Cannonball River/Dogtooth Creek Watershed
Project Implementation Plan

Grant County Soil Conservation District
103 Dakota Street
P.O. Box 259
Carson, ND 58529

Project Summary Sheet

Grant County Soil Conservation District Cannonball River/Dogtooth Creek Watershed Implement Project

SPONSOR: Grant County Soil Conservation District
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STATE: North Dakota
WATERSHEDS: Cannonball River, Dogtooth Creek
HYDROLOGIC UNIT CODE: 10130204, 10130206

TMDL Status; a TMDL has been developed for the areas being addressed

PROJECT TYPES
[ ] STAFFING/SUPPORT
[X] WATERSHED
[ ] GROUNDWATER
[ ] INOFRMATION/EDUCATION

WATERBODY TYPES
[ ] GROUNDWATER
[X] LAKES/RESERVOIRS
[X] RIVERS
[ ] STREAMS
[ ] WETLANDS
[ ] OTHER

NPS CATEGORY
[ ] AGRICULTURE
[ ] URBAN RUNOFF
[ ] SILVERCULTURE
[ ] CONSTRUCTION
[ ] RESOURCE EXTRACTION
[ ] STOWAGE/LAND DISPOSAL

PROJECT LOCATION: Grant County, North Dakota

MAJOR GOAL: The Grant County Cannonball River/Dogtooth Creek Watershed Project is designed to provide technical, financial, and educational assistance to agricultural producers and landowners within the two watersheds. The goal of this project is to improve water quality to enhance the recreational activities available on the Cannonball River and restore riparian habitat by implementing Best Management Practices (BMPs).

PROJECT DESCRIPTION: The project sponsors intend to prioritize technical and financial assistance to lands that have the most impact on water quality, track water quality trends over the life of the project, develop educational programs to heighten public awareness of nonpoint source pollution concerns and solutions and develop working partnerships in the local community to benefit natural resources.

FY 2014 319 Funds requested (base) $ 270,371
(incremental) $
Match $

Other Federal Funds $47,000.00
Total Project Cost $646,069.00
§319 Funded Full Time Personnel 1

2.0 Statement of Need

2.1 The Cannonball River/Dogtooth Creek TMDL Implementation Project targets approximately 44 miles of the Cannonball River which is fully supporting, but threatened due to excessive E-coli concentrations (exceeding 11,000 cfu/mL). Winter feeding on the Cannonball River and its tributaries and season long grazing are the most likely sources of the bacteria affecting the Cannonball River although failing septic systems or direct discharge sewage systems could also be contributing to the excessive E-coli concentrations.

The Grant County Soil Conservation District has long recognized the natural, economic, and recreational value of the Cannonball River and its surrounding watersheds with maintenance of the river's water quality and improved soil land management a high priority. The District recently completed the Cannonball River Watershed Project and considers it a huge success installing over $100,000 of Best Management Practices in the final year. The five year project, just upstream from this proposal, had practices installed that improved water quality on two of the three water sampling sites. The third site, on Highway 31, may see some improvement as many best management practices were installed in this area just last year. Water quality results for the Cannonball River Watershed Project are included in Appendix 1 indicating the water quality improvements made.

The district sees continued interest from producers in improving water quality on the Cannonball River. Word has circulated in the Cannonball River area that funding is available for water quality improvements and producers have seen what their neighbors or relatives have been able to accomplish through a watershed project. This proposal would continue the momentum of the past Cannonball Watershed project in improving water quality throughout all segments of the Cannonball River in Grant County.

2.2 The Cannonball River flows through five counties in southwest North Dakota, Originating in the northeast corner of Slope County, the Cannonball River winds its way in a southeasterly direction across Hettinger and Grant Counties where it confluences with Cedar Creek. At its confluence with Cedar Creek, the Cannonball River changes direction flowing northeast bisecting Sioux and Morton Counties and forming the northern border of the Standing Rock Indian Reservation. (See Appendix 2 for map) The North Dakota Department of Health has identified the Cannonball River as full supporting, but threatened for recreational use due to excessive E.coli bacteria concentrations.

This project will address water quality on stream segments ND-10030206-027-S-00 and ND-10130206-007-S_00 and their accompanying watersheds. These stream segments are physically located in or directly adjacent to Grant County. Since this project does cross county lines, the Grant County Soil Conservation District will work closely with the Cedar Soil Conservation District, using their district technician to initiate contact with producers in their district to ensure continuity in personnel. The technician will accompany the watershed coordinator with on site visits until a contract has been written assuring a seamless transition for the producer.

Most producers in Morton County affected by this project use the Grant County USDA office as their administrative office and have worked with personnel in the Grant County District, NRCS, and FSA offices. Any producer who is not affiliated with the Grant County office will have their plan reviewed by the Morton County Watershed Coordinator prior to funding.

Funding for this project will be controlled by Grant County Soil Conservation District.

2.3 The Cannonball River/Dogtooth Watershed Project is focusing on installing grazing type practices to improve water quality, targeting grazing land immediately adjacent to the Cannonball River or its tributaries. As indicated on the high priority crop and noncrop acres map in Appendix 2, noncrop acres (range and pastureland) make up a majority of the high priority areas.

Over 60 percent of the land in this proposal is either rangeland or grass land, therefore indicating that beef production is a high priority. Cropland fields, although prevalent, are small in acreage and on soils with a higher productivity index. With the rough terrain and fragile soils, proper land management is a necessity to prevent deterioration on all land uses.

Table # 1 Land Use Acreage by TMDL Sub-Watersheds.

Land Use Type	TMDL Sub-Watersheds				Total Acres	Total (%)
	ND-10130206-027-S_00		ND-10130206-007-S_00			
	Acres	Percent	Acres	Percent		
Pasture/Rangeland	84,187	56.6	117,224	41.7	201,411	46.85
Grassland	38,498	25.9	55,366	19.7	93,864	21.83
Alfalfa	615	0.4	556	0.2	1,171	0.27
Fallow/Idle Cropland/CRP	5,836	3.9	15,327	5.4	21,163	4.92
Small Grains (wheat, oats, & barley)	14,395	9.7	73,414	26.1	87,809	20.43
Row Crops (corn & sunflowers)	610	0.4	6,274	2.2	6,884	1.6
Other Crops	0	0	716	0.3	716	0.17
Wetlands/Water	2,228	1.5	4,100	1.4	6,328	1.48
Woods	818	0.6	1,328	0.5	2,146	0.5
Urban	1,118	0.8	6,283	2.2	7,401	1.7
Barren Ground	196	0.1	247	0.1	443	0.1
No Data	120	0.1	453	0.2	573	0.1
Total	**148,621**	**28.8**	**281,288**	**54.4**	**429,909**	**100**

The Cannonball/DogTooth Proposal has three small communities embedded in the watershed; Shields, Raleigh and Porcupine. Shields and Raleigh have less than 20 people in their communities with each homeowner having a private water and sewer system. The town of Porcupine has approximately 146 people with a municipal water and sewer system in place.

Much of the land in this proposal is privately owned either by active producers or absentee landowners. In Sioux County, approximately 70 percent of the land is either tribal or allocated land with the remaining 30 percent privately owned. Almost all the land in this watershed is being actively farmed or ranched with very little set aside for wildlife either through the Conservation Reserve Program or by private individuals. This area is seeing a slow influx of younger producers looking to take over the family farm or working alongside the family and acquiring additional acreage to support their operation.

2.4 The Cannonball River/Dogtooth Watershed Project focuses on the eastern end of the Cannonball River as it flows through Grant County and aims to promote riparian restoration by removing livestock pressure from the river and riparian areas. Many of the producers in this area use the river and its tributaries as their main source of water for their livestock throughout the calendar year.

This area has a strong emphasis on livestock production with most of the producers having more than 100 but less than 300 head of cattle. Sub-watershed ND-10130206-027-S_00 has ten known Animal Feeding Operations (AFOs) of 100 to 1000 and sub-watershed ND-10130206-007-S_00 has six AFOs of 100 to 1000 that are located in the riparian area or in a location where pollution from livestock waste is likely (Espe, 2005). There may be other AFOs in the TMDL sub-watersheds, however their location and size are unknown.

Failing septic systems or direct discharge sewage systems could be located within the watershed. Single-family dwellings and farmsteads are located throughout the watershed and while it has not been documented, land application of septic sludge may be another source of contamination. The district has chosen not to address septic systems as prior project history has shown water quality improvement achieved through grazing type water quality practices.

Season long grazing is more the norm due to a lack of infrastructure for a rotational grazing system (mainly wells and cross fences). Any crop production in this watershed is basically for feed; oats or barley for hay and corn for silage. Most of the land in this watershed is marginal for crop but with the advent of no till, the region is seeing some fields of corn for grain and sunflowers.

Rainfall in this watershed is minimal and this area is prone to drought conditions even during wet cycles. The soils are siltstone, sandstone and shale which minimize crop production and leave rangelands of short grass prairie, forbs and a wide variety of forage ideal for beef production. Due to the fragility of the soil, proper rangeland management is needed but not necessarily what is occurring in this watershed.

Livestock producers generally maintain their herds outside of the headquarters except for calving season. Herds are wintered in riparian areas using the river for water and river hills for protection. Backgrounding of calves is minimal and there is very little interest by producers in a contained animal feeding system.

There are about 40 producers in Grant County that would be affected by this watershed project with an additional estimated 25 total producers in Morton and Sioux County. Education and

information will be necessary as many of these producers have been ranching and farming for years, engrained with their routines.

2.5 Water quality issues as documented by the North Dakota Department of Health.

Below is a chart indicating the water quality problems on the Cannonball River during the years 2001 through 2007. As you can see, E.coli far exceeds the standard of 126 CFU/100 mL.

Station Number	Location Description	Number of Samples Collected / Years Collected	Max. (CFU/100 mL)	Min. (CFU/100 mL)	Geometric Mean (CFU/100 mL)	Percent Greater than 409 CFU/100 mL	Percent Samples Exceeding the 126 CFU/100 mL Standard
385138	Cannonball River, 1 miles S. and 0.5 miles E. of Shields, ND	38 / 2001-2002	11,000*	10	124	21	33
380067	Cannonball River, 0.5 miles S. of Breien on Hwy 6 bridge	60 / 1994-2007	3,400*	10	261	36	53
		44 / 2001-2002	1,600*	10	229	30	56

* Some of the samples returned results of "too numerous to count," a value of 1600 was used in these situations.

In summary, the Cannonball River/DogTooth Watershed Proposal desires to provide information, education and funding to producers in the southeastern portion of Grant County, north west areas of Sioux County and a small portion of Morton County. This project's goal is to continue improving water quality on the Cannonball River by installing grazing practices along the Cannonball River and its tributaries. With the success of prior Cannonball River projects, the District hopes this proposal will continue the momentum to improve water quality on all segments of the Cannonball River in Grant County.

3.0 Project Description

3.1 Goal

The goal of this project is to reduce E.coli bacteria in the Cannonball River to achieve "fully supporting" status to enhance the recreational use on the Cannonball River.

Objective 1:

By the end of the project period, the quality of water from stations 385138 and 380067 on the Cannonball River will meet the North Dakota E. coli bacteria standard of a geometric mean of 126 CFU/100 ml with less than 10 percent of samples exceeding 409/CFU/100 ml.

Task 1

Employ personnel needed to provide technical and administrative assistance to producers in the watershed area.

Planned Product: Employ a part-time watershed coordinator, an individual to take water samples, and an administrative assistant. Additional assistance will be provided by the District Technician employed with the Cedar Soil Conservation District.

Cost: $12,521.00 for the individual to take water samples.

Task 2

Provide assistance to producers to execute Best Management Practices (BMPs) that reduce E.coli loads in the watershed by improving grazing management. Priority will be giving to grazing practices that focus on improving the riparian areas of the Cannonball River and its tributaries.

Planned Product: Conservation planning on 5,000 acres in 2014, 7,500 acres in 2015, 15,000 acres in 2016, 17,500 acres in 2017 and 20,000 acres in 2018. Planning and practices will be a joint venture between watershed and NRCS at an estimated 75/25 split between the two entities.

Cost: $182,175

Task 3

Install partial manure management systems throughout the watershed. Priority will be given to those AFOs that consistently use the Cannonball River as a winter feeding area. Practices may include wells, pipelines, insulated water tanks and/or windbreak panels.

Planned Product: 10 partial manure management systems.

Cost: $61,500

Task 4

Promotion of cover crops to increase diversity in crop rotation and extend the grazing season with aftermath grazing, relieving pressure on range and pasture land.

Planned Product: Cover crop mixes planted on 100 acres of cropland in 2014, 100 acres in 2015, 150 acres in 2016, 200 acres in 2017 and 200 acres in 2016.

Cost: $14,175

Task 5

Conduct follow-up contacts to assist with conservation plan updates and monitor operation and maintenance of Section 319 cost shared products during the watershed project.

Planned Product: Database of applied BMPs with yearly status reviews throughout the watershed project.

Cost: Cost included with Task 1

Task 6

Coordinate with the entities involved in the EQIP locally led work group process to maximize the amount of EQIP funding available to improve water quality. This will include both technical and financial assistance needed to implement current and future projects on the Cannonball River to address water quality issues.

Planned Product: Target EQIP funding to improve riparian areas through grazing practices and improved land management through this project and in future years.

Cost: Cost included with Task 1

Objective 2

Increase the producers' understanding of the impacts and solutions to improve water quality.

Task 7

Organize and conduct scheduled information and educational programs focusing on grazing and land management within agricultural areas and coordinate them with ongoing state/federal sponsored information and education programs. Examples would be range, cover crop, soil health, and Grazing Land Coalition tours.

Planned Product: Four workshops, four tours/demonstrations and five informational meetings conducted throughout the project period.

Cost: $ 0 Cost will be incurred by district

Task 8
Prepare newsletter articles and direct mailings to local land users, general public and media to promote the project and disseminate information on improving water quality through better land management. Topics will include nutrient management, rotational grazing, benefits of cover crops, and other pertinent information on water quality.

Planned Product: Minimum of 15 newsletters and 10 direct mailings.

Cost: $ 0 Cost will be incurred by district

Task 9
Promote watershed activities and water quality practices at district sponsored events. Targeted audience would be all encompassing to include agricultural producers, urban and country dwellers and school aged children. Examples are Eco-Ed, Grant County Ag Day, County Producer meetings.

Planned Product: Minimum of 10 events throughout the watershed project.

Cost: $ 0 Cost will be incurred by district

3.2 See attached Milestone Table (Appendix 3)

3.3 All necessary permits will be acquired as needed. These may include Clean Water Act (CWA) Section 404 permits and cultural resource reviews through the State Historical Preservation office, when needed.

3.4 The Grant County Soil Conservation District (GCSCD) is the appropriate entity to coordinate and implement this project. The SCD is a locally elected volunteer conservation organization that serves all the people in the county. The GCSCD has legal authorization to employ personnel and receive and expend funds. The GCSCD has sponsored three other 319 projects.

3.5 The Grant County Soil Conservation District will be responsible for auditing Operations & Maintenance Agreements (O&M) on BMP's after completion of the project and yearly status reviews of EPA-319 contracts. The lifespan of each BMP will be listed in the individual contracts to ensure longevity of the practices. The producer signs the "EPA 319 Funding Agreement Provisions" form which explains in detail the consequences of destroying a BMP before the completion of its lifespan.

4.0 COORDINATION PLAN

4.1 This project is sponsored by the Grant County Soil Conservation District (GCSCD). Partners in the project will also include Natural Resources Conservation Service. The GCSCD will be the lead project sponsor.

Grant County Soil Conservation District – The lead project sponsor is the GCSCD. The ND State Health Department will hold a contracting agreement with the district to implement and complete the objective and tasks in this plan.

USDA Natural Resources Conservation Service (NRCS) – The NRCS will provide day to day assistance in conservation planning, plan writing, contract writing, and technical assistance for construction and installation of planned BMPs. NRCS personnel will conduct quality review and compliance checks of BMPs that are designed by NRCS personnel. Local NRCS personnel will provide approved BMP standards and specifications from the NRCS technical guide.

Environment Quality Incentive Program funds will also be available in limited amounts. NRCS will provide assistance by facilitating local involvement and participating in educational outreach programs during the project period. An annual review will be conducted with Field Office, DC, and the SCD to reconfirm and acknowledge NRCS's ability to commit to the project.

North Dakota Department of Health (NDDH) – The NDDH will oversee 319 funding as well as provide training for proper water quality sample collection, preservation, and transportation to ensure reliable data is obtained. The NDDH will provide the sponsor oversight to ensure proper management and expenditures of Section 319 funds. They will assist the Grant SCD personnel in review of O & M requirements for Section 319 funded BMP's.

North Dakota Cooperative Extension Service (EXT) – Fully supports this project and will complement project with education and informational activities which entails workshops and field tours. The specific role of EXT will be dependent on the type of information/education activity being implemented and availability of staff and materials.

Cedar Soil Conservation District – Full supports the project, technical assistance will be provided when necessary.

Grant County Commission – Fully supports the project and will be asked to provide assistance when necessary.

Grant County Water Resource Board (WRB) – Fully supports the project and will be asked to provide assistance when necessary.

North Dakota Game & Fish Department (NDG&F) – Fully supports the project and will be asked to provide assistance when necessary.

US Fish and Wildlife (USF&W) – Fully supports the project, programs and will be asked to provide assistance when necessary.

The Bureau of Reclamation- supports and fully endorses efforts to help conserve and protect our water resources.

4.2 Letters of support for this project are on file from adjoining Counties, Grant County Commissioners, Grant County Water Resource Board, ND Game & Fish, Bureau of Reclamation, and US Fish & Wildlife.

4.3 The Grant County Soil Conservation District will coordinate along with other 319 and non-319 funded NPS education programs, watershed projects, demonstration sites, and training programs being conducted by other organizations, which include the Department of Agriculture and ND Stockmen's Association.

4.4 The Cannonball River and Dogtooth Watershed Proposal focus is on best management practices that impact range and pasture lands. This proposal is unique to the area and is not duplicating any other project.

5.0 EVALUATION AND MONITORING PLAN

A Quality Assurance Project Plan (QAPP) will be developed by the North Dakota Health Department when this project is approved.

6.0 BUDGET

6.1 See Appendix 5.

7.0 PUBLIC INVOLVEMENT

7.1 Information and education meetings will be held to keep the community informed as needed. This may include community leaders, commissioners, water resource board members, city mayors, and district supervisors.

Appendix List

1. Upper Cannonball River Water Sampling Results
2. Grant County Maps and Photos
3. Milestone Table
4. Letters of Support
5. TMDL
6. Budget Tables

Appendix 1

Upper Cannonball River Water Sampling Results

This information is from recently completed Cannonball River Watershed Project. The results indicate that water quality was improved on two of the three monitoring sites through grazing type water quality practices from 2007 through 2012.

Station 385136

Station 385136 is located one mile east and 13 miles south of Carson, ND and monitors the immediate upstream 12 digit HUC 101302040702 . In total, 133 E. coli bacteria samples were collected and analyzed from 2007 through 2012.

Analysis of E. coli bacteria data collected at site 385136 in 2007 through 2012, demonstrated that the months of August and September were fully supporting the recreational beneficial uses while May and July were fully supporting, but threatened. The geometric mean and percent exceeded calculations for beneficial uses in the month of June were not supporting recreational uses. Though recreational beneficial uses are not supporting, data suggests that E. coli bacteria concentrations have declined since the beginning of the project (Figure 4). The annual geometric mean has declined from 178 CFU/100 mL in 2007 to 131 CFU/100 mL in 2012. It should also be noted that the percent exceeding 409 CFU/100 mL has declined from 32% in 2007 to 17% in 2012.

E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 385136

385136 - Cannonball River S of Carson, ND										
	May		June		July		August		September	
	5/1/2007	920	6/4/2007	220	7/10/2007	240	8/13/2007	600	9/5/2007	80
	5/8/2007	190	6/11/2007	230	7/16/2007	420	8/28/2007	110	9/11/2007	50
	5/15/2007	310	6/19/2007	340	7/23/2007	160	8/29/2007	20	9/17/2007	10
	5/22/2007	800	6/25/2007	950	7/25/2007	200	8/11/2008	190	9/26/2007	20
	5/30/2007	720	6/27/2007	590	7/31/2007	30	8/12/2008	350	9/1/2009	40
	5/5/2008	10	6/3/2008	210	7/6/2009	100	8/18/2008	100	9/8/2009	100
	5/6/2008	160	6/10/2008	20	7/13/2009	80	8/3/2009	80	9/14/2009	50
	5/13/2008	60	6/17/2008	100	7/21/2009	100	8/10/2009	140	9/21/2009	40
	5/19/2008	30	6/24/2008	590	7/22/2009	90	8/17/2009	40	9/30/2009	40
	5/28/2008	30	6/30/2008	390	7/29/2009	70	8/24/2009	170	9/1/2010	100
	5/1/2009	50	6/8/2009	160	7/6/2010	10	8/31/2009	10	9/7/2010	380
	5/4/2009	10	6/10/2009	30	7/12/2010	10	8/2/2010	40	9/13/2010	60
	5/11/2009	30	6/16/2009	110	7/20/2010	90	8/9/2010	60	9/15/2010	110
	5/18/2009	20	6/22/2009	140	7/26/2010	50	8/16/2010	30	9/27/2010	20
	5/27/2009	80	6/29/2009	20	7/27/2010	60	8/23/2010	110	9/6/2011	200
	5/3/2010	60	6/1/2010	200	7/6/2011	110	8/24/2010	100	9/12/2011	210
	5/10/2010	10	6/7/2010	60	7/11/2011	140	8/8/2011	260	9/19/2011	260
	5/18/2010	10	6/14/2010	80	7/18/2011	230	8/15/2011	110	9/26/2011	100
	5/24/2010	180	6/21/2010	100	7/25/2011	30	8/22/2011	200	9/28/2011	100
	5/26/2010	140	6/23/2010	3500	7/27/2011	80	8/30/2011	120	9/4/2012	50
	5/3/2011	10	6/8/2011	10	7/3/2012	720	8/7/2012	140	9/10/2012	80
	5/10/2011	30	6/13/2011	130	7/9/2012	110	8/13/2012	170	9/18/2012	50
	5/16/2011	30	6/20/2011	260	7/16/2012	110	8/20/2012	70	9/24/2012	60
	5/23/2011	890	6/22/2011	170	7/23/2012	410	8/27/2012	10		
	5/31/2011	90	6/27/2011	210	7/30/2012	100	8/29/2012	50		
	5/2/2012	50	6/6/2012	40						
	5/7/2012	190	6/13/2012	160						
	5/15/2012	200	6/19/2012	1600						
	5/22/2012	590	6/25/2012	250						
	5/29/2012	210	6/27/2012	300						
Number of Samples		30		30		25		25		23
Geometric Mean		81		166		96		87		69
Percent Exceeding 409		17%		17%		12%		4%		0%
Use Attainment	FST		NS		FST		FS		FS	
FS = Fully Supporting, FST = Fully Supporting, But Threatened, NS = Not Supporting										

Station 385137

Station 385137 is located four miles east and 13 miles south of Carson, ND and monitors the upstream 12 digit HUCs 101302040702 and 101302040703. In total, 133 E. coli bacteria samples were collected and analyzed from 2007 through 2012.

Analysis of E. coli bacteria data collected at site 385137 in 2007 through 2012 shows the site is fully supporting the recreational beneficial uses for all months except May, at which time the site had fully supporting, but threatened recreational uses. While all but one month is fully supporting recreational beneficial uses, data implies that E. coli bacteria concentrations still appear to be on a declining trend (Figure 6). The annual geometric mean has declined from 86 CFU/100 mL in 2007 to 65 CFU/100 mL in 2012. It should also be noted that the percent exceeding 409 CFU/100 mL has declined from 14% in 2007 to 4% in 2012.

E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 385137

385137 - Cannonball River S of Carson, ND										
	May		June		July		August		September	
	5/1/2007	20	6/4/2007	450	7/10/2007	80	8/3/2009	10	9/5/2007	120
	5/8/2007	20	6/11/2007	190	7/16/2007	140	8/10/2009	130	9/11/2007	10
	5/15/2007	130	6/19/2007	120	7/23/2007	180	8/17/2009	20	9/17/2007	10
	5/22/2007	800	6/25/2007	90	7/25/2007	90	8/24/2009	50	9/26/2007	30
	5/30/2007	800	6/27/2007	210	7/31/2007	40	8/31/2009	60	9/1/2009	220
	5/5/2008	10	6/3/2008	40	7/6/2009	50	8/2/2010	130	9/8/2009	100
	5/6/2008	40	6/10/2008	140	7/13/2009	50	8/9/2010	70	9/14/2009	140
	5/13/2008	60	6/17/2008	140	7/21/2009	50	8/16/2010	80	9/21/2009	60
	5/19/2008	10	6/24/2008	60	7/22/2009	50	8/23/2010	50	9/30/2009	10
	5/28/2008	30	6/30/2008	230	7/29/2009	20	8/24/2010	30	9/1/2010	250
	5/4/2009	10	6/1/2009	130	7/6/2010	100	8/24/2010	100	9/7/2010	330
	5/11/2009	20	6/8/2009	180	7/12/2010	160	8/8/2011	200	9/13/2010	110
	5/18/2009	20	6/10/2009	40	7/20/2010	50	8/15/2011	110	9/15/2010	70
	5/27/2009	100	6/16/2009	150	7/26/2010	130	8/22/2011	200	9/27/2010	30
	5/3/2010	80	6/22/2009	90	7/27/2010	60	8/30/2011	100	9/6/2011	100
	5/10/2010	40	6/29/2009	60	7/6/2011	10	8/7/2012	70	9/12/2011	170
	5/18/2010	60	6/1/2010	180	7/11/2011	140	8/13/2012	20	9/19/2011	130
	5/24/2010	520	6/7/2010	120	7/18/2011	80	8/20/2012	30	9/26/2011	200
	5/26/2010	11000	6/14/2010	50	7/25/2011	90	8/27/2012	10	9/28/2011	140
	5/3/2011	30	6/21/2010	200	7/27/2011	80	8/29/2012	20	9/4/2012	5
	5/10/2011	690	6/23/2010	250	7/3/2012	80			9/10/2012	5
	5/16/2011	20	6/8/2011	20	7/9/2012	120			9/18/2012	30
	5/23/2011	800	6/13/2011	200	7/16/2012	100			9/24/2012	20
	5/31/2011	270	6/20/2011	660	7/23/2012	100				
	5/2/2012	500	6/22/2011	130	7/30/2012	70				
	5/7/2012	170	6/27/2011	150						
	5/15/2012	230	6/6/2012	140						
	5/22/2012	310	6/13/2012	90						
	5/29/2012	360	6/19/2012	140						
			6/25/2012	100						
			6/27/2012	100						
Number of Samples	29		31		25		24		23	
Geometric Mean	103		124		72		53		55	
Percent Exceeding 409	24%		6%		0%		0%		0%	
Use Attainment	FST		FS		FS		FS		FS	
FS = Fully Supporting, FST = Fully Supporting, But Threatened, NS = Not Supporting										

Station 380105

Station 380105 is located 16 miles south of Raleigh, ND and monitors the entire Lower Cannonball River watershed including 12 digit HUCs 101302040702, 101302040703, 101302040704, and 101302040705 . In total, 142 E. coli bacteria samples were collected and analyzed from 2007 through 2012.

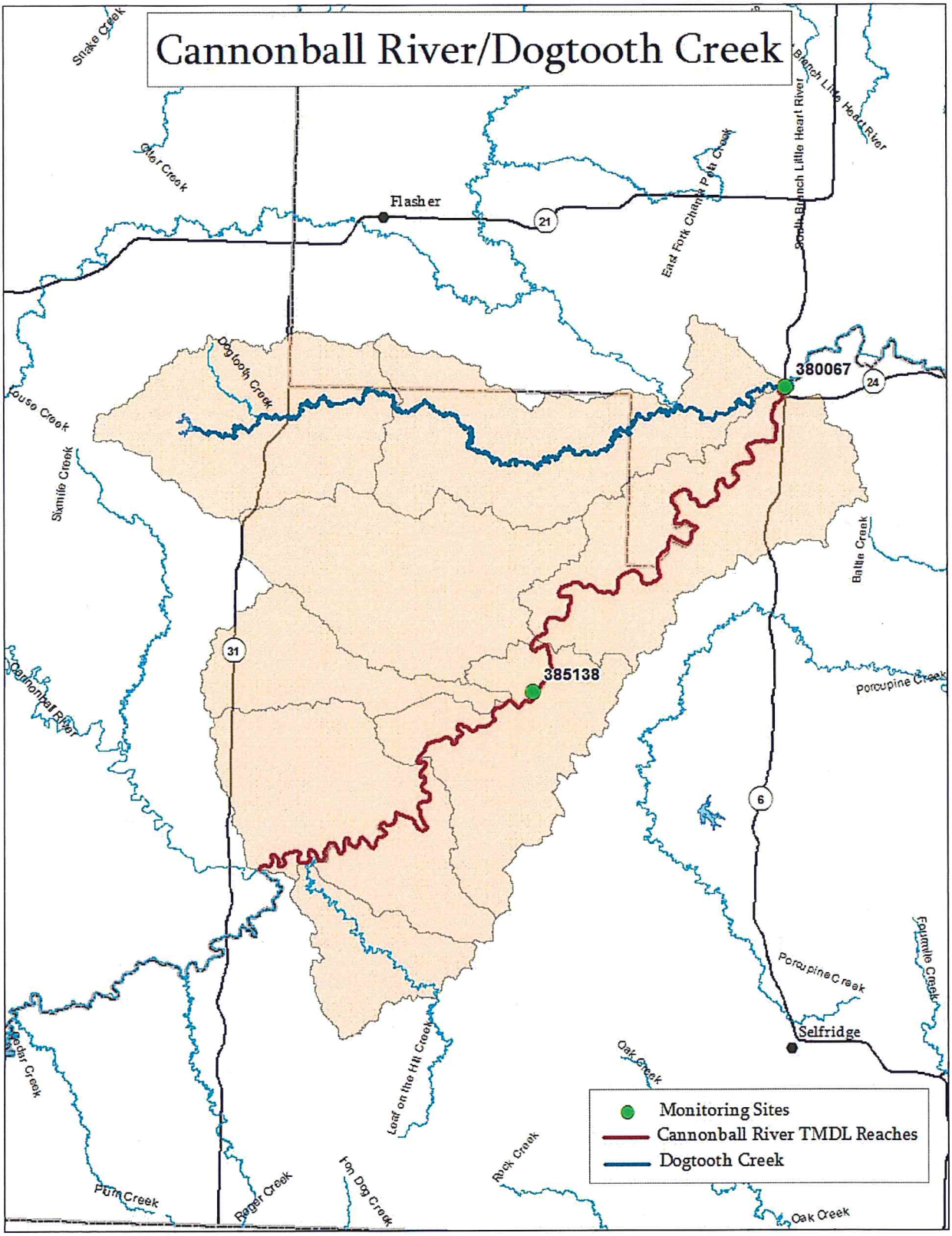
Analysis of E. coli bacteria data collected at site 380105 in 2007 through 2012 indicates the site was not supporting the recreational uses for all months except May when the recreational uses at the site were fully supporting, but threatened. Though recreational beneficial uses are not supporting, data suggests that E. coli bacteria concentrations have declined since the beginning of the project (Figure 8). The annual geometric mean has declined from 329 CFU/100 mL in 2007 to 126 CFU/100 mL in 2012. It should also be noted that the percent exceeding 409 CFU/100 mL has declined from 50% in 2007 to 17% in 2012.

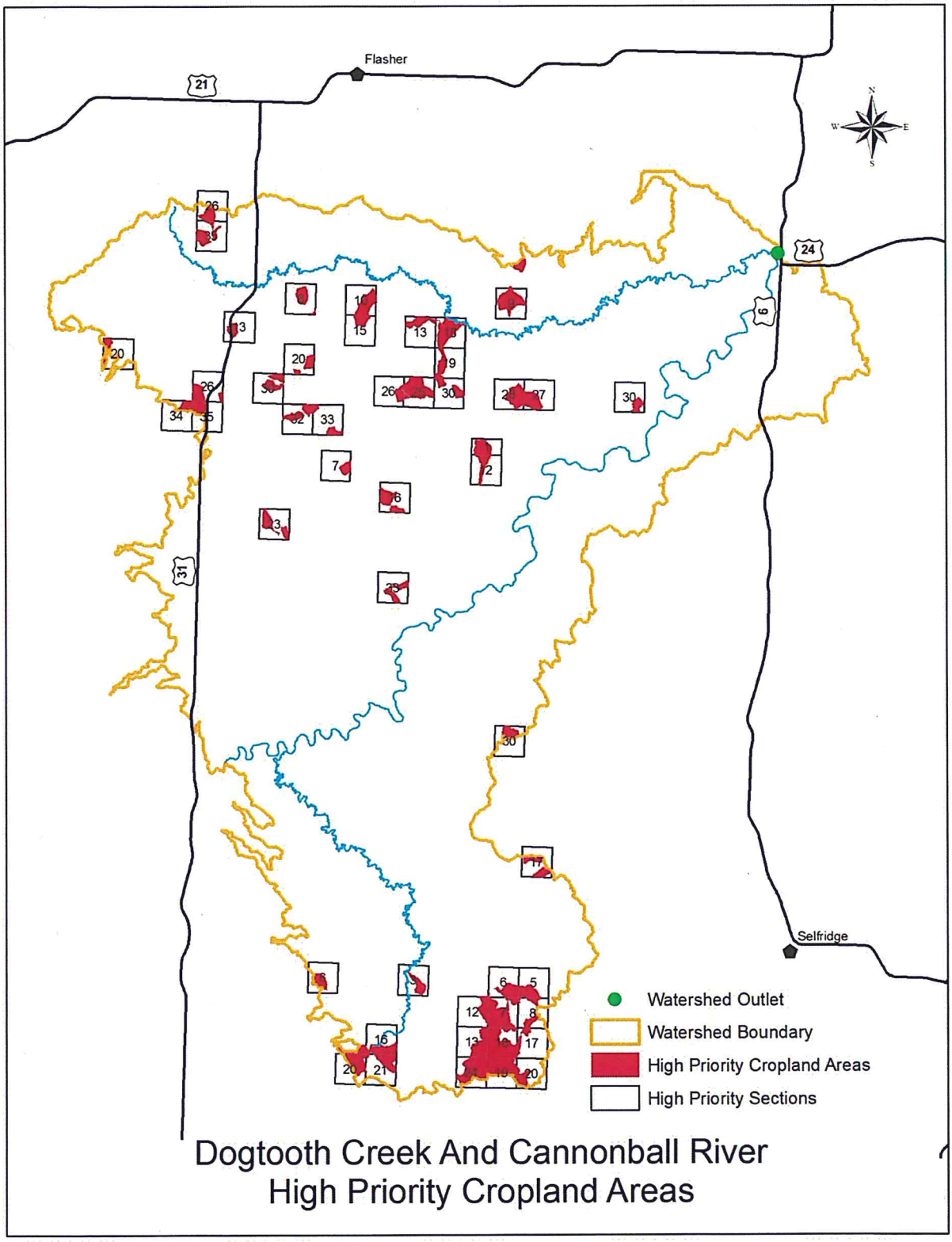
E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 380105

380105 - Cannonball River S of Raleigh										
	May		June		July		August		September	
	5/1/2007	70	6/4/2007	1400	7/10/2007	910	8/13/2007	2500	9/5/2007	160
	5/8/2007	60	6/11/2007	280	7/16/2007	530	8/14/2007	1000	9/11/2007	200
	5/15/2007	80	6/19/2007	400	7/23/2007	220	8/15/2007	600	9/17/2007	150
	5/22/2007	490	6/25/2007	770	7/25/2007	500	8/28/2007	2800	9/26/2007	40
	5/30/2007	800	6/27/2007	820	7/31/2007	50	8/29/2007	90	9/9/2008	12000
	5/6/2008	30	6/3/2008	180	7/21/2008	4400	8/5/2008	7000	9/16/2008	320
	5/13/2008	10	6/10/2008	380	7/28/2008	9000	8/11/2008	100	9/24/2008	13000
	5/19/2008	50	6/17/2008	800	7/6/2009	20	8/12/2008	70	9/29/2008	4000
	5/28/2008	300	6/24/2008	810	7/13/2009	400	8/18/2008	90	9/1/2009	50
	5/4/2009	10	6/30/2008	640	7/21/2009	10	8/3/2009	10	9/8/2009	30
	5/11/2009	10	6/1/2009	170	7/22/2009	40	8/10/2009	90	9/14/2009	80
	5/18/2009	30	6/8/2009	120	7/29/2009	40	8/17/2009	20	9/21/2009	80
	5/27/2009	30	6/10/2009	40	7/6/2010	250	8/24/2009	270	9/30/2009	20
	5/3/2010	10	6/16/2009	900	7/12/2010	210	8/31/2009	50	9/1/2010	9200
	5/10/2010	40	6/22/2009	110	7/20/2010	180	8/2/2010	180	9/7/2010	7200
	5/18/2010	40	6/29/2009	1300	7/26/2010	380	8/9/2010	60	9/13/2010	230
	5/24/2010	700	6/1/2010	190	7/27/2010	400	8/16/2010	190	9/15/2010	370
	5/26/2010	4500	6/7/2010	10	7/6/2011	1100	8/23/2010	50	9/27/2010	250
	5/3/2011	10	6/14/2010	40	7/11/2011	4300	8/24/2010	60	9/6/2011	100
	5/10/2011	140	6/21/2010	50	7/18/2011	70	8/8/2011	300	9/12/2011	230
	5/16/2011	40	6/23/2010	150	7/25/2011	110	8/15/2011	210	9/19/2011	100
	5/23/2011	800	6/8/2011	10	7/27/2011	100	8/22/2011	100	9/26/2011	140
	5/31/2011	90	6/13/2011	50	7/3/2012	360	8/30/2011	100	9/28/2011	150
	5/2/2012	60	6/20/2011	350	7/9/2012	60	8/6/2012	40	9/4/2012	110
	5/7/2012	450	6/22/2011	230	7/16/2012	180	8/7/2012	5	9/10/2012	80
	5/15/2012	110	6/27/2011	880	7/23/2012	240	8/13/2012	7200	9/18/2012	30
	5/22/2012	160	6/6/2012	130	7/30/2012	40	8/20/2012	100	9/24/2012	20
	5/29/2012	60	6/13/2012	8000			8/27/2012	10		
			6/19/2012	190			8/29/2012	70		
			6/25/2012	450						
			6/27/2012	200						
Number of Samples	28		31		27		29		27	
Geometric Mean	81		244		223		140		223	
Percent Exceeding 409	21%		35%		26%		21%		19%	
Use Attainment	FST		NS		NS		NS		NS	
FS = Fully Supporting, FST = Fully Supporting, But Threatened, NS = Not Supporting										

Appendix 2

Grant County Maps
And
Photos


Cannonball River/Dogtooth Creek
Snake Creek
Otter Creek
Flasher
21
East Fork Channel Pela Creek
South Branch Little Heart River
Branch Little Heart River
380067
24
Dogtooth Creek
Louse Creek
Sixmile Creek
Battle Creek
31
385138
Cannonball River
Porcupine Creek
6
Porcupine Creek
Fourmile Creek
Selfridge
Cedar Creek
Leaf on the Hill Creek
Oak Creek
Rock Creek
Plum Creek
Roger Creek
Fon Dog Creek
Oak Creek
Monitoring Sites
Cannonball River TMDL Reaches
Dogtooth Creek


Flasher
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24
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31
Selfridge
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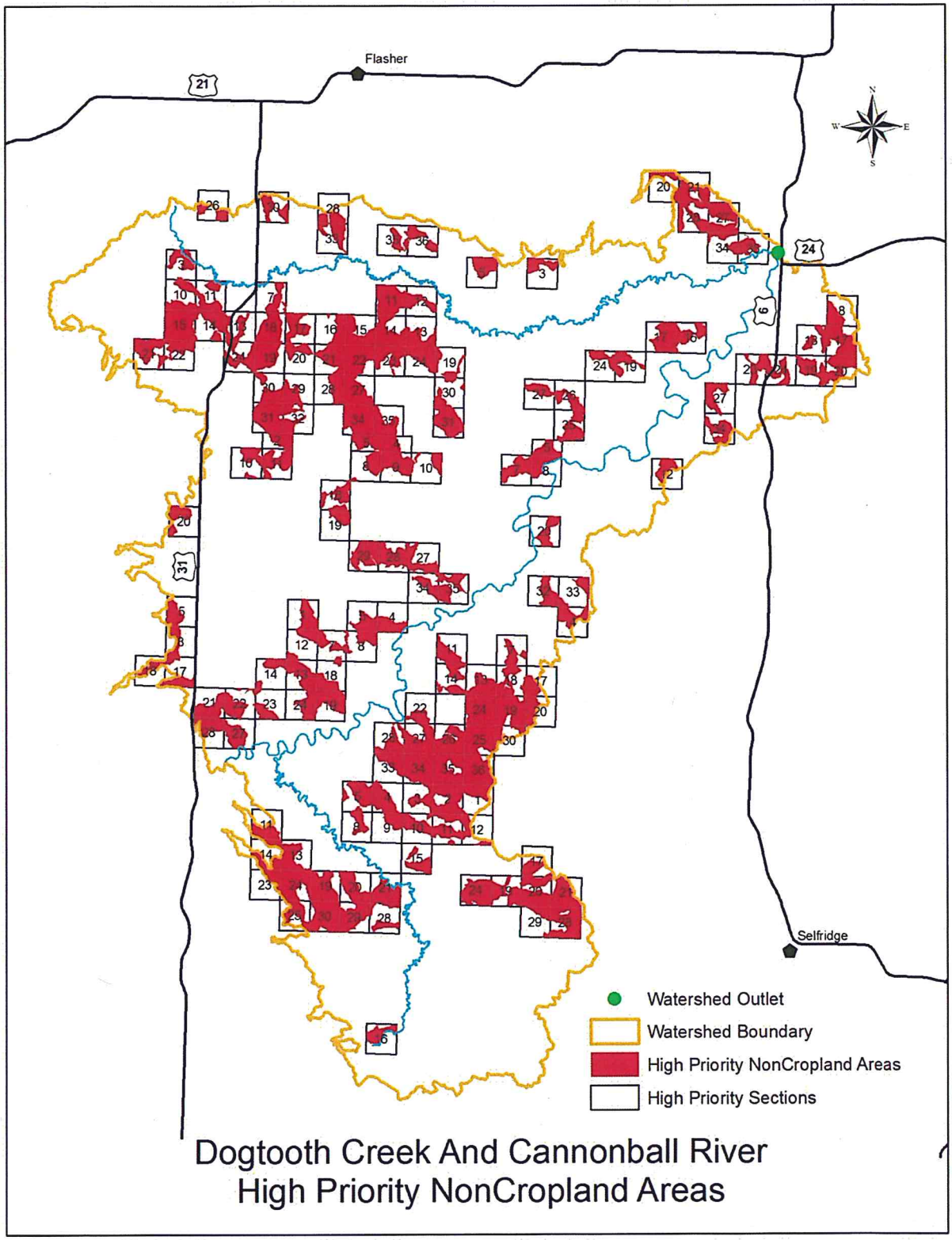
S
Watershed Outlet
Watershed Boundary
High Priority Cropland Areas
High Priority Sections
Dogtooth Creek And Cannonball River
High Priority Cropland Areas


Flasher
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Selfridge
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S
Watershed Outlet
Watershed Boundary
High Priority NonCropland Areas
High Priority Sections
Dogtooth Creek And Cannonball River
High Priority NonCropland Areas

Example of the terrain in the Cannonball Watershed

Fragile Soils in the Cannonball Watershed

Season Long Grazing

Grazing along a tributary of the Cannonball River

Another example of season long grazing

Grazing along the Cannonball River

Appendix 3

Milestone Table

Task	Output	Quantity	2014	2015	2016	2017	2018
Task 1 Employ personnel needed to provide technical and administrative assistance to producers in the watershed area.	Watershed Coordinator, Water Sampling Individual, Administrative Assistant, Cedar District Technician	4					
Task 2 Provide assistance to producers to execute BMPs that reduce sediment and nutrient loads on the approximately 400,000 acres of land in the watershed. This will be accomplished by installing such practices as fencing, tanks, and pipelines to implement a prescribed grazing system.	Conservation Planning	65,000 Acres	5,000 Acres	7,500 Acres	15,000 Acres	17,500 Acres	20,000 Acres
Task 3 Install partial manure management systems throughout the watershed. Priority will be given to those AFOs that consistently use the Cannonball River as a winter feeding area.	Partial Manure Management Systems	10					
Task 4 Promotion of cover crops to increase diversity in crop rotation and extend the grazing season with aftermath grazing, relieving pressure on range and pasture land.	Cover crops	750 acres	100 acres	100 acres	150 acres	200 acres	200 acres

Task 5 Conduct follow-up contacts to assist with conservation plan updates and monitor operation and maintenance of Section 319 cost shared products during the watershed project.	Database of applied BMPs with yearly status reviews throughout the watershed project.	1					
Task 6 Coordinate with the entities involved in the EQIP locally led work group process to maximize the amount of EQIP funding available to improve water quality.	Expertise and financial resources to producers in the project area installing grazing practices through EQIP	1					
Task 7 Organize and conduct scheduled information and educational programs focusing on grazing and land management within agricultural areas and coordinate them with ongoing state/federal sponsored information and education programs.	workshops tours/demonstrations informational meetings	13	1 tour 1 wrkshp 1 inform meeting	1 wrkshp 1 inform meeting	1 tour 1 wrkshp 1 inform meetings	1 wrkshp 1 inform meeting	1 tour 1 wrkshp 1 inform meeting
Task 8 Prepare newsletter articles and direct mailings to local land users, general public and media to promote the project and disseminate information on improving water quality through better land management.	newsletters direct mailings	25	3 news articles 2 direct mailings	3 news articles 2 direct mailings	3 news articles 2 direct mailings	3 news articles 2 direct mailings	3 news articles 2 direct mailings

Task 9 Promote watershed activities and water quality practices at district sponsored events. Targeted audience would be all encompassing to include agricultural producers, urban and country dwellers and school aged children.	District Sponsored Events	10					

Appendix 4

Letters of Support

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

August 19, 2013

Grant Co. Soil Conservation District – Board of Directors
PO Box 257
Carson, ND 58529

SUBJECT: Proposed Cannonball/Dogtooth Watershed Project Area – Support Letter

In theory, the department is supportive of funding non-point source pollution control measures through EPA-319 funding requested in 2013 by Grant & Sioux counties. The proposal includes an area encompassing a minimum of 12 PLOTS contracts totaling at least 8,000 acres of hunting access, not to mention potential for additional PLOTS program sign-ups.

Watering devices allow for managed grassland habitat increasing cover vigor and providing water quality benefits to both game and fisheries populations within and downstream of the project area. Grazing helps to reduce predominance of Kentucky bluegrass and smooth brome and benefits noxious weed control efforts by setting plant growth stage for control by other methods.

Sincerely,

Jon Roaldson
Private Lands Biologist
Telephone: (701) 328-6308

conserving
natural resources
for our future

Cedar Soil Conservation District

PO Box 47
21 North Main Street
Selfridge, ND 58568

Phone: 701-422-3332 #3
Fax: 701-422-3450
E-mail:
debbie.vollmuth@nd.nacdnet.net

Supervisors
Mitch Dix
Jeremy Maher
Kelly Froelich
Wayne "Biz" Hepper
Don Heinitz

Employees
Debbie Vollmuth
Robert Waliser
Kary "Moto" Utter

July 17, 2013

Grant County Soil Conservation District
PO Box 257
Carson, ND 58529

Re: Cannonball Watershed Project

The Cedar Soil Conservation District would like to extend their support to the Grant County Soil Conservation District watershed project along the Cannonball River. The Cedar Soil Conservation District feels this is a positive and worthwhile project that will help to improve the water quality in that area. Cedar SCD looks forward to working with Grant County SCD on this watershed project.

Kelly R Froelich

Kelly Froelich
Cedar SCD Chairman

All programs and services of the Cedar Soil Conservation District are offered on a non-discriminatory basis, without regard to race, color, national origin, religion, gender, age, marital status, or disability.

Grant County Water Resource District
PO Box 161, Elgin, ND 58533

July 15, 2013

Landowners and producers in the Cannonball and Dog Tooth Watersheds:

The Grant County Water Resource board supports the Grant County Soil Conservation in its investigation of pursuing sites along the Cannonball and Dog Tooth Watersheds to improve the water quality by moving cattle off the river/streams with pipelines and tanks and alternative watering systems, improve grazing systems with cross fences and converting marginal crop land to hay land or pasture.

In the past, success has been seen with this type of water management during major water runoff events.

The board supports the continued effort in managing major water runoff events. If you have any questions, please contact Harold Gaugler at (701) 376-5348 or email at hgaugler@sdplains.com.

Sincerely

Jerald Christensen

Jerald Christensen
Chairman

Jml

GRANT COUNTY
COMMISSION
PO BOX 227
CARSON ND 58529-0227

July 2, 2013

Grant County Soil Conservation District

PO Box 257

Carson, ND 58529

Re: Cannonball Watershed project

The Grant County Commission would like to extend their support to the Grant County Soil Conservation District watershed project along the Cannonball River. The Grant County Commission feels this is a positive and worthwhile project that will help to improve the water quality in that area.

Keith Rayne
Grant County Commission, Chairman

Office Hours: Mon-Fri 8:00 AM – 4:00 PM MST
Telephone (701)622-3275, (701)622-3422
Fax (701)622-3005

United States Department of the Interior
BUREAU OF RECLAMATION
Dakotas Area Office
P.O. Box 1017
Bismarck, North Dakota 58502

TAKE PRIDE® IN AMERICA

IN REPLY REFER TO:

DK-4100

AUG 13 2013

Board of Directors
Grant County Soil Conservation District
P.O. Box 257
Carson, ND 58529-0257

Subject: Letter of Support for a Segment of the Cannonball River Implementation Project

Dear Directors:

The letter is in response to and support of your proposed Cannonball River Implementation Project.

The Bureau of Reclamation supports the objectives of the Cannonball River Implementation Project sponsored by the Grant County Soil Conservation District, although we have no authority or funding to assist your effort. We fully endorse efforts such as this watershed project to help conserve and protect our water resources in North Dakota and to provide producers with viable economically, environmentally, and socially accepted resource solutions.

Sincerely,

Darrin Goetzfried
Supervisory Civil Engineer
Facilities and Engineering Division

RECEIVED AUG 14 2013

Appendix 5

TMDL

Can be found on NDDoH Website

www.ndhealth.gov/WQ

Appendix 6

Budget

CANNONBALL RIVER & DOGTOOTH CREEK IMPLEMENATION PROJECT
HIGHWAY 31 TO BREIEN
BUDGET TABLE

PART 2: Section 319 / Non-Federal Budget Funds	2014	2015	2016	2017	2018	TOTAL	FUNDING		
							Cash Costs	In-Kind Match*	319 Match
PERSONNEL SUPPORT & PLANNING ASSISTANCE (Tasks 1, 5, 6)									
1) Salary/Fringe - Watershed Coordinator (Grant) (part-time : 768 hrs./yr.)	$ 11,827	$ 11,827	$ 11,827	$ 11,827	$ 11,827	$ 59,136	$ 23,654	$ 35,482	$ -
2) Salary/Fringe - Watershed Coordinator (Sioux) (part-time : 120 hrs./yr.)	$ 158	$ 158	$ 158	$ 158	$ 158	$ 790	$ 316	$ 474	$ -
3) Salary/Fringe - Water Sampler (part-time : 240 hrs./yr.	$ 2,880	$ 2,880	$ 2,880	$ 2,880	$ 2,880	$ 14,400	$ 5,760	$ -	$ 8,640
4) Salary/Fringe - Admin. Assistant (part-time : 48 hrs./yr.)	$ 815	$ 815	$ 815	$ 815	$ 815	$ 4,075	$ 1,630	$ 2,445	$ -
5) Grant/Sioux Co. District Supervisors **(In-Kind)**12 meetings/yr./10 supervisors/extension agent	$ 990	$ 990	$ 990	$ 990	$ 990	$ 4,950		$ 4,950	
6) Travel for sampling (120 mi. per trip/per wk. x 23 wks. at $.36/mile)	$ 994	$ 994	$ 994	$ 994	$ 994	$ 4,968	$ 1,987	$ -	$ 2,981
7) Telephone/Postage (5 samples/mo.@$50/mo.)	$ 300	$ 300	$ 300	$ 300	$ 300	$ 1,500	$ 600	$ -	$ 900
Subtotals	*$ 17,964*	*$ 17,964*	*$ 17,964*	*$ 17,964*	*$ 17,964*	*$ 89,819*	*$ 33,948*	*$ 43,351*	*$ 12,521*
OBJECTIVES 1: Improve water quality from stations 385138 and 380067 on the Cannonball River to meet EPA criteria for fecl coliform and E. coli bacteria.									
8) Implement Grazing Plans and BMP Practices **(Task 2)**	$ 60,725	$ 60,725	$ 60,725	$ 60,725	$ 60,725	$ 303,625	$ 121,450	$ -	$ 182,175
9) Partial Manure Management System BMPs **(Task 3)**	$ 20,500	$ 20,500	$ 20,500	$ 20,500	$ 20,500	$ 102,500	$ 41,000	$ -	$ 61,500
10) Promotion of Cover Crops **(Task 4)**	$ 4,725	$ 4,725	$ 4,725	$ 4,725	$ 4,725	$ 23,625	$ 9,450	$ -	$ 14,175
11) Prescribed Grazing **(In-Kind)** 10,000 ac.	$ -	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 100,000		$ 100,000	
Subtotals	*$ 85,950*	*$ 110,950*	*$ 110,950*	*$ 110,950*	*$ 110,950*	*$ 529,750*	*$ 171,900*	*$ 100,000*	*$ 257,850*
OBJECTIVE 2: Increase producer understanding of the impacts and solution to improve water quality.									
12) Coordinate Information/Education Meetings focusing on grazing and land mangement/w other state/federal I/E programs. (4/workshops,4/tours,5/mtgs.) **Task 7**	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 15,000	$ 6,000	$ 9,000	$ -
13) Prepare newsletters and direct mailings. (15 newsletters, 20 direct mailings) **(Task 8)**	$ 300	$ 300	$ 300	$ 300	$ 300	$ 1,500	$ 600	$ 900	$ -
14) Promote watershed activities & practices at District sponsored events. (10 events) **(Task 9)**	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 10,000	$ 4,000	$ 6,000	$ -
Subtotals	*$ 5,300*	*$ 5,300*	*$ 5,300*	*$ 5,300*	*$ 5,300*	*$ 26,500*	*$ 10,600*	*$ 15,900*	*$ -*
TOTAL 319/NON-FEDERAL BUDGET	$ 109,214	$ 134,214	$ 134,214	$ 134,214	$ 134,214	$ 646,069	$ 216,448	$ 159,251	$ 270,371

CANNONBALL RIVER & DOGTOOTH CREEK IMPLEMENTATION PROJECT HIGHWAY 31 TO BREIEN BUDGET TABLE						
PART 1: FUNDING SOURCES	**2014**	**2015**	**2016**	**2017**	**2018**	**TOTAL**
EPA SECTION 319 FUNDS						
1) FY2014 319 Funds (FA)	54,074	54,074	54,074	54,074	54,074	270,371
Subtotals	***54,074***	***54,074***	***54,074***	***54,074***	***54,074***	***270,371***
OTHER FEDERAL FUNDS						
1) NRCS (TA)	3,000	3,000	3,000	3,000	3,000	15,000
2) NRCS EQIP (FA)	6,400	6,400	6,400	6,400	6,400	32,000
Subtotals	***9,400***	***9,400***	***9,400***	***9,400***	***9,400***	***47,000***
STATE/LOCAL MATCH						
1) Local SCDs (FA)	8,910	8,910	8,910	8,910	8,910	44,548
2) Local SCDs (TA)(In-Kind)	11,760	11,760	11,760	11,760	11,760	58,801
3) Cooperative Extension (TA)(Inkind)	90	90	90	90	90	450
6) Grant/Sioux County Participating Producers (TA)(In-Kind)	-	25,000	25,000	25,000	25,000	100,000
7) BMP (Producer match)	34,380	34,380	34,380	34,380	34,380	171,900
Subtotals	***55,140***	***80,140***	***80,140***	***80,140***	***80,140***	***375,699***
Total 319 & State/Local Match	**109,214**	**134,214**	**134,214**	**134,214**	**134,214**	**646,070**
TOTAL BUDGET including Federal Funds	**118,614**	**143,614**	**143,614**	**143,614**	**143,614**	**693,070**

FA = Financial Assistance
TA = Technical Assistance

FSA = Farm Services Agency
SCD = Soil Conservation District

NDDH = North Dakota Department of Health Dept.
NRCS = Natural Resources Conservation Service

CANNONBALL RIVER & DOGTOOTH CREEK IMPLEMENATION PROJECT
HIGHWAY 31 TO BREIEN
PART 3: Selected Best Management Practices (BMPs)

Land Use Code	319 Code	Practice	*Cost Per Unit*
1,2,3,	056	Alternative Power	$ *5,000.00*
1,2,3,	004	Solar Power	$ *5,000.00*
1,2,3,	382	Fencing	$ *1.35*
1	590	Nutrient Management	$ *5.00*
1,2,3,	516	Pipelines	$ *3.00*
3	528	Prescribe Grazing	$ *5.00*
2, 3	614	Trough & Tank	$ *1,200.00*
2, 3,	642	Well (livestock only)	$ *7,000.00*
1,2,3,	066	Windbreak Panels (portable)	$ *10,000.00*

Other eligible BMPs under the NPS Program may be applied and cost shared, when necessary.

Land Use Codes: 1 = Cropland 2 = Pasture Hayland 3 = Rangeland 4 = Farmstead/Misc