

# **Alternative Plan for Maple River/ Buffalo Creek Watershed in Cass County, North Dakota**

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**Prepared for:**

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**NORTH DAKOTA DEPARTMENT OF HEALTH  
Division of Water Quality**

**Introduction:** This is an alternative plan submitted for the Phase II of the Maple River Watershed Project in the Buffalo Creek Subwatershed. The North Dakota Department of Health, Watershed Management Program believes that since Best Management Practices (BMPs) have already been initiated through a Section 319 Nonpoint Source Program grant, the watershed is moving towards meeting water quality standards. Monitoring will be conducted as a part of the grant to determine the effectiveness of the BMPs and the project. If the BMPs implemented do not resolve the E.coli impairment in a reasonable amount of time, a TMDL will be written. The data gathered as a part of this 319 grant will be beneficial to the creation of the TMDL.

This document is a modified version of the Section 319 Project Implementation Plan. A crosswalk for how this document meets EPA's considerations for an alternative plan is included in Appendix E.

## 1.0 PROJECT SUMMARY SHEET

### LEAD PROJECT SPONSORS/SUBGRANTEES:

Address: Cass County Soil Conservation District  
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Fargo, ND 58103  
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Web: <http://www.casscd.org/>

STATE CONTACT PERSON: Greg Sandness TITLE: Environmental Scientist  
PHONE 701-328-5232 FAX 701-328-5200

STATE: North Dakota WATERSHED: Maple River  
HYDROLOGIC UNIT CODE: 09020205 HIGH PRIORITY WATERSHED: No

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
<input checked="" type="checkbox"/> STAFFING & SUPPORT	<input type="checkbox"/> GROUNDWATER	<input checked="" type="checkbox"/> AGRICULTURE
<input checked="" type="checkbox"/> WATERSHED RUNOFF	<input type="checkbox"/> LAKES/RESERVOIR	<input type="checkbox"/> URBAN
<input type="checkbox"/> GROUNDWATER	<input checked="" type="checkbox"/> RIVERS	<input type="checkbox"/> SILVICULTURE
<input checked="" type="checkbox"/> I & E CONSTRUCTION	<input checked="" type="checkbox"/> STREAMS	<input type="checkbox"/>
	<input type="checkbox"/> WETLANDS	<input type="checkbox"/> RESOURCE
	<input type="checkbox"/> OTHER	

EXTRACTION ☐ STORAGE/LAND DISPOSAL  
☐ HYDRO MODIFICATION  
☐ OTHER

PROJECT: LATITUDE 46 MIN. 45 LONGITUDE -97 MIN. 33

## Maple River Watershed Project – Phase II Buffalo Creek

### **GOAL FOR THE PROJECT:**

The goal of Phase II is to meet recreational use criteria for Buffalo Creek, a subwatershed of the Maple River. This will be done by reducing bacterial impairments so that E. coli will meet water quality standards. A secondary goal is to reduce nutrient loading to protect associated recreation and aquatic life uses.

### **PROJECT DESCRIPTION:**

The Cass County Soil Conservation District will use promotion and implementation of agricultural Best Management Practices (BMP's) to help meet the recreational use criteria of Buffalo Creek. As a sub watershed of the Maple River, this will also improve downstream designated uses. Phase II of the Maple River Watershed Project will implement comprehensive conservation planning, BMP implementation, monitoring and assessment, and information and education programs on the highest priority areas of the Buffalo Creek subwatershed. Since the nonpoint source sources that contribute bacteria also contribute nutrients (nitrogen, phosphorus, etc.) the BMPs put in place will create reductions in these pollutants as well, improving beneficial uses in the downstream portions of the Maple River as well.

The main objectives are:

- 1) Achieve reduction in E. coli bacterial levels in the Buffalo Creek Watershed through the implementation of BMPs
- 2) Document long term and short term water quality improvements (i.e. reductions in E. coli bacteria) in the Buffalo Creek Watershed
- 3) Increase public awareness on the impacts of and solutions to NPS pollution
- 4) Inform and educate local producers on land management practices to improve soil conditions and water quality
- 5) Conduct project administration, management, and support

**FY 2014 - 2018    319 Fund Requested    \$ 283,778    Match    \$189,186**

**Other Federal Funds    \$2,150,000    Total Project Cost    \$2,622,964**

## **2.0 Statement of Need**

### **2.1 Project Reference**

The Cass Co. Soil Conservation District (CCSCD) has long recognized the natural, economic, and recreational value of the many water bodies in the county, and will provide financial and technical assistance to develop, coordinate, and implement tasks to reduce the cumulative effects of these NPS pollutants. During Phase I of the Maple River Watershed Project, the CCSCD was able to assist landowners in addressing water quality concerns through the implementation of BMP's. These management practices included: septic system renovations, well decommissioning, field windbreaks, riparian forest buffers, critical area planting, and a variety of cropland BMP's. See Appendix C for Phase I BMP implementation numbers.

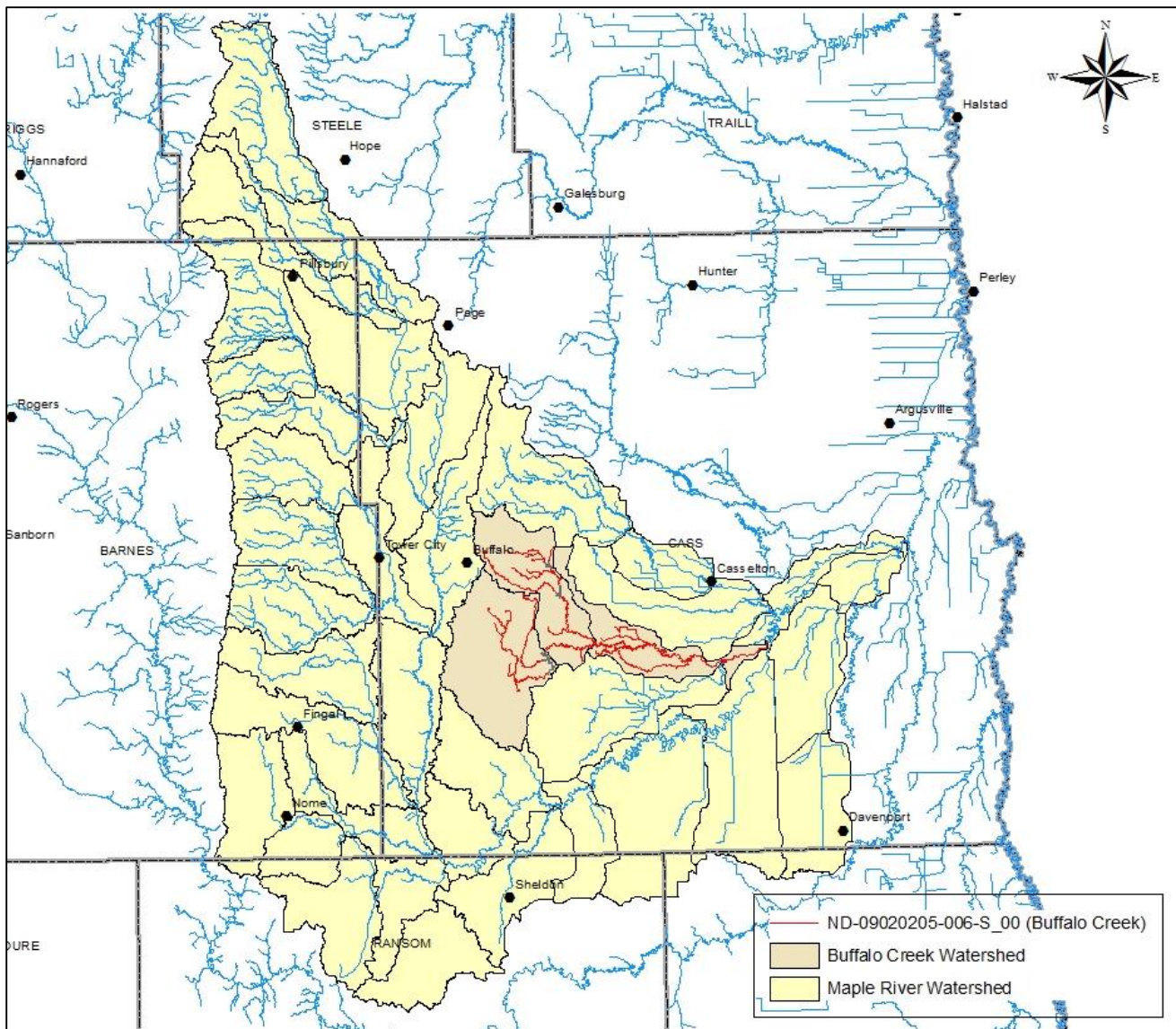
According to the 2014 Section 303(d) List of Impaired Waters Needing TMDLs, the North Dakota Department of Health has identified 6 reaches within the Maple River watershed as not supporting for fish and other aquatic biota due to fishes bioassessments and dissolved oxygen levels, and fully supporting but threatened for recreation beneficial use due to *Escherichia coli* (*E. coli*) bacteria. Based on current data, Buffalo Creek subwatershed would be not supporting recreation beneficial use due to *E. coli*.

In light of what is known about water quality impairments in the Maple River watershed, the CCSCD is proposing a Phase II Best Management Practice Implementation Project to address the water quality concerns evident in the Buffalo Creek subwatershed. The result of this project will be improvements in the quality of the water in Buffalo Creek as well as downstream Maple River, and progress toward the removal of this subwatershed from the North Dakota Section 303(d) list of impaired waters.

### **2.2 Watershed Description**

The Maple River watershed is a 1,008,912 acre watershed located in Cass, Barnes, Steele, Ransom, and Richland Counties in southeastern North Dakota. The Maple River watershed lies within the Level III Northern Glaciated Plains (46) and Lake Agassiz Plain (48) Ecoregions.

The Buffalo Creek, (Assessment Unit ID: ND-09020205-006-s\_00), which is a sub watershed of the Maple River Watershed, will be the primary focus of this Project (Figure 1). The Buffalo Creek Watershed is 82,000 acres in size and is listed in the 2014 Integrated Report as not supporting recreational uses due to *E. coli* bacteria impairment. Primary sources of *E. coli* bacteria in the watershed include small livestock feeding areas (i.e., 20-300 head); riparian pastures; and failed septic systems. Of the 14 livestock feeding operations, 5 are considered high priorities due to their close proximity to the creek and feeding area size. All the riparian pastures identified on the Agricultural Non-Point Source Pollution Model (AnnAGNPS) maps in Appendix A are considered high priority areas. While the AnnAGNPS model identifies nitrogen, phosphorus, and sediment loading in riparian areas, the same livestock that contribute these pollutants also contribute *E. coli* bacteria along the same pathway (i.e. overland runoff ) so the maps are considered useful in identifying areas to target. With livestock grazing, the areas that contribute large amounts of nutrients and sediment are also going to contribute large amounts of bacteria as well.



**Figure 1. Buffalo Creek (ND-09020205-006-S\_00), Subwatershed of Maple River.**

Approximately 20 farmsteads or ranchettes are also located along the creek. Of these farmsteads, past experience suggests, as much as 75% of the farmsteads may have failed septic systems (*Note: On-site verification will be completed to confirm the actual status of the potential septic system failures*). Information provided by the NDDoH NDPDES personnel indicates no point sources discharging into Buffalo Creek.

To meet water quality standards for *E. coli* bacteria and fully support the recreational uses of Buffalo Creek, the Project will need to address grazing management on all the AnnAGNPS priority pastures; improve management on the five priority feeding operations, and repair about 15 failed septic systems along the creek.

## **2.3 Maps**

Maps of the watershed and sampling site location are included in Appendix A. Also included in Appendix A is a map of the grazing/pasture priority areas for BMP implementation.

An Annualized Agricultural NonPoint Source Pollution (AnnAGNPS) model was developed for the Buffalo Creek priority sub watershed. The AnnAGNPS model uses soils data/evaluation, fertilization rates, cropping systems, elevation, land use, precipitation data, etc. to 1) characterize the size and shape of the watershed; 2) estimate nitrogen (N), phosphorus (P) and sediment yields per cell in the watershed; and 3) identify “high priority areas” that are potentially the most significant sources of nutrients (N and P) and sediment in the Buffalo Creek watershed. This information will be used in conjunction with known livestock feeding areas to identify highest priority areas for BMPs. As mentioned above, the areas identified with the potentially significant sources of nutrients and sediment will also be the most significant sources of bacteria in areas known for livestock grazing (e.g. riparian areas, pastures, etc.).

When prioritizing the cells delineated by AnnAGNPS, all the cells in the watershed were ranked from highest to lowest with respect to nitrogen, phosphorus and sediment yield, with the first cell nearest the y-axis of the graph having the highest yield. There were over 5900 cells delineated in the Buffalo Creek watershed, with an average size of 22 acres. To identify the high priority cells, a straight/best fit line was visually placed over the flattest portion of the ranked plot values. The point on the line at which the cell yield values begin to significantly deviate from the “best fit” line was used as a starting point for defining the yield values for the high priority cells. To establish a reasonable workload for the project period and size, the total number of high priority cells initially identified was adjusted further to establish the final list of high priority cells shown on the AnnAGNPS priority maps in Appendix A. Google Earth and observations were used to identify the priority animal feeding operations in the watershed as well as the potential number of failed septic systems. The AnnAGNPS priority maps for non-cropland will also be used to provide direction for delivering assistance for riparian grazing management. These priority cells will be focused on in order to coordinate with producers and evaluate needs, and to implement BMP’s that reduce/prevent the delivery of nutrients and/or E. coli bacteria to Buffalo Creek.

The high priority AnnAGNPS cells associated with livestock will be targeted for technical and financial assistance to implement BMP’s. If the project enters into another phase, the AnnAGNPS model will be re-run to establish new high priority areas.

## **2.4 General Watershed Information**

The Maple River watershed is 1,008,912 acres in size. The topography and elevation within Cass County is predominately flat. The climate is semi-arid with an average of 21” of precipitation annually, with a majority (14.3”) falling during the growing season of May through September. The monthly average high temperatures range from a max of 83<sup>0</sup> F in July to a low of 17<sup>0</sup> F in January. Monthly lows range from -3<sup>0</sup> F in January to 57<sup>0</sup> F in July. The annual average temperature is 41<sup>0</sup> F.

The Maple River watershed is divided into two main geologic units. The eastern portion of the watershed encompasses the glacial Lake Agassiz offshore sediments and river sediments, while the extreme western portion of the watershed is glacial till material. Buffalo Creek subwatershed lies

primarily in the eastern portion. The soils of the Buffalo Creek subwatershed are strongly influenced by the geology of the region. Most of the area of the subwatershed is described as level and nearly level fine textured soils that formed on glacial lacustrine sediment and on glacial lake plains in the UDSA Soil Survey General Soil Map of 1983. Common soils include the Fargo and Bearden series, which are deep, poorly drained and slowly permeable soils. The natural drainage pattern of these soils is poorly defined.

Primary land use throughout the subwatershed is intensive row crop agriculture. Corn, beans (soy & dry edible), sunflowers, wheat, and sugarbeets are the primary crops produced. In 2012, 46% of the acres planted in Cass County were soybeans, 35% of the acres were planted to corn, while 9% was planted to wheat. Sugar beets, dry edible beans, sunflowers, and barley each constituted about 1% each of the total acres.

Livestock plays a moderate roll in the agriculture of the subwatershed. There are approximately 17,000 head of cattle throughout Cass County, or 1% of all production in North Dakota. Livestock producers in this area are generally small animal feeding operations (AFO) with less than 300 cattle. However, those that do produce livestock are more likely to live near the river or a tributary to the river where the land is less tillable or frequently flooded; therefore it is used as pasture for the animals.

## **2.5 Water Quality**

With intensive agricultural practices dominating the majority of the land use throughout Cass County, agricultural runoff is a major contributor to nonpoint source pollution in the Maple River Watershed, including the Buffalo Creek subwatershed. Understanding bacteria data helps us identify the extent of E. coli impairments and the threats to recreational uses throughout the watershed.

### **Pathogens**

Excessive amounts of fecal bacteria in surface waters used for recreation have been known to indicate an increased risk of pathogen-induced illness to humans. Infections due to pathogen contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat, and skin disease (EPA, 1986). The fecal bacteria known to cause the most harm to humans is E. coli bacteria and is the parameter used in NDDoH water quality standards. A summary of E. coli bacteria data is shown in Table 1. A map of monitoring site 385354 can be found in Appendix A.

**Table 1. Summary of E. coli Data for site 385354 (Buffalo Creek)**

385354										
	May		June		July		August		September	
	5/18/2011	50	6/1/2011	800	7/5/2011	120	8/2/2011	180	9/6/2011	680
	5/25/2011	140	6/7/2011	70	7/13/2011	200	8/9/2011	720	9/13/2011	1100
	5/1/2012	30	6/14/2011	180	7/20/2011	210	8/17/2011	170	9/19/2011	420
	5/8/2012	170	6/20/2011	130	7/26/2011	180	8/23/2011	600	9/27/2011	620
	5/14/2012	140	6/28/2011	140			8/30/2011	3800		
	5/7/2013	10	6/5/2012	40						
	5/7/2013	20	6/20/2012	220						
	5/14/2013	90	6/4/2013	120						
	5/22/2013	40								
	5/29/2013	70								
Geomean	55		145		174		550		664	
% Exceeded 409 CFU/100 mL	0%		13%		0%		60%		100%	
Recreational Use Support	Fully Supporting		Not Supporting		Not Supporting		Not Supporting		Not Supporting	

Analysis of E. coli data collected at site 385354 in 2011, 2012, and 2013 indicated that only the month of May was fully supporting recreational use. Water quality data for the months of July, August and September were not available in 2012 and 2013 as the creek had no flow during those months in those years.

### Recreational Use Support Assessment Methodology

Recreation use is any activity that relies on water for sport and enjoyment. Recreation use includes primary contact activities such as swimming and wading and secondary contact activities such as boating, fishing, and bathing. The status of recreation use in rivers and streams is considered “fully supporting” when there is little or no risk of illness through either primary or secondary contact with the water. The State’s recreation use support assessment methodology for rivers and streams is based on the State’s numeric water quality standards for E. coli bacteria.

For each assessment based solely on E. coli data, the following criteria are used:

- Assessment Criteria 1: For each assessment unit, the geometric mean of samples collected during any month from May 1 through September 30 does not exceed a density of 126 colony forming units (CFUs) per 100 milliliters (mL). A minimum of five monthly samples are required to compute the geometric mean. If necessary, samples may be pooled by month across years.
- Assessment Criteria 2: For each assessment unit, less than 10 percent of samples collected during any month from May 1 through September 30 may exceed a density of 409 CFUs per 100 mL. A minimum of five monthly samples is required to compute the percent of samples exceeding the criteria. If necessary, samples may be pooled by month across years.

The two criteria are then applied using the following use support decision criteria:

- Fully Supporting: Both criteria 1 and 2 are met



- Fully Supporting but Threatened: Criteria 1 is met while 2 is not met
- Not Supporting: Criterion 1 is not met. Criteria 2 may or may not be met

Based on the data, recreational use assessment for Buffalo Creek is not supporting recreational use due to E. coli bacteria impairment.

### Sources of Pollution

Typical sources of pollution within the Buffalo Creek subwatershed can be linked to agricultural runoff. Overland flows contribute significant fertilizer and pesticide runoff causing nutrient impairments. Animal feeding operations and riparian grazing are also a contributor to nutrient impairments and E. Coli bacteria. Land use within the watershed consists of extensively tilled landscapes and expansive cropland acres that leave the land exposed and susceptible to wind and water erosion and contribute to sedimentation in waterways.

Within the Buffalo Creek subwatershed, failing septic systems and livestock contribute to E. Coli bacteria impairments. Addressing failed septic systems and reducing pathogen input from high priority pasture and riparian areas determined in a land use assessment and through AnnAGNPS priority mapping is critical. Information provided by the NDDoH NDPDES personnel indicate there are no permitted point sources in within the Buffalo Creek subwatershed. Funds will be targeted to reduce E. coli bacteria inputs through the implementation of BMP's. Tables 2 through 5 indicate how BMPs will help reduce bacteria.

**Table 2. Nonpoint Sources of Pollution and Their Potential to Pollute at a Given Flow Regime.**

Nonpoint Sources	Flows		
	High Flow	Medium Flow	Low Flow
Riparian Area Grazing (Livestock)	H	H	H
Animal Feeding Operations	H	M	L
Manure Application to Crop and Range Land	H	M	L
Intensive Upland Grazing (Livestock)	H	M	L
Note: Potential importance of nonpoint source area to contribute fecal coliform bacteria loads under a given flow regime. (H: High; M: Medium; L: Low)			

**Table 3. Management Practices and Flow Regimes Affected by Implementation of BMPs**

Management Practice	Flow Regime and Expected Reduction		
	High Flow/ 70% Reduction	Moderate Flow/ 80% Reduction	Low Flow/ 74% Reduction
Livestock Exclusion From Riparian Area	X	X	X
Water Well and Tank Development	X	X	X
Prescribed Grazing	X	X	X
Waste Management System	X	X	
Vegetative Filter Strip		X	
Septic System Repair		X	X

**Table 4. Bacterial Water Quality Responses to Four Grazing Strategies (Tiedemann et al., 1988)**

Grazing Strategy		Geometric Mean CFU
Strategy A:	Ungrazed	40/L
Strategy B:	Grazing without management for livestock distribution; 20.3 ac/AUM.	150/L
Strategy C:	Grazing with management for livestock distribution: fencing and water developments; 19.0 ac/AUM	90/L
Strategy D:	Intensive grazing management, including practices to attain uniform livestock distribution and improve forage production with cultural practices such as seeding, fertilizing, and forest thinning; 6.9 ac/AUM	950/L

**Table 5. Relative Gross Effectiveness of Confined Livestock Control Measures (Pennsylvania State University, 1992a)**

Practice <sup>b</sup> Category	Runoff <sup>c</sup> Volume	Total <sup>d</sup> Phosphorus (%)	Total <sup>d</sup> Nitrogen (%)	Sediment (%)	Fecal Bacteria (%)
Animal Waste System <sup>e</sup>	-	90	80	60	85
Diversion System <sup>f</sup>	-	70	45	NA	NA
Filter Strips <sup>g</sup>	-	85	NA	60	55
Terrace System	-	85	55	80	NA
Containment Structures <sup>h</sup>	-	60	65	70	90

NA = Not Available

a Actual effectiveness depends on site-specific conditions. Values are not cumulative between practice categories.

b Each category includes several specific types of practices.

c - = reduction; + = increase; 0 = no change in surface runoff.

d Total phosphorus includes total and dissolved phosphorus; total nitrogen includes organic-N, ammonia-N, and nitrate-N

e Includes methods for collecting, storing, and disposing of runoff and process-generated wastewater.

f Specific practices include diversion of uncontaminated water from confinement facilities.

g Includes all practices that reduce contaminant losses using vegetative control measures.

h Includes such practices as waste storage ponds, waste storage structures, and waste treatment lagoons.

## **BMP Implementation Status Update, September 2017**

BMP implementation is well underway with 1,198 acres planted to cover crops, 10 pasture/grazing management projects completed and another 5 in development and 1,500 acres of livestock exclusion along riparian areas created. Also, two riparian restoration demonstration sites are being developed and will include 7,400 feet of trees and willows. Three septic systems have been renovated with another two in development. Work is intensifying to get information out to landowners on available cost share. Annual reports identifying all achievements to date can be found on EPA's Grant Reporting and Tracking System (GRTS) website at <https://ofmpub.epa.gov/apex/grts/f?p=109:987:::NO>

## **3.0 Project Description**

### **3.1 Goals for the Project**

During the course of the project, Cass County Soil Conservation District (SCD) will aim to restore recreational use within the Buffalo Creek subwatershed through the implementation of Best Management Practices (BMP's) targeted to reduce E. coli bacteria. As a secondary goal, the SCD will use education and promotion of water quality management and BMP implementation to improve land management and water quality in the Buffalo Creek subwatershed.

### **3.2 Objectives & Tasks**

Objective 1: Provide local project administration and staffing to deliver technical assistance to landowners in the watershed and coordinate with conservation programs available through other state, federal, local and non-governmental organizations.

Task 1: Employ one full-time Watershed Coordinator for 5 years.

Product: Project coordinator to manage day-to-day project activities; provide technical assistance to landowners/producers; organize and conduct I&E events; and coordinate with NRCS Field office staff, Extension Service and other resource management entities to promote and install BMP.

Cost: \$187,200 (\$112,320 319 funds; \$74,880 SCD match)

Task 2: Manage Section 319 funds and local match and oversee all aspects of project implementation to ensure all tasks are completed as scheduled.

Product: Monthly review of project activities and progress; annual evaluations of staff performance; ongoing project promotion; assist with outreach efforts; approve BMP cost share agreements; coordinate with project partners; provide support staff; and secure necessary matching funds.

Costs: SCD In-kind match

Objective 2: Reduce E. coli bacteria levels to meet state standards of recreational use impairments in the Buffalo Creek subwatershed. State standard criteria for E. coli bacteria during the recreational season are a geometric mean of 126 CFU/100 ml with less than 10% of samples exceeding 409 CFU/100 ml. To achieve the recreational standard, the current monthly geometric mean concentrations during the recreational season will need to be reduced by 15% - 80%, with less than 10% of the monthly samples exceeding 409 CFU/100ml. The highest concentration reductions are needed in August and September, which are likely associated with riparian grazing and inputs from failed septic systems.

Task 3: Identify and repair 15 failed septic systems located within the Buffalo Creek subwatershed. Emphasis will be placed on addressing the failed systems located within close proximity to Buffalo Creek and its tributaries.

Product: Replace or repair 15 failed septic systems contributing to elevated E. coli levels.

Cost: \$90,000 (\$54,000 319 funds; \$36,000 producer match)

Task 4: Focusing on Buffalo Creek subwatershed, minimize the length of time livestock are fed in confined areas or riparian areas by assisting producers to implement management systems that utilize fences, water developments, windbreaks, winter grazing management plans, cover crops and/or crop residues to better distribute feeding/grazing locations, and move livestock away from riparian areas and confined feeding sites.

Product: 10 grazing management plans, 2,000 acres of cover crop, 5 miles of field windbreaks, and 1,500 acres of grazing exclusion along impaired riparian zones.

Cost: \$85,864 ( \$51,518 319 funds; \$39,396 producer match)

Objective 3: Achieve reduction of nutrients (N and P) and sediment through the implementation of BMP's. This objective will focus on reducing nutrient runoff through the use of reduced tillage, cover crops, field buffers, and riparian buffers, to protect current aquatic life beneficial uses and recreation uses relating to nutrients.

Task 5: Improve water infiltration and reduce surface runoff through the use of residue management, reduced tillage, and cover crops.

Product: 1,500 acres of cover crop

Cost: \$30,000 (\$18,000 319 funds; \$12,000 producer match)

Task 6: Establish 4 demonstration sites that show cost effective practices that can be used to restore the vegetation within degraded riparian areas.

Product: 4 demonstration sites showing riparian restoration through tree planting, grass seeding; management changes and/or the installation of buffers.

Cost: \$9,750 (\$5,850 319 funds \$3,900 producer match)

Task 7: Coordinate with the FSA and NRCS to enroll CRP acres and establish vegetative buffers along the riparian corridor of the Buffalo Creek.

Product: 500 acres of CRP; 50 acres of buffers

Cost: USDA program funding

Objective 4: Monitor the effectiveness of BMP's implementation through water quality sampling as BMP's are installed.

Task 8: Collect samples, as outlined in the QAPP, to document changes in water quality trends as BMP are installed.

Product: See section 5.0, Evaluation and Monitoring Plan & QAPP.

Cost: \$5,000 (\$3,000 319 funding; \$2,000 local match)

Objective 5: Increase public awareness on the priority NPS pollution issues in Cass County and the feasible solutions to those issues.

Task 9: Design and facilitate no till demonstration site to promote the use of zero tillage, diverse crop rotations, and cover crop. The demonstration site will provide visual evidence to the benefits of using these management practices on the farm. Benefits of using these practices include: reduced wind and water erosion on the landscape, reduced nutrient runoff, improved soil health, diversified monocultures, reduced fertilizer and nutrient inputs.

Product: One no till demonstration site 80 acres in size to demonstrate no till farming, diverse crop rotation, and the use of cover crops

Cost: \$ 35,000 (Cost based on \$75/acre land rental for the demo site)

Task 10: Conduct annual educational events at the no till demonstration site to allow area producers to see and learn about the practices that were used on the site to reduce NPS pollution concerns. When possible, these events will be coordinated with ongoing state and/or federal I/E programs in the area.

Product: 1 Farm tour/year, 5 Educational workshops, and 2 BMP demos.

Cost: \$5,000 (\$3,000 319 funds; \$2,000 local match; sources of in kind match will be used where applicable)

Task 11: Prepare brochures, quarterly newsletter articles, and direct mailings, to local land users and the general public to promote the project and disseminate information on water quality and NPS pollution management.

Product: 5 Quarterly newsletters, one brochure, 2 direct mailings

Cost: \$1,250 (\$750 319 funds; \$500 SCD Match)

### **3.3 PROJECT MILESTONES:**

See Milestone Table, Appendix B.

### **3.4 PERMITS:**

All necessary permits will be acquired. These may include CWA Section 404 permits and NDPDES permits. The State Historic Preservation Officer will be consulted regarding potential cultural resource affects.

### **3.5 LEAD PROJECT SPONSOR:**

Cass County Soil Conservation District (CCSCD) and the Maple River Water Resource Board (MRWRB) are sponsoring this water quality project with CCSCD as the lead sponsor. The CCSCD's annual and long range plans will help to prioritize and guide the field service staff. The CCSCD has legal authorization to employ personnel and receive/expend funds. They have a track record for personnel management and addressing conservation issues for the constituency. The MRWRB is responsible for the management of water resources in the Buffalo Creek subwatershed, and will provide technical support for the project.

### **3.6 BMP OPERATION AND MAINTENANCE:**

Project staff will ensure that any Section 319 funded BMPs are properly installed and operated throughout the BMP lifespan. Cropland BMPs such as cover crops, nutrient management, and pasture/hayland plantings will be monitored every year of their lifespan. Any structural BMPs will be evaluated the first year and spot-checked thereafter. A signed O&M agreement will accompany any structural BMPs requiring engineering assistance (in the design packet). These agreements will outline proper operation and maintenance for the landowner to follow. Practices implemented with lifespans longer than the project's lifespan will be the responsibility of the NDDoH. In some cases, such as livestock containment facilities, permits from the NDDoH will enforce the O&M of the system throughout its life. If a producer abandons or destroys a BMP before the end of its lifespan, the producer will be required to pay back all Section 319 funds given previously for the installation of the BMP (Appendix D)

## **4.0 COORDINATION PLAN**

**4.1** This project sponsors are Cass County Soil Conservation District (CCSCD) and Cass County Water Resource Boards. Major partners include Ransom County SCD, Cass County Commissioners, Natural Resources Conservation Service, ND County Extension Service, and the Lake Agassiz Resource Conservation & Development Council. The CCSCD will be the lead project sponsor.

1. Cass County Soil Conservation District (CCSCD) – The lead project sponsor is the CCSCD. The ND Department Health (NDDoH) will hold a contract with the district. Land use assessment, BMP implementation (demonstration sites), project administration, computer entry, landowner contacts, water sampling, and water quality education will be the responsibility of the district.
2. Ransom County SCD and Barnes County SCD have both expressed support for the project. Ransom County will be providing assistance with livestock waste management system planning in cooperation with their current 319 watershed project in the Sheyenne River watershed.
3. 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 BMP. NRCS personnel will conduct quality review and compliance checks of BMP that are designed by NRCS personnel. Local NRCS personnel will provide approved BMP standards and specifications from the NRCS technical guide. Conservation planning assistance will be provided to the Resource Management System (RMS) level. 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 ASTC (FO), DC, and the SCD to reconfirm and acknowledge NRCS's ability to commit to the project).
4. North Dakota Department of Health – The NDDoH 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 NDDoH will provide the sponsor oversight to ensure proper management and expenditures of Section 319 funds. They will assist NRCS and the Cass SCD personnel in review of O & M requirements for Section 319 funded BMP.
5. North Dakota State Extension Service (EXT) – To complement the project's information and education activities, local and state Extension personnel may be available to contribute in-kind assistance when needed. This will entail workshops and field tours. The specific role of Extension will be dependent on the type of information/education activity being implemented and availability of staff and materials.
6. Maple River Water Resource Board (WRB) – Maple River Water Resource Board will be involved in the project by acting as advisors. Maple River WRB will contribute Technical assistance for the project and also promote the project in Cass County.

7. North Dakota Game&Fish Department (NDG&F) – NDG&F will be asked to provide technical assistance to the project when needed.
8. Farm Services Agency (FSA) – Programs available through FSA will be pursued for cost share assistance.
9. US Fish and Wildlife (USF&W) – Programs and technical assistance available through USF&W will be pursued for project assistance.

**4.2** Members of the Cass SCD board, some of whom live in the watershed, express their support for this project, in addition to other government and private entities that have a stake in the watershed. Letters of support are on file at the Cass SCD office from: NRCS, Farm Service Agency, ND G&F, Red River Basin Commission, NDSU Ext., Maple River WRB, Ransom Co. SCD, Lake Agassiz RC&D and US F&W.

**4.3** The Maple River Watershed Phase II Project will be working closely to coordinate activities with the NRCS, NDG&F Department, and the Maple River Water Resource Board

The Watershed Coordinators for each district will keep communication open while in between the projects. As a general guideline, projects that are located within Barnes County will be coordinated by the BCSCD Watershed Coordinator.

**4.4** The Maple River Water Resource District is currently drawing up plans for a channel drainage improvement in the Buffalo Creek sub watershed of the Maple River. This project, if approved, could potentially alter the hydrology and ecology of the watershed. Alternative plans are being developed that would address non-point source sediment issues associated with drainage improvement. The Cass SCD, through the 319 watershed coordinator, will remain involved in the process and provide any technical assistance necessary as it relates to addressing non-point source pollution issues associated with the project. There are currently no other similar non-point source pollution projects being undertaken in the watershed. Past and current projects, most of which are associated with USDA programs, which have previously occurred or do occur, are planned as a part of county-wide efforts to address conservation issues in the area.

## **5.0 EVALUATION AND MONITORING PLAN**

The project sponsors coordinated with the NDDoH to develop the Quality Assurance Project Plan (QAPP). The QAPP describes the monitoring goals and objectives as well as the data collection needs for evaluating progress toward the targeted E. coli bacteria concentrations. Data will be collected throughout the project period to provide annual updates on concentration trends and an overall assessment of concentration reductions achieved by the end of the project. A final water quality report describing progress toward established targets is included in the final project report developed at the end of the project.



Annual progress reports focused on the accomplishments associated with each of the tasks listed in Section 3.0 will also be used to gauge progress toward land improvement and public education goals. The annual reports are provided to the ND NPS Program and entered in the GRTS in December of each year. These annual reports and monthly interactions with project staff are used to determine if the degree of progress warrants continuation of current funding; adjustment of project focus; and/or discontinuation of the project.

For this phase (Phase II) of the project, the primary focus is on E. coli bacteria sources, with nutrient source reduction as a secondary goal. The annual and final reports, in combination with available water quality data, will be used in the final year (2018) of the project to describe progress toward these goals. Based on these reports, the project goals will be revisited and may be adjusted to account for progress in BMP implementation as well as any changes in 303(d) listing status, use attainment; and/or pollutant sources. This end-of-project review will aid the project sponsors and their partners in determining if the project is progressing as planned and should be continued or if a TMDL is needed to better direct future efforts to restore the recreational uses (or another use) of the creek. If the water quality standards for E. coli are not met within a reasonable period of time after the implementation project is complete, a TMDL will be developed to address the E. coli impairment in Timber Coulee. Data collected throughout the project will be beneficial to the development of the TMDL.

## **6.0 BUDGET**

### **6.1 See Appendix B.**

## **7.0 PUBLIC INVOLVEMENT**

### **7.1 Information and education meetings will be held to keep the community informed. Community leaders, commissioners, water resource board members, and district supervisors will be involved in decision-making processes involving the implementation of Phase II of the Maple River Watershed Project.**

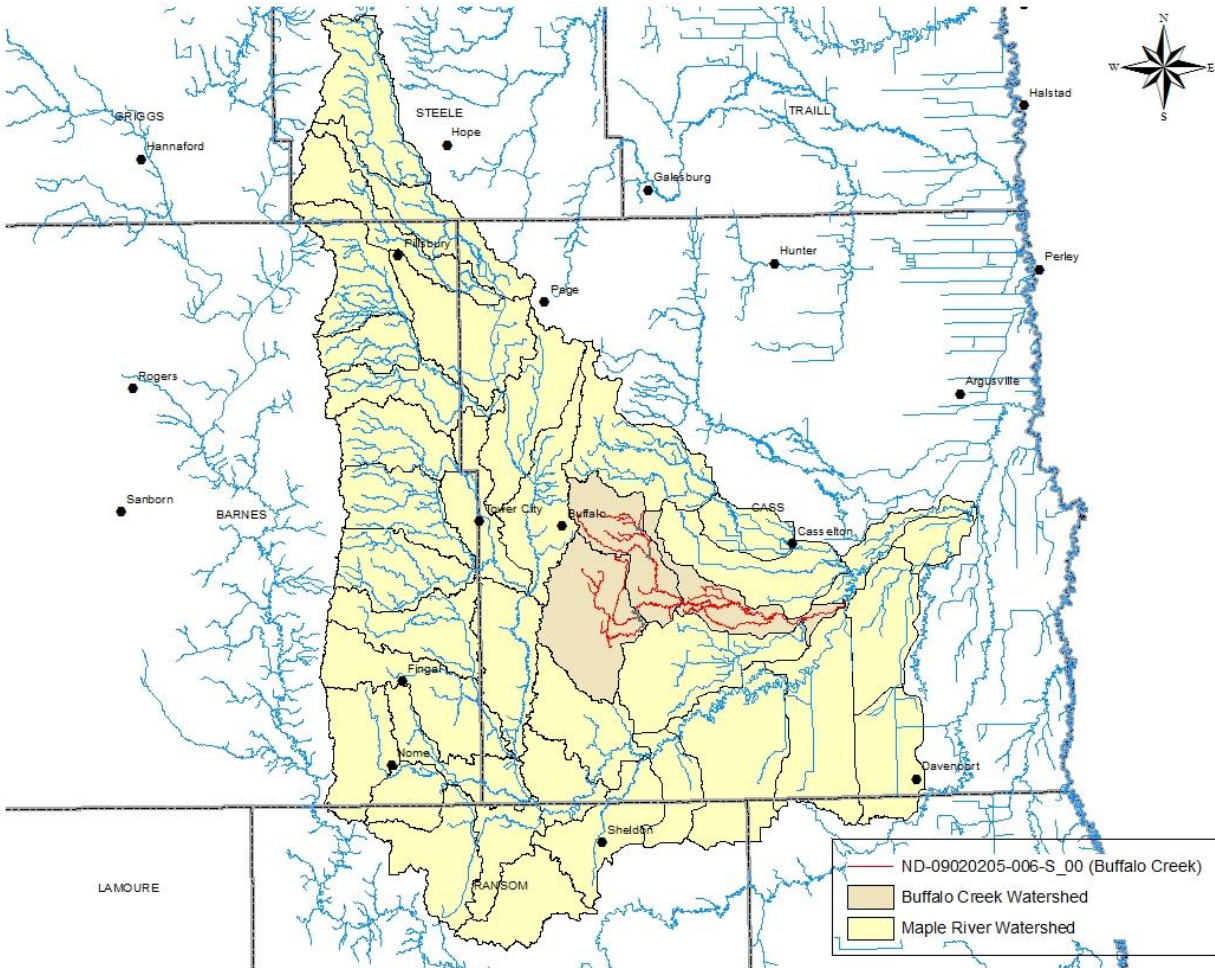
## **Appendix A**

### **Maps**

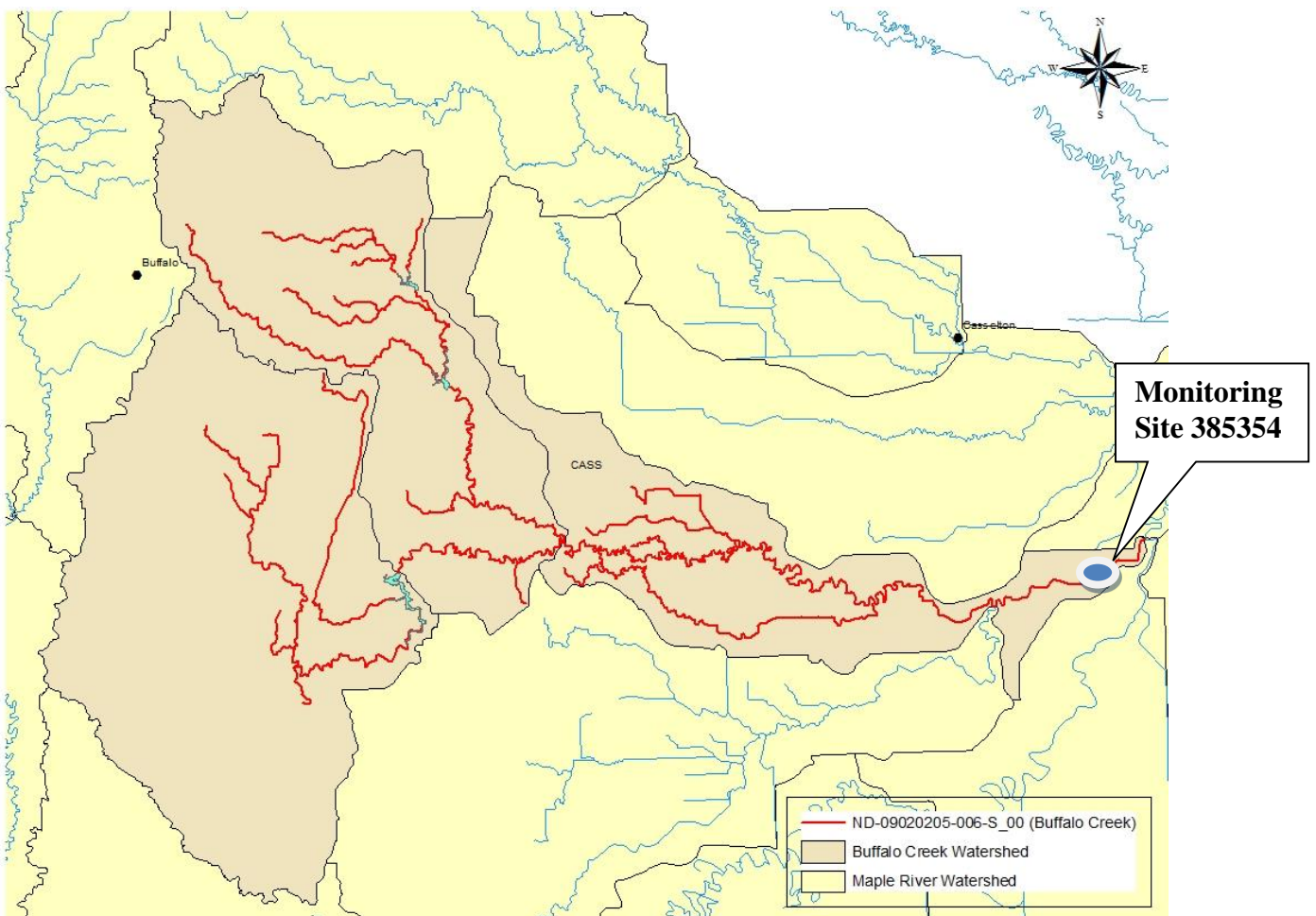
# Map 1 Location in North Dakota



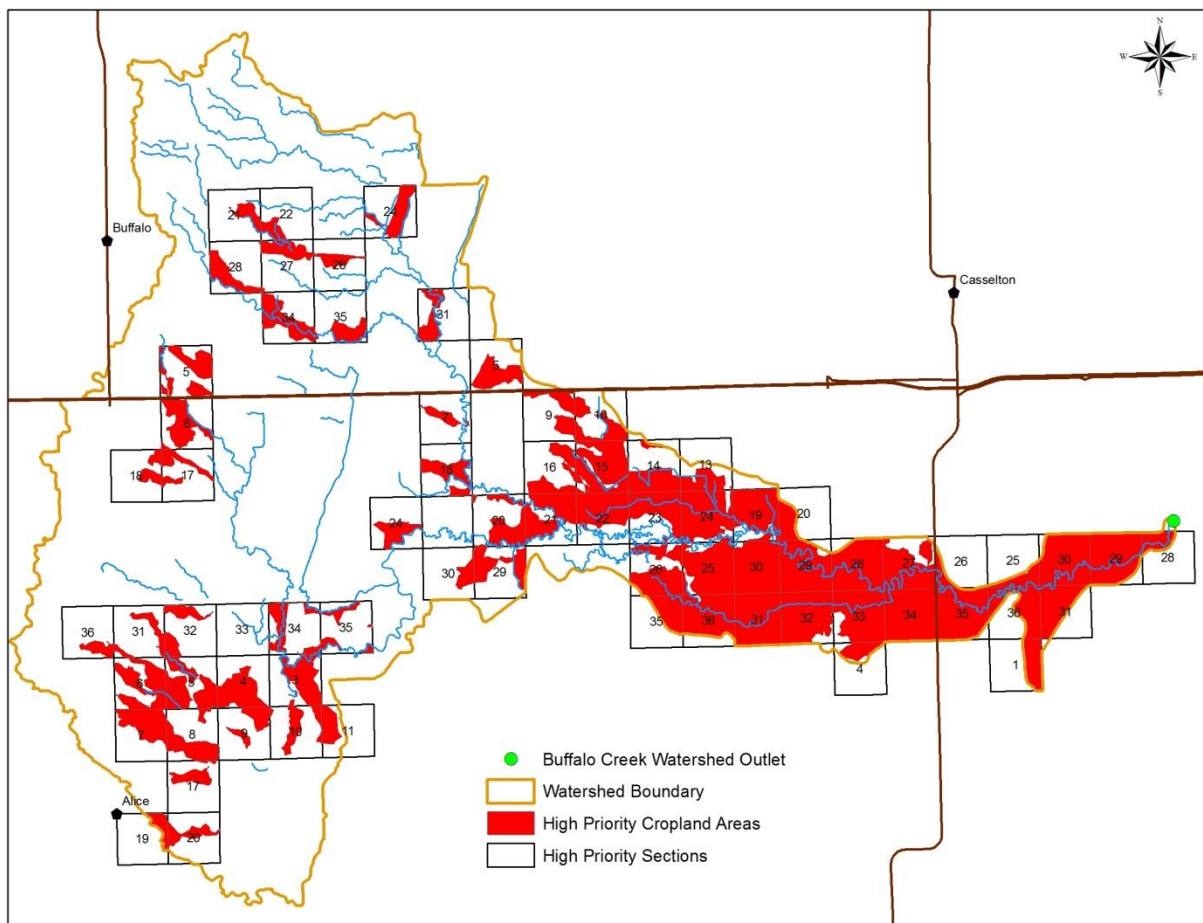
**Map 2**  
**Location of Buffalo Creek Subwatershed within Maple River Watershed**



**Map 3**  
**Location of Buffalo Creek Monitoring Site**

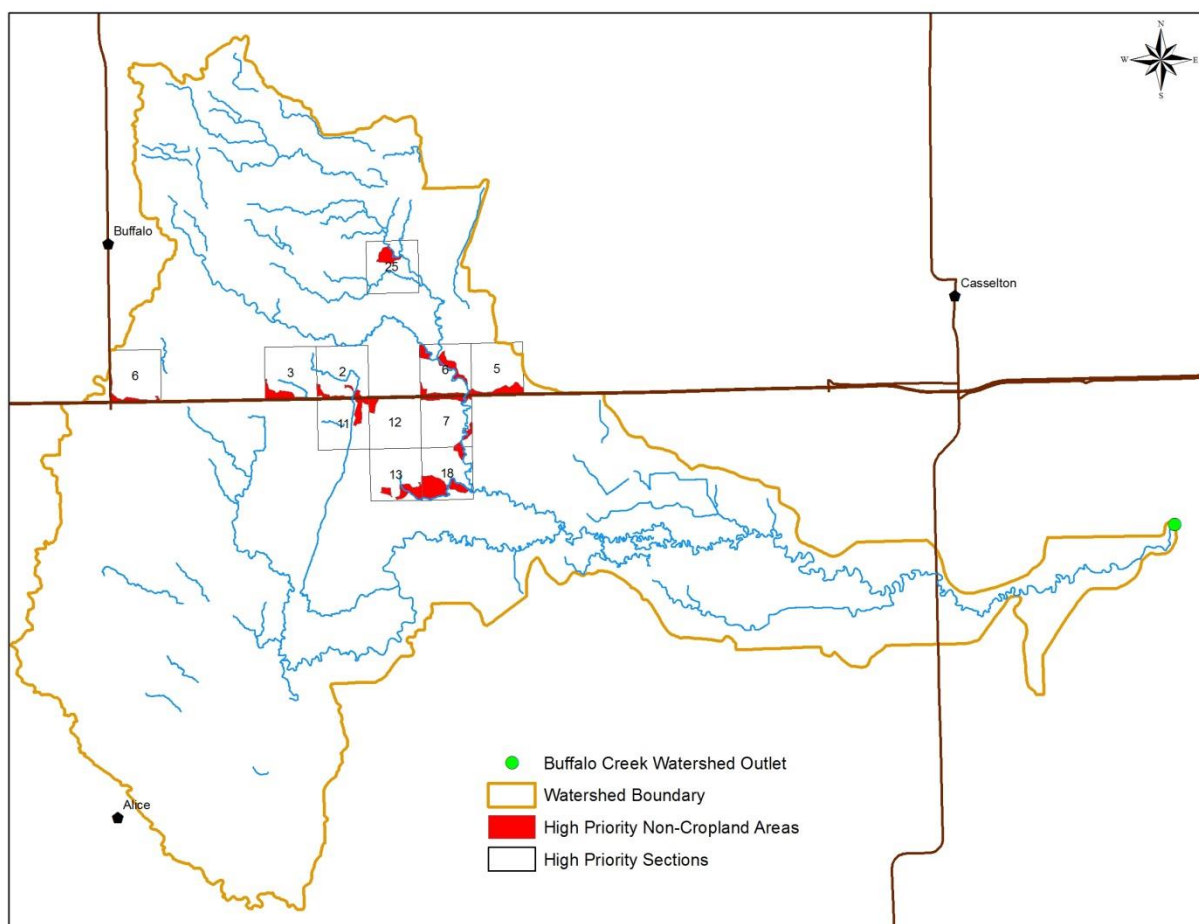


**Map 4**  
**AnnAGNPS Modeled High Priority Cropland Acres**





**Map 5**  
**AnnAGNPS Modeled High Priority Pasture/Grazing Areas**



## **Appendix B**

### **Budget**



Phase II, Maple River Watershed Project						
BUDGET TABLE						
PART 1: FUNDING SOURCES	2014	2015	2016	2017	2018	TOTAL
<b>EPA SECTION 319 FUNDS</b>						
1) FY14 Section 319 Funds	\$ 56,756	\$ 56,756	\$ 56,756	\$ 56,756	\$ 56,756	\$ 283,778
<b>Subtotals</b>	<b>\$ 56,756</b>	<b>\$ 56,756</b>	<b>\$ 56,756</b>	<b>\$ 56,756</b>	<b>\$ 56,756</b>	<b>\$ 283,778</b>
<b>OTHER FEDERAL FUNDS *</b>						
1) NRCS (TA)	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 250,000
2) NRCS EQUIP & WHIP (FA)	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 400,000
3) NRCS CSP (FA)	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 1,500,000
<b>Subtotals</b>	<b>\$ 430,000</b>	<b>\$ 430,000</b>	<b>\$ 430,000</b>	<b>\$ 430,000</b>	<b>\$ 430,000</b>	<b>\$ 2,150,000</b>
<b>STATE/LOCAL MATCH</b>						
1) Local SCD (TA, FA)	\$ 20,588	\$ 20,588	\$ 20,588	\$ 20,588	\$ 20,588	\$ 102,940
5) Cass County Participating Producers (cash/inkind)	\$ 17,249	\$ 17,249	\$ 17,249	\$ 17,249	\$ 17,249	\$ 86,246
<b>Subtotals</b>	<b>\$ 37,837</b>	<b>\$ 37,837</b>	<b>\$ 37,837</b>	<b>\$ 37,837</b>	<b>\$ 37,837</b>	<b>\$ 189,186</b>
<b>TOTAL BUDGET</b>	<b>\$ 524,593</b>	<b>\$ 524,593</b>	<b>\$ 524,593</b>	<b>\$ 524,593</b>	<b>\$ 524,593</b>	<b>\$ 2,622,964</b>
<b>319 BUDGET</b>	<b>\$ 94,593</b>	<b>\$ 94,593</b>	<b>\$ 94,593</b>	<b>\$ 94,593</b>	<b>\$ 94,593</b>	<b>\$ 472,964</b>

Phase II, Maple River Watershed Project									
BUDGET TABLE									
PART 2: Section 319 / Non-Federal Budget Funds		2014	2015	2016	2017	2018	TOTAL	In-Kind Match	319 Funds
<b>OBJECTIVE 1: Personnel/Support</b>									
	Task 1								
1)	Salary/Fringe - Watershed Coordinator (full-time: 2080 hrs/yr)	\$ 35,360	\$ 36,400	\$ 37,440	\$ 38,480	\$ 39,520	\$ 187,200	\$ 74,880	\$ 112,320
2)	Travel (7,000 miles/year at \$.56/mile)	\$ 3,920	\$ 3,920	\$ 3,920	\$ 3,920	\$ 3,920	\$ 19,600	\$ 7,840	\$ 11,760
3)	Training	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 1,500	\$ 600	\$ 900
4)	Cell phone (12/mo @ \$30/mo.)	\$ 360	\$ 360	\$ 360	\$ 360	\$ 360	\$ 1,800	\$ 720	\$ 1,080
5)	SCD Meetings/Inkind (12 mtgs)	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 6,000	\$ 2,400	\$ 3,600
	<b>Subtotals</b>	<b>\$ 41,140</b>	<b>\$ 42,180</b>	<b>\$ 43,220</b>	<b>\$ 44,260</b>	<b>\$ 45,300</b>	<b>\$ 216,100</b>	<b>\$ 86,440</b>	<b>\$ 129,660</b>
<b>OBJECTIVE 2 - 4: BMP's</b>									
	Tasks 3 - 8								
1)	Implement BMP Practices (see attached BMP priority list )	\$ 43,123	\$ 43,123	\$ 43,123	\$ 43,123	\$ 43,123	\$ 215,614	\$ 86,246	\$ 129,368
	<b>Subtotals</b>	<b>\$ 43,123</b>	<b>\$ 43,123</b>	<b>\$ 43,123</b>	<b>\$ 43,123</b>	<b>\$ 43,123</b>	<b>\$ 215,614</b>	<b>\$ 86,246</b>	<b>\$ 129,368</b>
<b>OBJECTIVE 5: Water Quality Monitoring</b>									
1)	Equipment replacement/repair	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 2,500	\$ 1,000	\$ 1,500
2)	Sample Transportation	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 2,500	\$ 1,000	\$ 1,500
	<b>Subtotals</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 5,000</b>	<b>\$ 2,000</b>	<b>\$ 3,000</b>
<b>OBJECTIVE 8: Information/Education</b>									
1)	Information/Education Meetings	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 5,000	\$ 2,000	\$ 3,000
2)	No-till Demonstration site	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 30,000	\$ 12,000	\$ 18,000
3)	Publications	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 1,250	\$ 500	\$ 750
	<b>Subtotals</b>	<b>\$ 7,250</b>	<b>\$ 7,250</b>	<b>\$ 7,250</b>	<b>\$ 7,250</b>	<b>\$ 7,250</b>	<b>\$ 36,250</b>	<b>\$ 14,500</b>	<b>\$ 21,750</b>
<b>TOTAL 319/NON-FEDERAL BUDGET</b>		<b>\$ 92,513</b>	<b>\$ 93,553</b>	<b>\$ 94,593</b>	<b>\$ 95,633</b>	<b>\$ 96,673</b>	<b>\$ 472,964</b>	<b>\$ 189,186</b>	<b>\$ 283,778</b>

Phase II, Maple River Watershed Project										
PART 3: Priority Best Management Practices (BMPs)										
								FUNDING		
Objectives	NRCS Code	Practice**	No.*	Acres*	Linear Feet (LF)*	Rate	TOTAL	Cost-share Rate	Cash Costs	319 Match
Objective 2	19	Septic System Rennovation	15			\$ 6,000.00	\$ 90,000	60%	\$ 36,000	\$ 54,000
	472	Use Exclusion		1,500		\$ 15.00	\$ 22,500	60%	\$ 9,000	\$ 13,500
	614	Watering Facility	5			\$ 1,000.00	\$ 5,000	60%	\$ 2,000	\$ 3,000
	516	Pipelines			1,500	\$ 6.00	\$ 9,000	60%	\$ 3,600	\$ 5,400
	382	Fencing			2,500	\$ 1.00	\$ 2,500	60%	\$ 1,000	\$ 1,500
	380	Field Windbreak			26,400	\$ 0.26	\$ 6,864	60%	\$ 2,746	\$ 4,118
	340	Cover Crop		2,000		\$ 20.00	\$ 40,000	60%	\$ 16,000	\$ 24,000
Objective 3	340	Cover Crop		1,500		\$ 20.00	\$ 30,000	60%	\$ 12,000	\$ 18,000
	391	Riparian Forest Buffer		15		\$ 350.00	\$ 5,250	60%	\$ 2,100	\$ 3,150
	390	Riparian Herbaceous Cover		15		\$ 300.00	\$ 4,500	60%	\$ 1,800	\$ 2,700
								60%	\$ -	\$ -
		<b>SUBTOTALS</b>	<b>20</b>	<b>5,030</b>	<b>30,400</b>		<b>\$ 215,614</b>		<b>\$ 86,246</b>	<b>\$ 129,368</b>

Phase II, Maple River Watershed Project									
I/E Demo Project		2014	2015	2016	2017	2018	TOTAL	Match	319
EPA SECTION 319 FUNDS									
1) No till Demo Plot 160acre	***Demo Site Land Rental	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 30,000	\$ 12,000.0	\$ 18,000.0
2) Planning	NRCS Contributions, In-kind	\$ -					\$ -	\$ -	\$ -
3) Tours	Farm Tours <i>Task 10</i>	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 5,000	\$ 2,000.0	\$ 3,000.0
	<b>Subtotals</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>	<b>\$ 7,000</b>	<b>\$ 35,000</b>	<b>\$ 14,000</b>	<b>\$ 21,000</b>
*Land rent based on \$75/ acre									

Phase II, Maple River Watershed Project								
Milestone Table								
	Task/Responsible Organization	Output	Quantity	Year 1 2014	Year 2 2015	Year 3 2016	Year 4 2017	Year 5 2017
Objective 1	Entity 1							
Task 2	Employ Watershed Coordinator		1	x	x	x	x	x
Objective 2	Entity 1,2,3							
Task 3	Reduce E. Coli Bacteria	Septic System Renovations	15	3	3	3	3	3
Task 4	Livestock BMP	Grazing Management Plans	10	2	2	2	2	2
		Cover Crop	2,000 ac	400 ac	400 ac	400 ac	400 ac	400 ac
		Field Windbreak	5 mi	1mi	1mi	1mi	1mi	1mi
		Grazing Exclusion	1,500 ac	250 ac	250 ac	250 ac	250 ac	250 ac
Objective 3	Entity 1,2,3							
Task 5	Cover Crop, soil improvement	Cover Crop, residue management	1,500 ac	300 ac	300 ac	300 ac	300 ac	300 ac
Task 6	Riparian Restoration	Forest and Grass Buffers	30ac	6ac	6ac	6ac	6ac	6ac
Task 7	Riparian Restoration	FSA CRP acres	500ac	100ac	100ac	100ac	100ac	100ac
		Buffers	50ac	10ac	10ac	10ac	10ac	10ac
Objective 5	Entity 1,4							
Task 8	Monitor BMP effectiveness	Water Sampling		See QAPP				
Objective 6	Entity 1,3,5							
Task 9	No Till Demonstration Site	80 acre Demo Plot		Ongoing throughout project period				
Task 10	SCD and Cooperating Agencies	Field Tours		Farm tour annually, 5 workshops, 2 BMP demos				
Task 11	SCD	Newsletters, Mailings, Brochures		Quarterly newsletter, 2 mailings, 1 brochure				

Entity 1 - Cass County SCD - Local project sponsor, responsible for project coordination, reimbursement payments, match tracking, and progress reporting to the NDDoH. Also provides technical assistance to plan, design and implement BMP.

Entity 2 - Landowners in the Buffalo Creek subwatershed in Cass County - Make land management decisions and provide cash and in-kind match for BMP.

Entity 3 - Natural Resource Conservation Service - Provides technical assistance to the Cass County SCD for implementation of BMP. Also provides financial assistance for BMP to landowners through the EQIP program.

Entity 4 - North Dakota Department of Health- Statewide section 319 program management including oversight of local 319 planning and expenditures. Also provides technical assistance for water quality analysis and documentation.

Entity 5 – NDSU Extension Service. Assist with planning I/E events. Provide technical assistance and source of in-kind match.

**Appendix C**

**Phase I BMP  
Implementation**

# Summary Of Billing Period Expenditures On BMP's

***Project: Maple River***

***Time Period: 1/1/2010 To 9/25/2013***

NOTE: For multiple year practices where the Planned Amount differs from the Actual Amount Applied, a cumulative Planned Amount value will be used for this Summary Report. However, the Cost Share, Match, etc, are calculated from the Actual Total Yearly Cost input.

## ***Cropland Management***

<b><i>Cropland Management</i></b>				<b>Cumulative Amount</b>	<b>Units</b>	<b>Total 319 Cost Share</b>	<b>Total Producer</b>	<b>Total BMP In-Kind</b>	<b>Total BMP Costs</b>
<b>Code</b>	340	<b>Practice</b>	Cover Crop	1772.17	Acres	\$23,703.32	\$15,802.21	\$0.00	\$39,505.53
<b>Cropland Management Totals:</b>						<b>\$23,703.32</b>	<b>\$15,802.21</b>	<b>\$0.00</b>	<b>\$39,505.53</b>

## ***Miscellaneous Practices***

<i>Miscellaneous Practices</i>				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	018	Practice	Miscellaneous (Miscellaneous Practices)	2	Misc	\$540.00	\$360.00	\$0.00	\$900.00
Code	019	Practice	Septic System Renovation	25	Number	\$105,214.07	\$70,142.71	\$0.00	\$175,356.78
Code	351	Practice	Well Decommissioning	16	Number	\$27,055.40	\$18,036.94	\$0.00	\$45,092.34
Miscellaneous Practices Totals:						\$132,809.47	\$88,539.65	\$0.00	\$221,349.12

## ***Riparian Area Management***

<i>Riparian Area Management</i>					Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	580	Practice	Streambank and Shoreline Stabilization		250	Linear Feet	\$27,656.96	\$18,437.97	\$0.00	\$46,094.93
<b>Riparian Area Management Totals:</b>							<b>\$27,656.96</b>	<b>\$18,437.97</b>	<b>\$0.00</b>	<b>\$46,094.93</b>

## Summary Of Billing Period Expenditures On BMP's

<i>Upland Tree Planting</i>				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs	
Code	612	Practice	Tree/Shrub Establishment	53	Per 100 Ft	\$676.20	\$450.80	\$0.00	\$1,127.00	
Code	060	Practice	Weed Control For Established Trees (Weed Barrier)	49	Per 100 Ft	\$1,323.00	\$882.00	\$0.00	\$2,205.00	
Code	380	Practice	Windbreak/Shelterbelt	26.4	Per 100 Ft	\$398.52	\$265.68	\$0.00	\$664.20	
Upland Tree Planting Totals:						\$2,397.72	\$1,598.48	\$0.00	\$3,996.20	
						Buffalo Creek Totals:	\$186,567.47	\$124,378.31	\$0.00	\$310,945.78



**Appendix D**  
**Section 319 Funding Agreement Provisions**

**EPA 319 Funding Agreement Provisions  
(Attachment to EPA 319 CPO)**

Each undersigned person agrees to participate in the EPA 319 Water Quality Long Term Agreement (LTA) and to comply with the following terms set forth and approved by the Sponsoring Agencies for the period covered by this agreement. The terms are as follows:

1. The conservation and/or environmental problems identified herein represent all the major concerns whereby increased water quality improvements will be achieved on this land unit which will directly or indirectly improve the total water quality of the watershed project. The corrective measures needed for the identified problems are contained in the Conservation Plan of Operations (CPO) as approved by the Governing Board Sponsors. All practices shall be performed according to the CPO and in accordance with the Natural Resources Conservation Service (NRCS) standards and specifications in effect at the time the practice is performed. The practices shall be maintained for their normal lifespans even though the agreement may expire. The practices eligible for cost share assistance will be in accordance with the agreed upon CPO or subsequently revised CPO and will be shown by year scheduled and copies of revised CPO will be issued to the farm operator.
2. Application of the EPA 319 Water Quality Funds for cost share on practices performed under this agreement will be made on a Sponsoring Board approved payment application form which upon approval will become part of this agreement.
3. Each undersigned person is jointly and severally responsible for compliance with the terms and conditions of this agreement as to the conservation and environmental problems identified in the CPO which are to have corrective measures performed on the land units on which the undersigned is an owner or operator and for refund of payments determined in accordance with the following regulations for failure to comply with the terms and conditions of this agreement.
  - A. The undersigned voluntarily destroys the practice(s) installed.
  - B. The undersigned voluntarily relinquish control and/or title to the land on which the installed practices have been established and the new owner and/or operator of the land does not agree in writing to properly maintain the practices installed for the remainder of its specified lifespan and/or continue to fulfill the remaining contract requirements.
  - C. Practice failure is determined by sponsors to be caused primarily by the fault of the undersigned.
  - D. Any part of the CPO that is not followed or completed as scheduled will be a contract violation and refund of all cost shared contract items will be collected depending on the violation hearing and ruling of the Board Sponsors, unless advance notification and revision of the CPO is completed prior to the scheduled contract items completion date.
4. The undersigned is aware that all land units identified in the CPO will not be listed under any other contract through this program or any similar program. Intentional violation of this section will void the entire contract and refund of all payments will be required.

I certify that I have read and understand the provisions listed above:

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Appendix E**  
**Crosswalk between this Alternative Plan and EPA's Considerations for**  
**an Alternative Plan**

## **Crosswalk for Buffalo Creek Alternative Plan and EPA Region 8's Consideration Table**

This crosswalk was developed to summarize how the Buffalo Creek Alternative Plan addresses the considerations put forth in EPA Region 8's discussion of alternative plans (Table 1.) The number in the summary corresponds to the Alt Plan Considerations Number in the table that follows.

- 1) This information is provided on page 2 as well as in Section 2.2 Watershed Description and Section 2.5 Water Quality.
- 2) The WQS are identified in Section 2.5 Water Quality, and the target is identified in Section 3.2 Objectives and Tasks, Objective 2. Management measures are also identified in this Section and Objective. Specific practices are also mentioned at the end of Section 2.2.
- 3) Implementation goals are provided in Section 3.2 as well as the milestone table in Appendix B.
- 4) Funding sources are provided in the budget table in Appendix B.
- 5) Project Sponsors are listed in Section 3.5 and the coordination plan is discussed in Section 4.0.
- 6) The timeframe of when WQS will depend on many factors such as landowner interest, economic conditions, weather, etc. To address this, as identified in Section 3.2, Objective 4, it states that water quality sampling will be conducted as BMPs are installed to monitor effectiveness. Section 5.0 discusses how monitoring and evaluation will be conducted to describe progress towards the established targets. If progress is not deemed sufficient, a TMDL will be completed. The Implementation Project will run from 2014 to 2018.
- 7) Effectiveness monitoring is described in #6 above.
- 8) This will be done as a part of the effectiveness monitoring. As stated in Section 5.0, at the end of the project a larger report summary will also be written to see if sufficient progress towards the targets has been made. If E. coli water quality standards are not met within a reasonable period of time after implementation is complete, a TMDL will be developed.

Table 1. EPA Region 8 Summary of the Alternative (Alt) Plan Considerations<sup>1</sup>

<b>Alt Plan Considerations Number</b>	<b>Alt Plan Considerations Summary Description</b>	<b>Potential Information to Include an Alternative Plan</b>
<b>1</b>	Identify the specific impaired waters, causes, and sources	<ul style="list-style-type: none"> <li>• Assessment Unit (AU) numbers, descriptions and pollutants that match state's most recent 303(d) list</li> <li>• Include a list or table of all contributing permitted point sources</li> <li>• Identify general nonpoint source (NPS) contributors by category</li> <li>• Include relative source contribution estimates</li> </ul>
<b>2</b>	Clearly identify the target(s), consistent with water quality standards (WQS), which will be used to demonstrate restoration. Provide an analysis that shows how planned implementation actions can meet that target(s).	<ul style="list-style-type: none"> <li>• Clear target(s) consistent with WQS</li> <li>• Load reduction estimates needed to meet the target</li> <li>• Description of the management measures that will need to be implemented to achieve load reductions</li> </ul>
<b>3</b>	Provide an implementation plan to address all sources and a schedule with milestones and target dates	<ul style="list-style-type: none"> <li>• A schedule with proposed controls and target dates</li> <li>• A description of interim measurable milestones</li> </ul>
<b>4</b>	Identify sources of available funding to implement the plan	<ul style="list-style-type: none"> <li>• A table, list, or description of the available funding sources</li> </ul>
<b>5</b>	Identify all parties committed to or assisting in implementation	<ul style="list-style-type: none"> <li>• A table, list, or description of all parties that are committed to or assisting in implementation</li> </ul>
<b>6</b>	Provide an estimate or projection of time when WQS will be met	<ul style="list-style-type: none"> <li>• An estimated date or number of months/years</li> </ul>
<b>7</b>	Describe the plans for effectiveness monitoring to show restoration progress and identify corrective measures	<ul style="list-style-type: none"> <li>• A plan for effectiveness monitoring designed to show restoration progress and identify corrective measures</li> </ul>
<b>8</b>	Describe the plans to periodically evaluate the alternative plan to determine if it's on track to more immediately meet WQS, or if adjustments need to be made, or if impaired water should be assigned a higher priority for TMDL development.	<ul style="list-style-type: none"> <li>• A plan to periodically evaluate the alternative plan to determine if it's on track to meet WQS or if adjustments need to be made</li> </ul>

<sup>1</sup> Table 1 is Region 8's summary of the alternative plan considerations and potential information to include in an alternative plan. The full description of the alternative restoration approach, the circumstances to consider, the elements to consider and the use of the 5-alternative IR category is contained in the 2016 IR memorandum, available at: [https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8\\_13\\_2015.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf).

