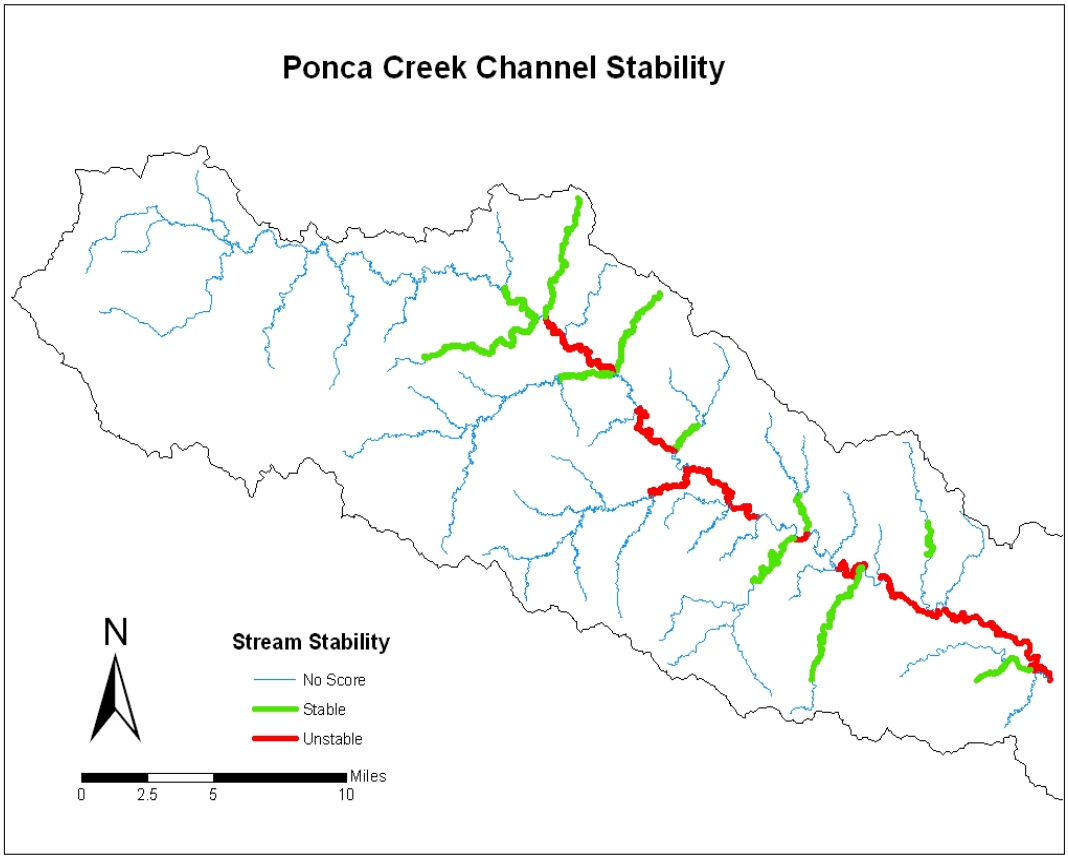


Figure 7: Ponca Creek Channel Stability.

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 8.

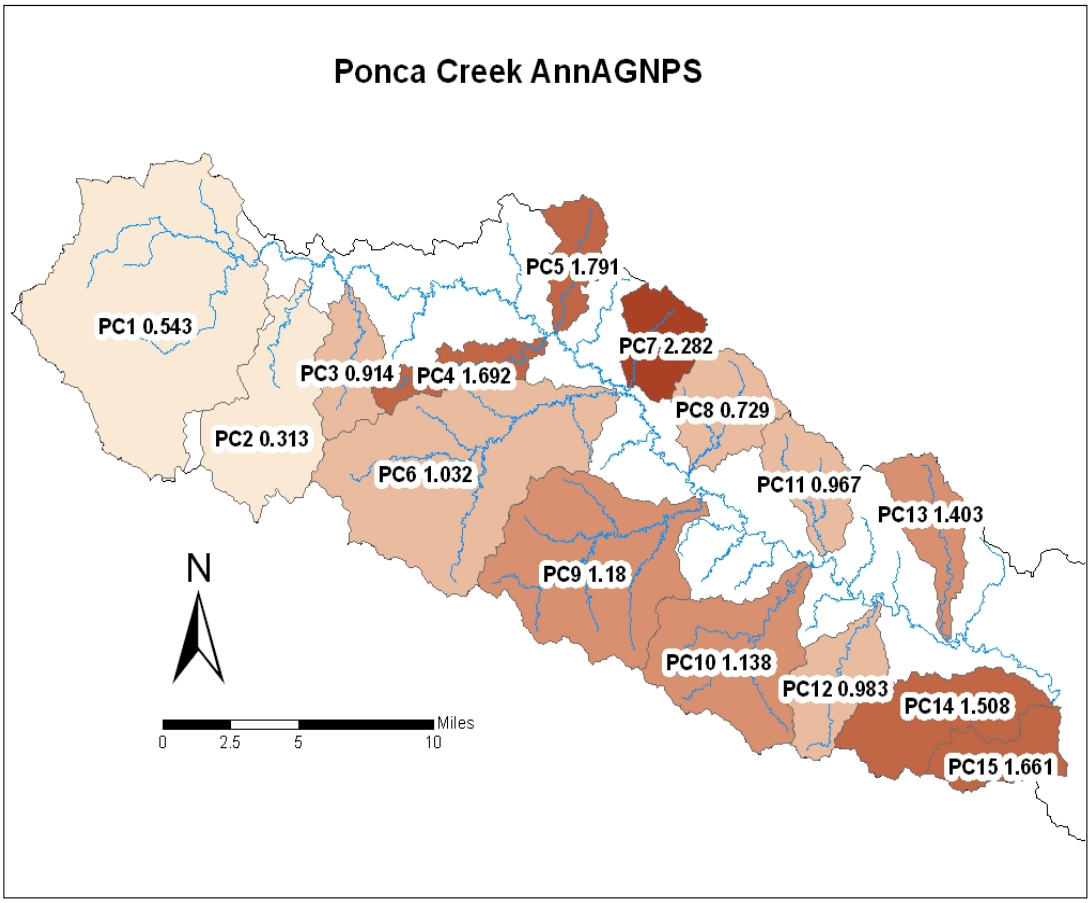


Figure 8: Sediment Production for Ponca Creek.

Table 11: Ponca Creek from Highway 183 to the Nebraska Border Total Maximum Daily Load by Flow Regime

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.*

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 12: 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

Table 13. 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 14. 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 Lewis and Clark Watershed Implementation Project is to restore the beneficial uses in Lewis and Clark Lake, and the watersheds of Lewis and Clark Lake, 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. Initiated during 2006, Project Segment I targeted BMPs only in the 56,000 acre Corsica Lake subwatershed. In 2007 the Segment I Expansion added the East River portion of the watershed with 747,000 acres. This project, Segment III, will properly address and target BMP installation in the entire South Dakota portion of the Lewis and Clark Lake Watershed (1.9 million acres) and 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 now 2,465,000 acres.

This project segment (Segment III) will:

- Continue BMP implementation in the Lewis and Clark Watershed, Geddes, Academy, Platte Lake and Lake Andes Lake 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 the Lewis and Clark Lake Watershed.

The practices that will be installed are based on information from the South Central Lakes Watershed Assessment and the Lewis and Clark Watershed Assessment, and are summarized in Table 15.

Table 15. Estimated Best Management Practices Implementation by Acres and Project Segment for South Dakota Lewis and Clark Lake Watershed Area "Shaded area is Segment 3"

Best Management Practices identified in the Watershed Assessments	Estimate of Acres/Practices to attain Project Goal (July 2006) Start	Segment 1* (Through 6/30/2009) Progress completed As of August 25, 2008	Estimate of Acres/Practices Segment 2 (2 years period) (end of year 5) (July 2011) Aug.26, 2008 to Sept. 30, 2011	Estimate of Acres/Practices Segment 3 (2 years period) (end of year 7) (July 2013) Segment 3
Cropland BMPs				
Filters/Buffer Strips, Grassed Waterways, Conservation Cover, Tree Planting	42,000 acres	20,975 acres	10,000 acres	20,000 acres
Grassland BMPs				
Planned Grazing Systems, Grass Seeding, Riparian Buffers, Grassed Waterways, Riparian Area Management	161,200 acres	8164 acres	4000 acres	10,000 acres
Animal Waste Management	100	8	10	10

* Segment I includes Segment I from (July 2006 to July 2008) and Segment I Expansion ended July 2009

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

Objective 1: Reduce nutrient, sediment and fecal coliform loadings in the Lewis and Clark 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 for grassland and/or cropland BMP implementation will be targeted towards critical cells in riparian areas identified in the watershed assessment.

Product 1: 20,000 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 20,000 acres of cultivated cropland to reduce nutrient and sediment loading.

Product 1: Total Cost: $75,000 319 Cost: $18,750

Milestones:

Sediment and nutrient loads will be reduced on 20,000 acres of cropland through the installation of cropland BMPs by June 30, 2013. (See BMP schedule Milestone Table, section 3.3).

Product 2: Grassland Management Systems Installed on 10,000 acres of grasslands.

Grassland management systems will be designed and installed on 10,000 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 cells, and where other sources of cost-share is not available.

Product 2: Total Cost: $194,500 319 Cost: $116,700

Milestones: (See Milestone Table – Page 35)

1. Install planned grazing system practices on 10,000 acres to reduce sediment, nutrient, and fecal coliform loading by June 30, 2013. (See BMP schedule – Milestone Table section 3.3)

Product 3: Riparian Area Management (RAM) will be installed on 100 acres of riparian land.

The RAM Program is a livestock exclusion set aside type program for riparian land. It is designed to reduce phosphorus, suspended solids, and fecal coliform bacteria loading by ensuring that tracts of land not eligible for the USDA Continuous Conservation Reserve Program become protected as riparian buffers. This land must be located on or in close proximity to priority stream segments. DENR RAM Program guidelines issued in April of 2010 will be followed.

Product 3: Total Cost: $90,000 319 Cost: $67,500

Milestones: (See Milestone Table – Page 35)

1. Implement riparian livestock exclusion for 10 years or longer on 100 acres or riparian land to reduce phosphorus, suspended solids, and fecal coliform bacteria loading to streams by June 30, 2013.

Task 1: Total Cost: $359,500 319 Cost: $202,950

Responsible Agencies: Task 1:

Technical Assistance Coordination:

Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
Project Area Conservation Districts

Information Transfer:

Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
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
SD Association of Conservation Districts
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 sixteen (10) animal waste management systems, to include 12 nutrient management plans to reduce loading of fecal coliform bacteria, nutrients, and total suspended solids.

Product 4: 16 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, and the NRCS EQIP program. Eight of the AWMS are anticipated to be full containment systems in feedlot situations, and two 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 (10) Ag Waste Management Systems	
Twelve Engineering Design Services @ $18,500 each	$222,000
Ten Constructions @ $150,000 each	$1,500,000
Two Constructions @ $20,000 each (riparian feeding area relocation)	$40,000
Twelve (12) Nutrient Management Plans @ $2,500 each	$30,000

Milestones: (See Milestone Table – Page 35)

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

Task 2: Total Cost: $1,792,000 319 Funds: $469,700

Responsible Agencies: Task 2:

Technical Assistance Coordination:
Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
Project Area Conservation Districts

Information Transfer:
Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
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

Monitoring Assistance:
Project Coordinator
SD Department of Environment and Natural Resources

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 (4), steering committee meetings (2), and press releases (4) completed.

The project coordinator will provide assistance to Randall RC&D 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 Randall RC&D and their partners.

Milestones: (See Milestone Table – Page 35)

2 steering committee meetings
2 presentations to project partners
2 watershed BMP tours
4 news releases
4 newsletters (watershed project)

Task 3: Product 5: Total Cost: $ 12,000 319 Costs: $ 4,000

Responsible Agencies:

Technical Assistance Coordination:
Project Coordinator
Randall Resource Conservation and Development Association, Inc.
Project Area Conservation Districts

Information Transfer:
Project Coordinator
Randall Resource Conservation and Development Association, Inc.
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 and after storm events to assess changes in water quality from BMPs and from the initial watershed assessment sampling. Project staff will collect water samples related to installation of animal waste systems to evaluate before and after water quality changes and related to storm events 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 EColi. 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:

*12 water samples @ $65/test (Before and After – BMP installation)	$780.00
*12 water samples @ $65/test (Creek outlets – storm events)	$780.00

Milestone: (See Milestone Table – Page 35)

24 water samples taken, tested, and water quality changes evaluated.

Task 4: Product 6: Cost: Total Cost: $1,560 319 Cost: $1,560

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

Product 7: Semi-annual (2) annual (2), final (1) reports completed according to grant guidelines and requirements.

Task 5: Product 7: Total Cost: $0 **319 Cost: $0**
The cost of these products is included in personnel costs.

Milestones: (See Milestone Table, page 35)

1. 2 Semi-annual Reports
2. 2 Annual Reports
3. 1 Final Project Report
4. Project Implementation Plan

Responsible Agencies:

Technical Assistance Coordination:

Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
Project Area Conservation Districts

Information Transfer:

Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
Douglas, Aurora, and Charles Mix Conservation Districts
Natural Resources Conservation Service
Landowners

Implementation:

Project Coordinator/Project Staff
Randall Resource Conservation and Development Association, Inc.
Project Area Conservation Districts
Landowners
SD Department of Environment and Natural Resources

Financial Assistance:

Water Quality 319 Projects
Randall Resource Conservation and Development Association, Inc.
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 Randall Resource Conservation and Development (RC&D) Association, Inc. is the project sponsor. The Randall RC&D sponsored and implemented the Watershed Assessment for Lewis and Clark Watershed and is the sponsor of the current Lewis and Clark Watershed Implementation Project. Randall RC&D 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 Randall RC&D Association, Inc., 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 Randall RC&D 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 Randall RC&D Association, Inc., Lake Andes, South Dakota. The Randall RC&D will be responsible for completion of the project's goals, objectives, tasks, and completion of cash and in-kind match documentation. The Randall RC&D, 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 Randall RC&D Council and its technical assistance staff. Randall RC&D will partner with local, state, and federal organizations and agencies to implement this project utilizing their available technical and financial assistance as follows:

  - South Dakota Association of Conservation Districts (SDACD): The Randall RC&D Association will work to continue to contract with SDACD to provide skilled staff (project coordinator, etc.) to lead project implementation. SDACD staff will also be requested to provide assistance through several of its existing 319 funded technical assistance projects.

  - Aurora, Brule, Douglas, Charles Mix, Bon Homme, Hutchinson, Yankton, Gregory, 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 the Randall RC&D Council 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, Douglas, Bon Homme, Hutchinson, Davison, Yankton, Charles Mix, Gregory, Todd, Hamill, and Tripp 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).

  - 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 in Douglas, Aurora, and Davison Counties. 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.

- Lewis and Clark Watershed Implementation Project Steering Committee - A steering committee is providing assistance to Randall RC&D for project management, development of the Project Implementation Plan, and coordination of technical and financial assistance providers. Partners who will be asked to serve on the local work group will include those who provided technical and/or financial assistance to the Watershed Assessment and includes (the partners identified individually in this section are not listed) Yankton Chamber of Commerce/Development Corporation, Spring-Bull Creek Watershed, City of Springfield, City of Yankton, Village of Niobrara, Middle Niobrara NRD, Lewis and Clark NRD and Knox Rural Water, Northeast and North Central RC&D, and Lewis and Clark SD/NE Preservation Association.

- South Central Water Development District - Will provide financial assistance for project implementation on a case by case basis and technical assistance for project management, to include membership on the local work group.

- The South Central and Lower James RC&D's service area is part of the Lewis and Clark Lake Watershed, and the RC&Ds will provide technical assistance for project management.

4.2 Local Support

The Lewis and Clark Lake 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.

The Randall RC&D invited stakeholders to a meeting September 4, 2008, at Winner to solicit input and support for the development of this project in the newest expansion area (West River). The Segment II, Lewis and Clark Watershed Implementation Project, through meetings with project partners by the project staff and RC&D, are continually gathering input and support for project activities. The current project is ahead of schedule on BMP installation due to local support by landowners and partners.

4.3 Project Coordination

The Lewis and Clark Watershed Implementation Project will be implemented through leadership by the Randall RC&D, 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 SD Association of Conservation Districts, 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, existing 319 funded Grassland Project, existing 319 funded SDACD watershed assistance 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 Randall RC&D Association, Inc. 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 Randall RC&D Association, Inc. 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 Randall RC&D 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 Randall RC&D Association, Inc. 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 Randall RC&D will be responsible to ensure that the Operation and Maintenance contracts are implemented. The RC&D 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 23)

BUDGET TABLE FOR LEWIS AND CLARK LAKE WATERSHED PROJECT, SEGMENT II
7/2011 – 6/2013

PART 1: FUNDING SOURCES

Funding Source	Total
EPA SECTION 319 FUNDS	
1.) FY 11 (FA)	$996,690
Subtotals	$996,690
OTHER FEDERAL FUNDS	
1.) NRCS/FSA (FA/TA)	$641,250
2.) Other Federal	$ 7,925
Subtotals	$649,175
STATE/LOCAL MATCH (FA&TA)	
1.) RANDALL RC&D (FA/TA)	$11,000
2.) Local CD (TA)	$5,000
3.) Landowners(FA)	$543,875
5.) State: (CWFCF)	$258,300
Subtotals:	$818,175
TOTAL BUDGET	$2,464,040

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 Randall RC&D, and will consist of representatives from local, state, and federal stakeholder organizations.

The Randall RC&D, 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 Lewis and Clark Lake 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

Lewis and Clark Watershed Implementation Project Segment III Milestones

July 1, 2011 Through June 30, 2013

Goal/Objective/Task	Groups	Quantity	Year 1				Year 2			
			Jan-Mar	Apr-June	July-Sept.	Oct-Dec	Jan-Mar	Apr-June	July-Sept.	Oct-Dec
Objective 1. BMP Installation										
Task 1: Crop & Grassland BMP's										
Products 1, 2 & 3: BMP's										
Cropland BMP's	1,2,3	10000 ac.		2000	3000			3000	2000	
Grassland BMP's	1,2,3,5,6	4,000 ac.			2000				2000	
Riparian Area Mgt. (RAM)	1,2,3,7	100 ac.			50				50	
Task 2: Livestock Nutrient Management										
Products 4: Ag Waste Systems										
Engineering Services	1,2,3,7	12	4			4		4		
System Installation	1,2,3,7	10			5	1			4	
Nutrient Management Plans	1,2,3,7	12				4		4	4	
Objective 2: Outreach										
Task 3: Information Campaign										
Product 5:										
Tours	1,2,3,4	2								
Informational Meetings	1,2,3,4	6								
Presentations	1,2,3,4	4								
Steering Committee Meetings	1,2,3,4	2								
News Releases	1,2,3,4	4								
Objective 3: Monitoring/Reports										
Task 4: Water Quality Monitoring										
Product 6: Water Samples/Testing		24		6	6			6	6	
Task 5: Reporting										
Product 7: Reports										
Semi-annual Reports	1,2,4	2		1				1		
Annual Reports	1,2,4	2				1			1	
Final Report	1,2,4									1

Lewis and Clark Watershed Implementation Project

Segment III

July 1, 2011 Through June 30, 2013

ITEM	Year 1 2011-12	Year 2 2012-13	Total	319-EPA	Consolidated WFC Fund	USDA EQIP/CRP	US F&W	SD GF&P	Local
Personnel Support									
Staff: Coordinator/Conservationist (2 FTE)									
Salary	$77,000	$77,000	$154,000	$154,000					
Payroll tax	$6,200	$6,200	$12,400	$12,400					
Health Insurance	$8,000	$8,000	$16,000	$16,000					
Workers Compensation	$1,000	$1,000	$2,000	$2,000					
Unemployment Insurance	$300	$300	$600	$600					
Retirement (3% of salary)	$2,400	$2,400	$4,800	$4,800					
Project Support Staff: Included Benefits	$6,000	$6,000	$12,000	$12,000					
Travel									
Lodging/meals/expenses	$1,200	$1,200	$2,400	$2,400					
Vehicle Lease (2)	$7,200	$7,200	$14,400	$14,400					
Fuel/Oil	$6,000	$6,000	$12,000	$12,000					
Repair/service	$600	$600	$1,200	$1,200					
Vehicle & general liability insurance	$2,500	$2,500	$5,000	$5,000					
Office Space/Equipment/Supplies:									
Office Supplies	$400	$400	$800	$800					
Postage	$100	$100	$200	$200					
Phone	$1,680	$1,680	$3,360	$3,360					
Office Space w/furniture (NRCS Contract)	$3,600	$3,600	$7,200	$7,200					
Computer System Connection (NRCS contract)	$6,000	$6,000	$12,000	$12,000					
Computer & Web Maintenance (NRCS contract)	$4,000	$4,000	$8,000	$8,000					
Administration:									
Project Management (Randall RC&D)	$3,000	$3,000	$6,000	$3,000					$3,000
319/Randall RC&D Audit, Liability & D &O insurance	$4,700	$4,750	$9,450	$9,450					
Compiled Financial Statement, liability and D&O ins.	$585	$585	$1,170	$1,170					
SDACD Contract (including audit)	$7,000	$7,000	$14,000	$14,000					
Subtotal: Personnel Support	**$149,465.00**	**$149,515.00**	**$298,980.00**	**$295,980.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$3,000.00**
Objective 1: BMP's Installation									
Task 1: Cropland/Grassland BMP installation									
Product 1: Cropland BMP's - 20,000 ac.	$37,500	$37,500	$75,000	$18,750		$37,500			$18,750
(Filter Strips, Grassed Waterways, Riparian plantings etc.)									
Product 2 : Grassland BMP's - 10,000 acres:	$97,250	$97,250	$194,500	$116,700		$16,250	$7,925	$5,000	$48,625
(Rotational grazing, fence, seeding, water development)									
Product 3: Riparian Area Mgt. (RAM Program) - 100 acres	$40,000	$50,000	$90,000	$67,500					$22,500
Task 2: Livestock Nutrient Management									
Product 4: 12 Ag Waste Systems									
Engineering Design Services - 12 @ $18,500 each	$148,000	$74,000	$222,000	$133,200	$33,300				$55,500
System Construction - 10 @ $150,000 each	$750,000	$750,000	$1,500,000	$312,500	$225,000	$587,500			$375,000
Winter Feeding Area - 2 @ $20,000		$40,000	$40,000	$24,000					$16,000
(water, fencing, tanks, windbreaks)									
Nutrient Management Plans - 12 @ $2500	$10,000	$20,000	$30,000	$22,500					$7,500
Subtotal: BMP Installation	**$1,082,750**	**$1,068,750**	**$2,151,500**	**$695,150**	**$258,300**	**$641,250**	**$7,925**	**$5,000**	**$543,875**
Objective 2: Outreach:									
Task 3: Information Campaign	$6,000	$6,000	$12,000	$4,000					$8,000
Product 5: (Informational meetings (2), tours (2),									
press releases (4), newsletters (4), steering com. (2)									
Subtotal: Outreach	**$6,000**	**$6,000**	**$12,000**	**$4,000**	**$0**	**$0**	**$0**	**$0**	**$8,000**
Objective 3: Monitoring and Project Management									
Task 4: Water Quality Sampling/Evaluations									
Product 6: 24 water samples/testing/evaluation @ $65/ea.	$780	$780	$1,560	$1,560					
Task 5: Reports And PIP Development:									
Product 7: Reports:(2- semi-annual, 2 - annual, & 1 - final)									
(Costs covered by project mgt. and personnel costs)									
Subtotal: Monitoring and Reports	**$780**	**$780**	**$1,560**	**$1,560**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Project Cost:	**$1,238,995**	**$1,225,045**	**$2,464,040**	**$996,690**	**$258,300**	**$641,250**	**$7,925**	**$5,000**	**$554,875**
Match:									
Ineligible Match - Federal and/or Project Allocated						$641,250.00	$7,925.00		
Eligible Match - Local and State					$258,300.00			$5,000.00	$554,875.00
Match: Project Totals For Match			$1,814,865	$996,690	$258,300			$5,000	$554,875
Match Percentages:			**100%**	**55%**	**14%**			**0%**	**31%**