LITTLE POWDER RIVER WATERSHED PLAN

A comprehensive natural resource management plan designed to address water quality issues in the Little Powder River Watershed.

DEVELOPED IN COOPERATION BY:

CAMPBELL COUNTY CONSERVATION DISTRICT
LITTLE POWDER RIVER WATERSHED STEERING COMMITTEE

ASSISTANCE PROVIDED BY:

WYOMING ASSOCIATION OF CONSERVATION DISTRICTS
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING
DECEMBER 2006

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3
MISSION STATEMENT 3
PURPOSE STATEMENT 3
CLEAN WATER ACT 3
WDEQ'S ROLE 3
CCCD'S ROLE 4
CONSERVATION DISTRICT'S PLANNING AUTHORITY 4
PUBLIC PARTICIPATION STRATEGY 5
BACKGROUND INFORMATION 6
WATER QUALITY OF LITTLE POWDER RIVER 6
WATERSHED DESCRIPTION 8
GEOLOGY 8
LAND USE 9
HYDROLOGY AND METEOROLOGY 9
WATER QUALITY EFFORTS TO DATE 9
WATERSHED ISSUES AND CONCERNS 10
INDUSTRY 10
Oil & Gas Developments 10
Coal Mining Operations 10
Road Construction 10
Pipeline Installations 10
AGRICULTURE 10
Livestock Management 10
Corrals 10
Information & Education 10
ECONOMIC IMPACTS OF REMEDIATION 10
RURAL AREAS 10
Small Acreage Management 10
Septic Systems 11
WILDLIFE 11
WATER QUALITY MONITORING 11
DESIGNATED USE CLASSIFICATION 11
INTERSTATE ISSUES AND COORDINATION WITH OTHER ENTITIES 11
OBJECTIVES TO ADDRESS WATERSHED ISSUES AND CONCERNS 11
INDUSTRY 11
Oil & Gas Developments 12
Coal Mining Operations 12
Road Construction 12
Pipeline Installations 13
AGRICULTURE 13
Livestock Management 13
Corrals 13
Information & Education 14
ECONOMIC IMPACTS OF REMEDIATION 14
RURAL AREAS 15
Small Acreage Management 15
Septic Systems 15
WILDLIFE 16
WATER QUALITY MONITORING 16
DESIGNATED USE CLASSIFICATION 17
INTERSTATE ISSUES AND COORDINATION WITH OTHER ENTITIES 17
MILESTONE TABLE 19
Appendix A: Use Classification Table 28
Appendix B: Watershed Maps & Project Map 29
Appendix C: Raw Data 32
Appendix D: Acronyms 44
Appendix E: Response to Public Comments 45

EXECUTIVE SUMMARY

MISSION

The Little Powder River Drainage Steering Committee will address concerns with fecal coliform and other water quality standards through a voluntary, landowner driven process.

PURPOSE

The purpose of the Little Powder River Watershed Plan is to:

1. Evaluate and summarize the condition of the Little Powder River.
2. Maintain local control and initiate a proactive effort to prevent potential governmental regulation, due to the listing of the Little Powder River on Table A of the 303(d) List of Impaired Waterbodies.
3. To promote the use of voluntary BMPs, respecting private property rights that will improve water quality in the Little Powder River through providing technical and financial assistance.
4. Develop and implement an effective public education program, focusing on water quality issues specific to the Little Powder River Watershed.
5. Continue water-monitoring activities to evaluate implementation of this watershed plan in an effort to improve water quality.
6. To outline a schedule of activities as an effort to remove the Little Powder River from Table A of Wyoming DEQ's 303(d) List of Impaired Waterbodies.

CLEAN WATER ACT

The Clean Water Act (CWA) was adopted by Congress for two primary purposes. That is to:

- restore and maintain the chemical, physical, and biological integrity of the nation's waters; and
- where attainable, to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provide for recreation in and on the water. This goal is commonly known by the expression "fishable/swim able".

The US Environmental Protection Agency (EPA) has responsibility to ensure that provisions of the CWA are met. With regard to Wyoming, EPA has delegated authority to the Wyoming Department of Environmental Quality (WDEQ) to ensure compliance with the CWA. In states without delegated authority, EPA retains responsibility for CWA compliance.

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY'S ROLE

In order to ensure compliance with the CWA, WDEQ had to establish a system for evaluating and protecting waterbodies. Since all waters are not used for the same purpose, no single set of standards could be established to reasonably address water quality concerns. For this reason, WDEQ classified each waterbody within the state. The classifications were based on "designated uses" designed to reflect what the water is currently used for or what the water could potentially be used for. Examples of designated uses include agriculture, industry, drinking water and fisheries among others.

Different combinations of assigned designated uses resulted in a single classification for each waterbody (Appendix A). WDEQ then established water quality criteria (narrative or numeric standards) applicable to each classification to ensure that water quality is sufficient to support all of the designated uses. Water quality criteria, therefore, are different for each classification.

In addition to establishing a system for evaluating water, WDEQ must also report the condition of the State's water. Under Section 305(b) of the CWA, the State of Wyoming must report the condition of their water(s) to the EPA once every two years. This report, prepared by the WDEQ, is known as the 305(b) report. In addition to the 305(b) report, under section 303(d) of the CWA, States must identify those waters within its boundaries that are not meeting the water quality criteria ("impaired waters") applicable to that waterbody based on its classification. As mentioned earlier, States are required to address impaired water bodies by establishing water quality standards and pollution control activities designed to achieve and maintain the designated use(s).

CAMPBELL COUNTY CONSERVATION DISTRICT'S ROLE

Following the enactment of the CWA, EPA has delegated water quality assessment and regulatory responsibilities to WDEQ, which is the regulatory agency responsible for enforcement of the CWA as it applies to Wyoming waters. Local Conservation Districts; by statutory authority have assumed the responsibility of leading information and education programs, and providing technical and financial assistance to their constituents to conserve Wyoming's natural resources, and to protect the quality of life of all Wyoming citizens. The CCCD has served as a liaison between WDEQ and local land managers within the Little Powder River Watershed to address water quality concerns and to investigate historical and background conditions as they apply to environmental compliance with regard to water quality standards. The CCCD has also endorsed the formation of the Little Powder River Watershed Plan Steering Committee; to develop a locally-led, voluntary and incentive-based watershed management plan to improve water quality while preserving the economic sustainability of agricultural operations within the Little Powder River Watershed.

CONSERVATION DISTRICT'S PLANNING AUTHORITY

Under Wyoming Statute, 11-16-103 Legislative declarations and policy, the CCCD is required to "provide for the conservation of the soil and soil and water resources of this state, and for the control and prevention of soil erosion and for flood prevention or the conservation, development, utilization, and disposal of water, and thereby to stabilize ranching and farming operations, to preserve natural resources, protect the tax base, control floods, prevent impairment of dams and reservoirs, preserve wildlife, protect public lands, and protect and promote the health, safety and general welfare of the people of this state."

Wyoming Statute 11-16-122 (b) grants the Conservation Districts the ability to "conduct surveys, investigations and research and disseminate information relating to . . . the conservation, development, utilization and disposal of water. . . in cooperation with the government of this state or its agencies . . . (v)," to "develop comprehensive plans for . . . conservation of soil and water resources . . .[that] specify in detail the acts, procedures,

performances, and avoidances necessary or desirable to carry out the plans (xvi)," and to "make public the plans and information and bring them to the attention of owners and occupiers of land within the district (xvii)."

In 1996, Wyoming Conservation Districts, the Natural Resources Conservation Service and the Wyoming Department of Agriculture saw an increasing need for Conservation Districts to represent local interests and take the lead in watershed planning efforts. As a result they developed the Watershed Strategic Plan to guide watershed planning efforts across the state. This document insists that "any Watershed effort led by a Conservation District should be landowner driven. . .[and] any participation on behalf of any landowner is strictly voluntary." By taking an active role in the planning process, the Little Powder River Watershed landowners and the CCCD have adhered to this principle. The landowners have followed the steps for watershed planning as outlined in the Watershed Strategic Plan. They have identified concerns, set goals and objectives, and developed a watershed management plan. Included in the Little Powder River Watershed Plan are elements to solicit funds, implement the plan, and evaluate the plan.

PUBLIC PARTICIPATION STRATEGY

Public participation is a vital component of the watershed planning process that was used by CCCD to develop this watershed plan. Watershed planning efforts led by Conservation Districts within the State of Wyoming are completed using the Wyoming Association of Conservation Districts (WACD) Watershed Strategic Plan, which specifically addresses public participation with the following statement:

> *Public input is one of the most important steps in the watershed planning process. The conservation district can choose the extent of public input when creating their plan. At a minimum, the district should follow the Administrative Procedures Act (W.S. 16-3-101 et seq.,) which requires a public notification process, a timed 45 day public hearing/review process, and final approval of the plan by the board of supervisors.*

CCCD initiated awareness efforts for the impairments on Little Powder River on November 14, 2002 by hosting a public meeting at the Campbell County Library announcing the impairments and soliciting ideas for addressing the concern. On February 27th, 2003, another public meeting was hosted to inform local landowners of their options in addressing the impaired segments on Little Powder River. The Little Powder River Steering Committee was formed at this February 27th meeting. The first Steering Committee meeting for watershed planning was held April 7th, 2003. The Steering Committee has been meeting on a regular basis since then to develop this document.

The Little Powder River Watershed Plan will be available for public comment from September 20 through November 3, 2006 before being submitted to WDEQ for final approval. Once the watershed plan is adopted by WDEQ and local landowners, CCCD

will continue with implementation of the plan and continue to work towards the goal of removal of Little Powder River from the WDEQ 303(d) list of impaired water bodies.

BACKGROUND INFORMATION

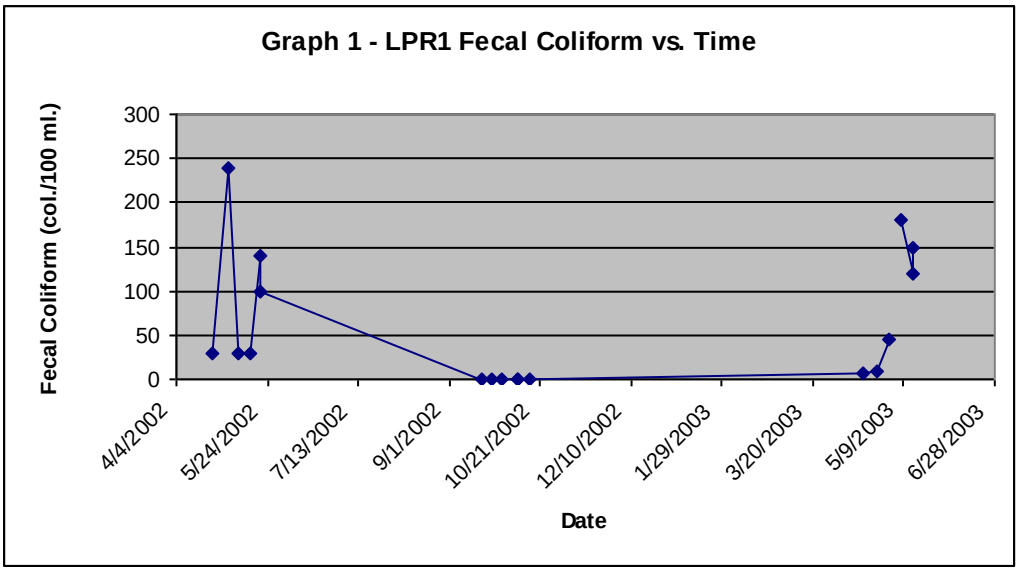
WATER QUALITY OF LITTLE POWDER RIVER

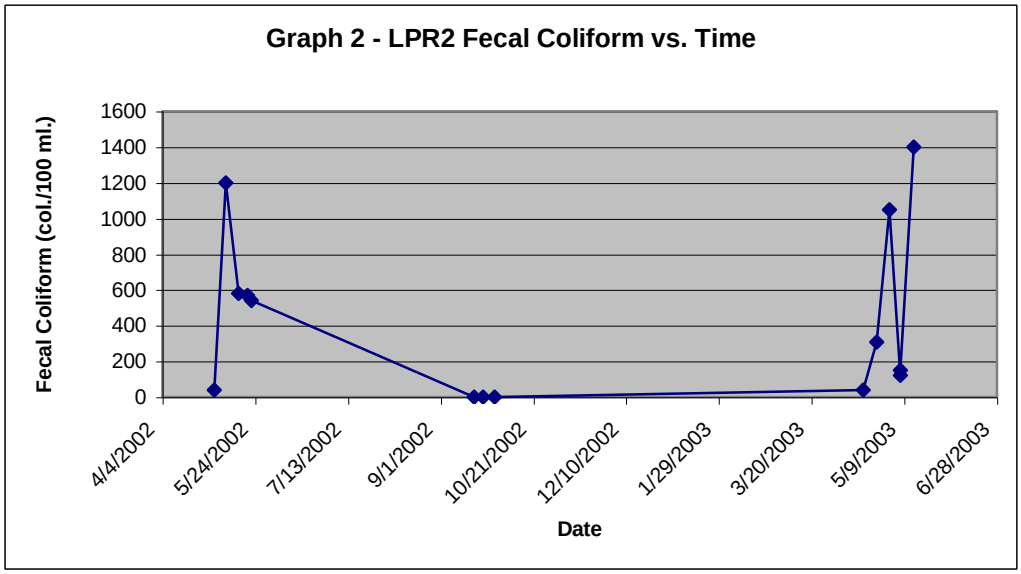
Little Powder River was initially included on the Wyoming 2002 Section 303(d) list, Table C, threatened waterbodies. This stream was listed as threatened for contact recreation designated use impairment by fecal coliform. This segment was listed by the USGS Station ID# 06324970, Wyoming/Montana state line upstream an undetermined distance. Little Powder River has been elevated on the Wyoming 2006 Section 303(d) list, to Table A, impaired waterbodies as a low priority for TMDL development due to this watershed planning effort.

The District sampled Little Powder River in 2002 and 2003. There were two sites on Little Powder River and two sites on Horse Creek (tributary to Little Powder River). The data was reviewed for both temporal and spatial relationships and trends. Based upon the limited data set of 3 sample sets (5 samples in 30 days = 1 set), the analysis reveals no definitive spatial parameter correlations between sites on the Little Powder River and Horse Creek. The analysis examined the data between sites to determine if an upstream-downstream relationship or trend exists on the streams. No definitive trends were identifiable.

The analysis techniques and detection limits used for *E. Coli* and *Total Coliform* bacteria varied during the sampling period, therefore there are variable results that are not directly comparable. The various analytical methods included: absence or presence method/results, plate enumeration method/results with varied detection limits of: less than 100 colonies/100 ml, 10 colonies/100 ml, and 1 colony/100 ml. The variation in analytical method and detection limit does not lend the *E. Coli* and *Total Coliform* data to trend analysis. *Fecal coliform* results are more consistent providing definitive numbers down to less than 1 (the apparent analytical limit). Consequently, among these bacteria, the *Fecal Coliform* results are the best suited to trend analysis.

A possible temporal correlation can be seen at the Little Powder River sites indicating substantially higher concentrations of *Fecal Coliform* in the spring (May/June) than in the fall (September/October). Graphs 1 and 2 depict this relationship as colonies vs. time for sampling sites LPR1 and LPR2.





In the sampling CCCD has conducted since the spring of 2002, only LPR2 has exhibited an exceedence of Wyoming's water quality standard for fecal coliform. Both exceedences on LPR2 have occurred during the spring sampling period. This may indicate that overland flow and runoff are contributing bacteria to Little Powder River. Lack of flow has been a primary reason for lack of data at LPR1 and on both sites on Horse Creek. This data indicates that a secondary contact recreation use designation may be appropriate for the Little Powder River and its tributaries. There have been BMPs installed on this segment of the Little Powder River to improve livestock distribution. Preliminary data from the spring sampling of 2006 indicates the water quality of LPR2 has improved possibly due to the implementation of BMPs such as AFO improvements and upland water development in grazing pastures through a Section 319 grant. The preliminary data from the spring of 2006 at LPR1 however did not improve. There is no known explanation for this result.

DIKE BUILT ABOVE LPR2 SAMPLE SITE

BEFORE PICTURE OF CORRALS

AFTER PICTURE OF CORRALS

WATERSHED DESCRIPTION

With its origin just north of Gillette, the Little Powder River is bounded on the east by the Belle Fourche and the Little Missouri River watersheds and on the west by the Powder River watershed. Appendix B shows the extent of the watershed and the monitoring site locations in the drainage. The Little Powder River watershed consists of 1,295,560 acres. The basin relief is 1,870 feet and the channel length is 177 miles. Flowing northward, the Little Powder River enters the Powder River several miles northeast of Broadus, Montana. Few population centers exist in the watershed with Recluse, Wyoming on the drainage divide between Little Powder River and Powder River. A number of significant tributaries flow into Little Powder River. These include; Rawhide, Cottonwood, Wild Cat and Horse Creeks. Highway 59 dissects the watershed for the majority of its' length. USGS data indicates that perennial flow is common on the stream with only nine no flow records at the two primary sites monitored in the watershed since 1975. Surface ownership of the drainage's 548,990 acres is primarily private at 416,152 acres or 75.8%. The remaining land is owned by the federal government having 95,181 acres or 17.3%, and the State of Wyoming having 37,437 acres or 6.8%.

GEOLOGY

Tertiary units dominate geology of the Little Powder River watershed. From south to north these include the Wasatch Formation, and Tongue River Member, Lebo Shale Member and Tullock Member of the Fort Union Formation. Additionally, Quaternary Alluvium underlies the majority of the near stream area while a minor amount of the Cretaceous Lance Formation outcrops near the Wyoming-Montana State Line (Love, 1985).

LAND USE

The principal land uses in the Little Powder River watershed are agriculture and energy development. Potential influences to water quality and quantity in the watershed include surface coal mines and discharges of water from Coal Bed Natural Gas and oil production. Surface coal mines include Buckskin Mine, Eagle Butte, Rawhide Mine, and Dry Fork Mine just north of Gillette. Significant gas producers in the drainage are Marathon, Redstone (Fidelity), Devon, Yates and RMG with a number of smaller operators also in the area.

HYDROLOGY AND METEOROLOGY

Meteorological information critical to understanding the basic hydrology of the watershed was taken from the Western Regional Climate Center. Because of the integrated relationship between water quality/quantity and precipitation/temperature, especially in prairie type streams, information from Gillette (1925 through 2003), Recluse (1948 through 2003) and Weston (1951 through 2003), Wyoming was included. Higher than average temperatures were recorded at Weston and Gillette during the summer of 2003. In fact, the hottest August for the period of record was recorded at Weston, Wyoming in 2003. Precipitation values also indicate more extreme conditions with lower than average moisture measurements for all the sites near/within the watershed. These conditions may have led to higher than average evaporation rates and subsequent concentration of dissolved constituents at the sites. Moreover, the higher temperatures *may* play a role in the growth of larger than average bacteriological concentrations and should be kept in mind when reviewing both quality and quantity data from the watershed.

WATER QUALITY EFFORTS TO DATE

There have been significant conservation efforts within the Little Powder River Watershed over the past five years. These implementation projects have particular relevance to the Little Powder River's impaired status as they were done in an effort to improve grazing distribution through upland water development. There has been approximately 50 miles of pipeline installed to serve 70 stock tanks with prescribed grazing management plans on 160,327 acres through the Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP) alone. There has been another 20 stock tanks installed using a combination of programs including the Farm Service Agency's (FSA) Emergency Conservation Program (ECP), Wyoming Water Development Commission's Small Water Project Program, the State of Wyoming's Solar Stockwater Pump Initiative and EPA Section 319 Grants.

In addition to addressing livestock impacts to water quality, CCCD has initiated a septic system and Animal Feeding Operation (AFO) cost-share program in an effort to repair failing septic systems on a voluntary and incentive-based approach. To date there have been 15 septic system rehabilitations and three AFO project implementations to reduce bacteria concentrations in the Little Powder River.

WATERSHED ISSUES AND CONCERNS

INDUSTRY - Industry plays an important role in the Little Powder River Watershed. Although WDEQ requires industrial developments to hold discharge permits, road development, rail bed maintenance and pipeline construction may contribute additional surface runoff and, therefore, bacteria to surface waters. Industry is closely monitored and must abide by all requirements prior to activity.

Oil and Gas Developments – Discharges of water from production operations and from the disturbance of vegetation increasing surface runoff are a concern.

Coal Mining Operations – Runoff from mine lands and discharged water may impact water quality but are point source in nature and are allowed under WYPDES Permits.

Road Construction – Road construction operations are also required to hold stormwater management plans, but the plans are enforced only sporadically. Road construction for coalbed methane development and mineral exploration are extensive.

Pipeline Installations – Pipe laying operations disturb vegetation and increase erosion thereby impacting water quality.

AGRICULTURE - The agricultural community has been an economic and cultural mainstay of the Little Powder River Watershed for generations. Specific agricultural based issues and concerns include:

Livestock Management – Winter feeding and calving areas adjacent to Little Powder River are a concern.

Corrals – There are corrals and feeding pens with either direct access to Little Powder River or man-made water conveyance structures with flow through confinement areas and both have potential to impact water quality.

Information and Education – Increase awareness and educate the community on options, including cost-share opportunities, for improving water quality through improved livestock and wildlife waste management, grazing management and irrigation management.

ECONOMIC IMPACTS OF REMEDIATION – Remediation should not place an undue economic burden on those who participate in BMP programs. In the instance of an agricultural operation, the economic viability of the operation should be a priority as BMP alternatives are considered. There are a variety of conditions within the watershed that make economic impacts hard to quantify. All residents in the watershed must carefully evaluate if any BMP implementation is feasible.

RURAL AREAS - Development in rural areas has a potential impact on water resources within the Little Powder River Watershed. The Little Powder River Watershed Steering Committee recognizes these potential impacts while respecting private property rights. Specific issues include:

Small Acre Land Management – There are some areas of small acre landowners, but these areas have limited potential to impact water quality at this point. There

may be more subdivision of larger tracts in the future and the impact on water quality will have to be considered.

Septic Systems – Most of the rural residents within the watershed rely on septic systems for household sewage treatment. Many of these systems have not been renovated and may be contributing bacteria to Little Powder River. There is a significant amount of information and education to be done as well as installation of operational septic systems. There have been multiple inquiries regarding septic systems that are newer than the NPS Task Force date of July 1, 1973. Many more septic systems could be remediated if funding is not contingent upon this date.

WILDLIFE - Whitetail, deer, antelope, small mammals, upland game birds and waterfowl are all contributors of bacteria to Little Powder River. Wildlife distribution may be indirectly improved through grazing management practices such as off-site development of water.

WATER QUALITY MONITORING - Continuing water quality monitoring is important to gain insight into data trends in response to changing climatic conditions and management decisions. A tremendous amount of data must be collected to determine the natural background conditions for the watersheds. As this watershed plan is implemented, sampling sites and dates may change in response to management activities or trends noticed in the data. For these reasons, the steering committee believes that local expertise in water quality issues is also important. Therefore, water quality training for CCCD employees is a priority.

DESIGNATED USE CLASSIFICATION - Little Powder River is an intermittent stream and a Use Attainability Analysis (UAA) should be pursued to reflect the actual risk of ingestion. Little Powder River is a small stream, characterized by mostly boggy areas with limited recreation potential as 75% of the watershed is privately owned, with no recreation areas. If WYDEQ's Chapter One, Water Quality Rules and Regulations are revised to include a secondary contact recreation criteria, this classification may more accurately reflect the Little Powder River.

INTERSTATE ISSUES AND COORDINATION WITH OTHER ENTITIES - Powder River County Conservation District in Montana has not done any monitoring to this point. Montana DEQ did some monitoring, but they found no impaired segments. There may be some watershed planning activities set to begin in Powder River Conservation District and they might be able to use this plan as a template for their own. DEQ, NRCS and other entities will need to be kept up to date as to the progress of this watershed plan.

OBJECTIVES TO ADDRESS WATERSHED ISSUES AND CONCERNS

INDUSTRY – Although most industrial activities are monitored and regulated by WDEQ, the Little Powder River Steering Committee recognizes that there are projects that can be implemented to help industry understand the water quality issues in the Little Powder River Watershed. Specific issues related to industry include:

Oil and Gas Developments –WDEQ is responsible for ensuring that Coal Bed Natural Gas water is discharged within the regulations. The Little Powder River Steering Committee considered this issue, but has little influence over how these reservoirs are constructed. There is a suite of parameters that can be tested to determine the influence of discharged water on background conditions. If a water monitoring data indicates changes over time, more intensive monitoring may be pursued.

OBJECTIVES

1. Establish a benchmark for water quality that encompasses the period prior to CBM development within the Little Powder River Watershed.

ACTION ITEMS

1. Continue to monitor water quality for discharged water from CBM wells by sampling for additional parameters.

Coal Mining Operations - Runoff from mine lands and discharged water may impact water quality but are point source in nature and are allowed under WYPDES Permits.

OBJECTIVES

1. Assist industrial entities (not limited to coal production companies) in complying with current rules and regulations in place to protect water quality.

ACTION ITEMS

1. CCCD and the City of Gillette will co-host a Stormwater Pollution Prevention Plan workshop to inform industry of the process for obtaining and implementing the plans.

Road Construction – The County may have projects for living snow fences or other projects that could positively influence water quality by providing a vegetative buffer zone and decreasing soil erosion.

OBJECTIVES

1. Increase the level of knowledge regarding availability of funds for cost-share on living snow fence projects.
2. Formulate a partnership between Campbell County Road and Bridge and the CCCD to use living snow fences on County roads.

ACTION ITEMS

1. Annually announce availability of cost-share funds for living snow fence installation through the CCCD Newsletter and website.
2. Annually include an article in the CCCD Newsletter highlighting living snow fences and their benefits.
3. Host a dust mitigation workshop in conjunction with Campbell County Commissioners.

4. Meet at least annually with the Campbell County Road and Bridge Superintendent to discuss improvement activities.

Pipeline Installation - Pipe laying operations disturb vegetation and increase erosion thereby potentially impacting water quality.

OBJECTIVES
1. Increase knowledge regarding reclamation techniques and the impact of vegetation and soils on soil erosion.

ACTION ITEMS
1. Host at least one reclamation workshop including a tour within the next five years to emphasize and promote the benefits of proper reclamation efforts.

AGRICULTURE – The agricultural community has been an economic and cultural mainstay of the Little Powder River Watershed for generations. Livestock management is an issue with particular relevance to bacteria concentrations, so implementation projects aimed at increasing grazing distribution will be a priority. The highest priority agriculture related issues and concerns include:

Livestock Management – Bureau of Land Management (BLM) and NRCS both influence grazing practices within the watershed. CBM water has also increased grazing distribution in recent years by providing water sources that previously did not exist.

OBJECTIVES
1. Inform agricultural producers of current grazing rules and regulations that impact their operations.
2. Inform agricultural producers of new technologies and practices with potential to improve water quality.
3. Implement agricultural BMPs to improve water quality.

ACTION ITEMS
1. The district will continue to provide the Aer-way Aerator for rent to producers wishing to increase infiltration and vegetative cover while reducing soil erosion.
2. Implement prescribed grazing management on 100,000 acres in the next five years. The management plan should include provisions for rangeland monitoring and schedules for pasture usage and rest, etc.
3. Install three grazing BMPs per year for the five years of the watershed plan. Grazing BMPs, according to WDEQ's Nonpoint Source Management Plan, include: Proper Grazing; Fencing; Livestock Herding; Access Roads; Water Development; Land Treatment; Weed and Pest Management; and Windbreaks.
4. CCCD will host a rangeland plant identification workshop during 2006.

Corrals - There are corrals and feeding pens with either direct access to Little Powder River or man-made water conveyance structures with flow through confinement areas

and both situations have potential to impact bacteria concentrations in the Little Powder River. The Little Powder River Watershed Steering Committee is dedicated to providing voluntary and incentive-based alternatives to reduce the amount of bacteria entering surface waters from corrals or feeding pens.

OBJECTIVES

1. Inform agricultural producers of current AFO/CAFO rules and regulations.
2. Provide voluntary and incentive-based alternatives to reduce the amount of bacteria entering surface waters from corrals or feeding pens.

ACTION ITEMS

1. Provide $120,000 for cost share opportunities for producers in the Little Powder River Watershed in an attempt to address 5 corrals, feedlots or animal feeding operations in the next five years.
2. Provide the Landowner Self Assessment form for producers in the Little Powder River for the five years of the watershed plan.

Information and Education – There is a perpetual need to educate the agricultural community regarding water quality issues.

OBJECTIVES

1. Increase the level of understanding of the agricultural community regarding water quality rules and regulations and Campbell County's watersheds.

ACTION ITEMS

1. Provide booth space and an attendant, on an annual basis, for the five years of the watershed plan, at the Campbell County Fair with water quality educational materials available for attendees.
2. Include water quality information with conservation tours directed at agricultural producers. CCCD will host 3 conservation tours during the five years of the watershed plan that includes water quality information.
3. Host 10 workshops during the five years of the watershed plan addressing various topics regarding conservation in agriculture. Water quality will be a specific topic addressed at each of the hosted workshops.
4. Include an update of water quality issues of CCCD on a bi-monthly basis in the district's newsletter throughout the five years of the watershed plan.

ECONOMIC IMPACTS OF REMEDIATION - Remediation should not place an undue economic burden on those who participate in BMP programs.

OBJECTIVES

1. Inform agricultural producers within the Little Powder River of cost sharing opportunities available for implementation of BMPs with potential to improve water quality.

ACTION ITEMS

1. Include announcements for cost share opportunities in the CCCD Newsletter on a bi-monthly basis for the five years of the watershed plan.
2. Include announcements for cost share opportunities in the FSA Newsletter on a quarterly basis for the five years of the watershed plan.
3. Advertise cost share opportunities in the local newspaper on an annual basis, or as needed for the five years of the watershed plan.
4. Provide special mailing to residents of the Little Powder River Watershed announcing new program availability on an annual basis for the five years of the watershed plan.

RURAL AREAS - Development in rural areas has a potential impact on water resources within the Little Powder River Watershed.

Small Acre Land Management –There may be more subdivision of larger tracts in the future and the impact on water quality will have to be considered.

OBJECTIVES

1. Offer educational opportunities to residents of rural areas emphasizing the correlation between proper forage utilization and water quality.

ACTION ITEMS

1. Produce "Living on a Few Acres" brochure to illustrate differences in lifestyle and expectations between living within a municipality and in a rural area where all services are not available. This brochure will be widely available.
2. Produce a brochure to illustrate how much land and supplemental feed is needed to responsibly sustain horses or other livestock specific to different range sites within Campbell County. These brochures will be widely available at places such as veterinary clinics, feed stores, real estate offices, chamber of commerce etc.
3. CCCD subscribes to 200 copies of "Barnyards to Backyards" that will be distributed to local businesses, government entities and selected residents of Campbell County. This activity will continue on a quarterly basis for the five years of this watershed plan.
4. CCCD will host a small acreage workshop at least once during the five years of this plan.
5. CCCD will host a plant identification workshop aimed at grazing management during 2006.
6. CCCD will sponsor a tour to the Bridger Plant Materials Center open to all residents that will highlight seed species available for rangeland improvement or reclamation activities in 2006.

Septic Systems – Most of the rural residents within the watershed rely on septic systems for household sewage treatment. Many of these systems have not been renovated and may be contributing bacteria to Little Powder River. There is a significant amount of information and education to be done as well as installation of operational septic systems. There have been multiple inquiries regarding septic

systems that are newer than the NPS Task Force date of July 1, 1973. Many more septic systems could be remediated if funding is not contingent upon this date.

OBJECTIVES

1. Increase resident's understanding of proper installation and maintenance of individual septic systems.
2. Decrease bacteria concentration in the Little Powder River through remediation of septic systems.

ACTION ITEMS

1. The "Wyoming Homeowner's Guide to Septic Systems" will be available at the CCCD office and distributed as needed for information purposes and in applying for cost share funding.
2. Host a septic workshop highlighting proper installation, maintenance and also including information needed for application for cost-share assistance.
3. CCCD will approach the Campbell County Commissioner's in an effort to offer alternatives for cost-share funding for those septic systems that were installed after 1973, but still may be causing a water quality concern.
4. CCCD will remediate 20 septic systems within the Little Powder River Watershed. There is $85,000 currently available for cost sharing.

WILDLIFE - Whitetail, deer, antelope, small mammals, upland game birds and waterfowl are all contributors of bacteria to Little Powder River. Wildlife distribution may be indirectly improved through grazing management practices such as off-site development of water.

OBJECTIVE

1. Recognize wildlife as a contributor to bacteria concentration in the Little Powder River and may limit compliance with water quality criteria.

ACTION ITEMS

1. At the end of the five-year implementation period of this watershed plan, approach the Wyoming Game and Fish Department to analyze current and historic populations for wildlife and past population trends. This activity will only be necessary if the other activities outlined in this plan do not result in delisting the Little Powder River.

WATER QUALITY MONITORING - Continuing water quality monitoring is important to gain insight into data trends in response to changing climatic conditions and management decisions. A tremendous amount of data must be collected to determine the natural background conditions for the watersheds. As this watershed plan is implemented, sampling sites and dates may change in response to management activities or trends noticed in the data. For these reasons, the steering committee believes that local expertise in water quality issues is also important. Therefore, water quality training for CCCD employees is a priority.

OBJECTIVES

1. Collect credible water quality data in an effort to assess the effectiveness of implementation activities and continue to gain insight into the natural influences on bacteria concentrations.
2. Ensure that CCCD employees have the training and equipment to collect credible water quality data.
3. Ensure that there is sufficient data in order to draw responsible conclusions and properly classify the Little Powder River.
4. Ensure that sample site location, sample frequency and sample collection timing are adequate.

ACTION ITEMS

1. Collect data, including E. coli/total coliform, fecal coliform, electrical conductivity, total dissolved solids, total suspended solids, nitrate and nitrite, total phosphorus sulfate and ammonia at least twice a year for the five years of the watershed plan.
2. CCCD employees will attend at least one water quality training session per year for the five years of the watershed plan.
3. Annually review the District's SAP for adequacy and change when necessary.

DESIGNATED USE CLASSIFICATION – Little Powder River is an intermittent stream and a UAA should be pursued to reflect the actual risk of ingestion. Little Powder River is a small stream, characterized by mostly boggy areas with limited recreation potential as 75% of the watershed is privately owned, with no recreation areas. If WYDEQ's Chapter One, Water Quality Rules and Regulations are revised to include a secondary contact recreation criteria, this classification may more accurately reflect the Little Powder River.

OBJECTIVES

1. Ensure that Little Powder River is classified correctly with regards to primary or secondary recreation use designations.

ACTION ITEMS

1. If data indicates, submit a Use Attainability Analysis (UAA) to change the recreation use designation from primary contact recreation to secondary contact recreation for Little Powder River.

INTERSTATE ISSUES AND COORDINATION WITH OTHER ENTITIES - Powder River County Conservation District in Montana has not done any monitoring to this point. Montana DEQ did some monitoring, but they found no impaired segments. There may be some watershed planning activities set to begin in Powder River Conservation District and they might be able to use this plan as a template for their own. DEQ, NRCS and other entities will need to be kept up to date as to the progress of this watershed plan.

OBJECTIVES

1. Keep WDEQ and other agencies updated on the status of this watershed plan.

ACTION ITEMS

1. CCCD will coordinate with WDEQ by providing an annual updated milestone table and a brief summary of activities regarding this watershed plan. This update will be available to other interested entities as well.
2. Document the implementation of this watershed plan and make available to the conservation district in Montana and to WDEQ.

MILESTONE TABLE

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Continue to monitor water quality for discharged water from CBM wells by sampling for additional parameters.			X	X		X	X	X		X	X	X		X	X	X		X	X	X
Completed			X	X																
CCCD and the City of Gillette will co-host a Stormwater Pollution Prevention Plan workshop to inform industry of the process for obtaining and implementing the plans.							X													
Completed																				
Annually announce availability of cost-share funds for living snow fence installation through the CCCD Newsletter and website.				X				X				X				X				X
Completed																				
Annually include an article in the CCCD Newsletter highlighting living snow fences and their benefits.				X				X				X				X				X
Completed																				
Host a dust mitigation workshop in conjunction with Campbell County Commissioners.						X														
Completed																				

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Meet at least annually with the Campbell County Road and Bridge Superintendent to discuss improvement activities.			X				X				X				X				X	
Completed																				
Host at least one reclamation workshop including a tour within the next five years to emphasize and promote the benefits of proper reclamation efforts.										X										
Completed																				
The district will continue to provide the Aer-way Aerator for rent to producers wishing to increase infiltration and vegetative cover while reducing soil erosion.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																
Implement prescribed grazing management on 100,000 acres in the next five years. The management plan should include provisions for rangeland monitoring and schedules for pasture usage and rest, etc.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Install three grazing BMPs per year for the five years of the watershed plan. Grazing BMPs, according to WDEQ's Nonpoint Source Management Plan, include: Proper Grazing; Fencing; Livestock Herding; Access Roads; Water Development; Land Treatment; Weed and Pest Management; and Windbreaks.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																
CCCD will host a rangeland plant identification workshop during 2006.			X																	
Completed			X																	
Provide $120,000 for cost share opportunities for producers in the Little Powder River Watershed in an attempt to address 5 corrals, feedlots or animal feeding operations in the next five years.	X	X	X	X																
Completed	X	X	X	X																
Provide the Landowner Self Assessment form for producers in the Little Powder River for the five years of the watershed plan.																				
Completed																				
Provide booth space and an attendant, on an annual basis, for the five years of the watershed plan, at the Campbell County Fair with water quality educational materials available for attendees.			X				X				X				X				X	
Completed			X																	

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Include water quality information with conservation tours directed at agricultural producers. CCCD will host 3 conservation tours during the five years of the watershed plan that includes water quality information.							X				X				X					
Completed																				
Host 10 workshops during the five years of the watershed plan addressing various topics regarding conservation in agriculture. Water quality will be a specific topic addressed at each of the hosted workshops.					X	X			X	X			X	X			X	X		
Completed																				
Include an update of water quality issues of CCCD on a bi-monthly basis in the district's newsletter throughout the five years of the watershed plan.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																
Include announcements for cost share opportunities in the CCCD Newsletter on a bi-monthly basis for the five years of the watershed plan.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Include announcements for cost share opportunities in the FSA Newsletter on a quarterly basis for the five years of the watershed plan.					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed																				
Advertise cost share opportunities in the local newspaper on an annual basis, or as needed for the five years of the watershed plan.	X				X				X				X				X			
Completed	X																			
Provide special mailing to residents of the Little Powder River Watershed announcing new program availability on an annual basis for the five years of the watershed plan.				X				X				X				X				X
Completed																				
Produce "Living on a Few Acres" brochure to illustrate differences in lifestyle and expectations between living within a municipality and in a rural area where all services are not available. This brochure will be widely available.								X												
Completed																				

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Produce a brochure to illustrate how much land and supplemental feed is needed to responsibly sustain horses or other livestock specific to different range sites within Campbell County. These brochures will be widely available at places such as veterinary clinics, feed stores, real estate offices, chamber of commerce etc.									X											
Completed																				
CCCD subscribes to 200 copies of "Barnyards to Backyards" that will be distributed to local businesses, government entities and selected residents of Campbell County. This activity will continue on a quarterly basis for the five years of this watershed plan.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																
CCCD will host a small acreage workshop at least once during the five years of this plan.						X				X										
Completed																				
CCCD will host a plant identification workshop aimed at grazing management during 2006.			X																	
Completed			X																	

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
CCCD will sponsor a tour to the Bridger Plant Materials Center open to all residents that will highlight seed species available for rangeland improvement or reclamation activities in 2006.		X																		
Completed		X																		
The "Wyoming Homeowner's Guide to Septic Systems" will be available at the CCCD office and distributed as needed for information purposes and in applying for cost share funding.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed	X	X	X	X																
Host a septic workshop highlighting proper installation, maintenance and also including information needed for application for cost-share assistance.								X												
Completed																				
CCCD will approach the Campbell County Commissioner's in an effort to offer alternatives for cost-share funding for those septic systems that were installed after 1973, but still may be causing a water quality concern.				X																
Completed					X															

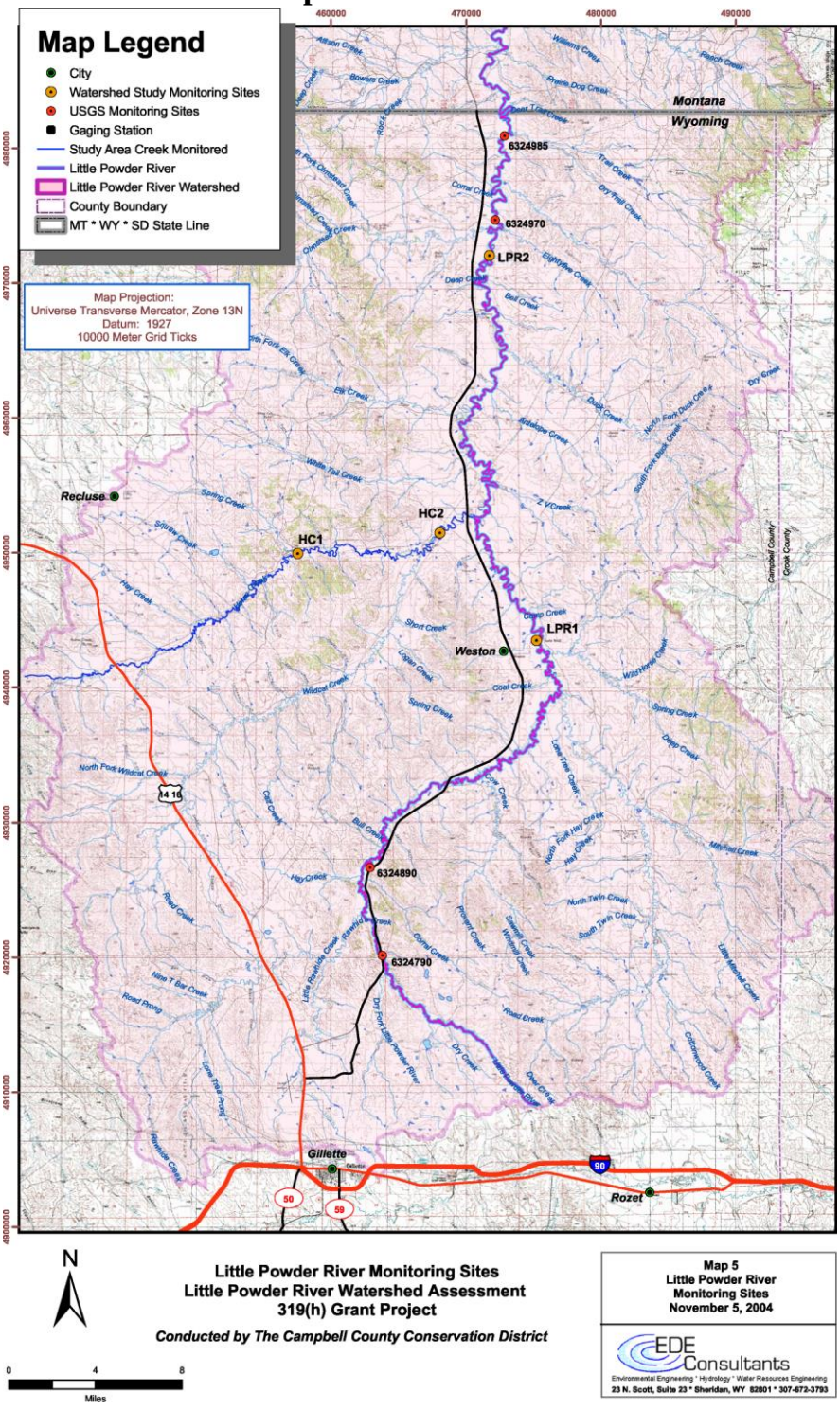
MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
CCCD will remediate 20 septic systems within the Little Powder River Watershed. There is $85,000 currently available for cost sharing.	X	X	X	X																
Completed	X	X	X	X																
At the end of the five-year implementation period of this watershed plan, approach the Wyoming Game and Fish Department to analyze current and historic populations for wildlife and past population trends. This activity will only be necessary if the other activities outlined in this plan do not result in delisting the Little Powder River.																				X
Completed																				
Collect data, including E. coli/total coliform, fecal coliform, electrical conductivity, total dissolved solids, total suspended solids, nitrate and nitrite, total phosphorus sulfate and ammonia at least twice a year for the five years of the watershed plan.		X	X	X		X	X	X		X	X	X		X	X	X		X	X	X
Completed		X	X	X																
CCCD employees will attend at least one water quality training session per year for the five years of the watershed plan.						X				X				X				X		
Completed Annually review the District's SAP for adequacy and change when necessary **Completed**				X X				X				X				X				X

MILESTONE TABLE	2006				2007				2008				2009				2010			
Action Items	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
If data indicates, submit a Use Attainability Analysis (UAA) to change the recreation use designation from primary contact recreation to secondary contact recreation for Little Powder River							X													
Completed																				
CCCD will coordinate with WDEQ by providing an annual updated milestone table and a brief summary of activities regarding this watershed plan. This update will be available to other interested entities as well.								X				X				X				X
Completed																				
Document the implementation of this watershed plan and make available to the conservation district in Montana and to WDEQ.					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Completed																				

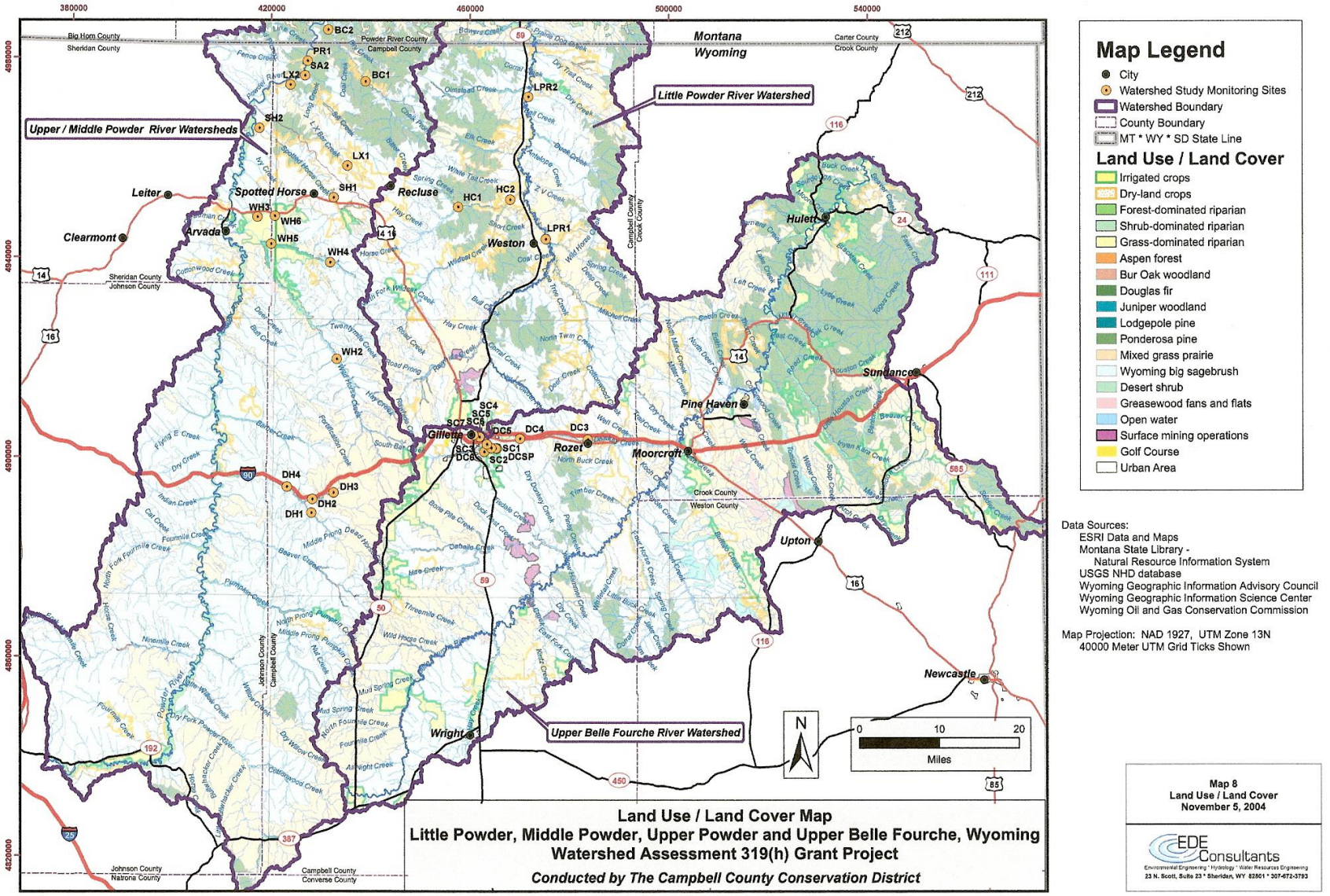
Appendix A
Use Classification Table

Class	Drinking Water	Game Fish	Non-Game Fish	Fish Consumption	Other Aquatic Life	Recreation	Wildlife	Agriculture	Industry	Scenic Value
2AB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2A	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2B	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2C	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3A	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3B	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3C	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
4A	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
4B	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
4C	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes

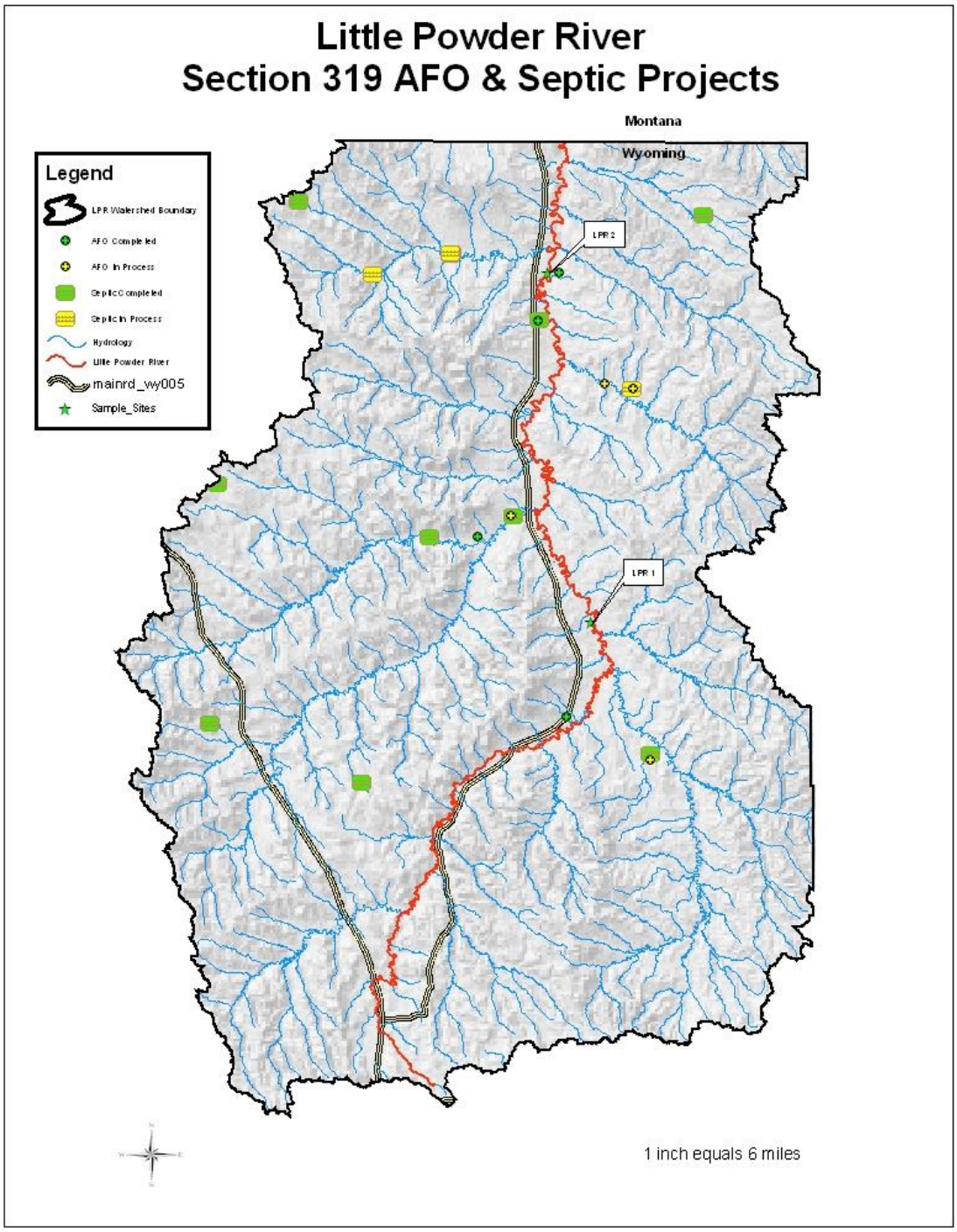
Appendix B – Watershed Maps



Land Use-Land Cover Map



Projects Implemented through Section 319 Project



APPENDIX C - RAW DATA

LPR1 Water Quality Data

Site	Date	Time	Air Temp	YSI	YSI - PH	LAB – PH	COND - YSI	COND-LAB	DO	DO%SAT
	(mmddyy)	(military)	° C	Temp (°C)		(SU)	(umho/cm)	(umho/cm)	(mg/L)	%
LPR1	4/24/2002	14:00	9° C	8.86	7.94	8.33	2130	2940	0.43	3.70
LPR1	5/2/2002	10:00	14° C	9.13	7.93	7.95	2565	2380		
LPR1	5/8/2002	10:00	3° C			8.36		3190		
LPR1	5/15/2002	10:45	16° C	15.98	8.19	8.37	4209	4060	4.54	47.80
LPR1	5/20/2002	9:40	14° C	13.20	8.27	8.45	4298	4230	9.97	97.00
LPR1	9/19/2002	15:05	22° C	17.91	8.41	8.50	3039	2900	44.10	124.90
LPR1	9/24/2002	15:15	15° C	15.57	8.53	8.60	3115	2980	42.00	134.50
LPR1	9/30/2002	15:00	16° C	15.47	8.55	8.40	3266	3060	36.90	139.10
LPR1	10/9/2002	14:30	23° C	13.36	8.36	8.40	3526	3250	28.80	119.80
LPR1	10/15/2002	14:55	13° C	9.55	8.43	8.30	4010	3770	23.70	105.50
LPR1	4/17/2003	10:00	17° C	10.59	7.89	8.30	5065	4720	32.90	74.20
LPR1	4/24/2003	12:25	12° C	12.64	8.03	8.30	4072	3860	58.40	69.90
LPR1	5/1/2003	12:55	6° C	9.03	7.98	8.40	4384	4120	56.30	89.10
LPR1	5/7/2003	16:30	12° C	14.12	8.21	8.40	2837	2670	57.40	112.10
LPR1	5/14/2003	13:40	27° C	18.21	8.24	8.40	2624	2430	55.30	113.20
LPR1	8/12/2003	11:30								
LPR1	9/17/2003	11:35	2° C	10.93	8.36	8.30	1388	1400	8.37	78.00
LPR1	9/23/2003	11:05	25° C	12.28	8.05	8.50	1992	1990	10.62	99.80
LPR1	10/1/2003	13:00	19° C	12.02	8.00	8.40	2276	2440	11.40	107.30
LPR1	10/8/2003	11:50	20° C	11.94	8.00	8.30	2484	2540	11.56	108.00
LPR1	10/15/2003	12:45	14° C	10.41	8.21	8.40	2497	2540	12.21	110.20
Average				12.69	8.19	8.37	3146.16	3073.50	8.64	81.48
Geomea				12.39	8.19	8.37	2996.273	2959.28	6.39	60.11
St. Deviation				2.90	0.21	0.13	978.2032	837.45	4.12	37.73
Minimum				8.86	7.89	7.95	1388.00	1400.00	0.43	3.70
Maximum				18.21	8.55	8.60	5065.00	4720.00	12.21	110.20
Count				19	19	20	19	20	8	8

LPR1 Water Quality Data Cont...

Site	Date	BARO	DISCH	E_COLI	F_COLIF	T_COLIF	TURB	ALK	BICAR	CAR
	(mmddyy)		(cfs)	(#/100mL)	(#/100mL)	(#/100mL)	(NTU)	(mg/L)	(mg/L)	(mg/L)
LPR1	4/24/2002		1.550		30		54.42	340	414	
LPR1	5/2/2002				240		33.63	252	308	
LPR1	5/8/2002				30		83.09	365	445	
LPR1	5/15/2002				30		66.69	465	567	
LPR1	5/20/2002				140		69.72	495	603	
LPR1	9/19/2002	668.80	0.00	20.00	1	110	64.89	427	488	16.2
LPR1	9/24/2002	668.30	0.46	1	1	1	48.36	428	475	23.1
LPR1	9/30/2002	662.60	0.46	1	1	30	40.08	440	507	14.4
LPR1	10/9/2002	668.40	0.71	1	1	1		464	539	13.2
LPR1	10/15/2002	666.00	0.80	1	1	1	29.00	393	480	0.5
LPR1	4/17/2003	661.70	1.81	10.00	6	70	54.90	626	745	
LPR1	4/24/2003	658.90	0.87	10	10	2430	55.10	519	611	
LPR1	5/1/2003	663.20	5.51	30	46	1100	37.40	484	566	
LPR1	5/7/2003	656.10	2.72	60	180	160	71.50	311	361	
LPR1	5/14/2003	672.20	2.30	190	120	930	181.00	309	364	
LPR1	8/12/2003		0.04	98	98	150000		444		
LPR1	9/17/2003	660.30	0.10	350	390	4000	189.50	242	287	
LPR1	9/23/2003	663.00	0.04	67	80	30000	62.30	334	382	
LPR1	10/1/2003	675.50	0.04	52	52	30000	43.30	425	497	
LPR1	10/8/2003	664.00	0.04	5	5	23	45.90	442	538	
LPR1	10/15/2003	667.10	0.14	12	13	20000	23.80	450	528	
Average		665.07	1.03	56.75	70.24	14928.50	66.03	412.14	485.25	13.48
Geomean		665.05	0.29	14.73	18.78	332.96	56.74	401.82	472.61	8.13
St. Deviation		5.12	1.43	92.78	99.08	37557.3	44.80	91.86	111.64	8.21
Minimum		656.10	0.00	1.00	1.00	1.00	23.80	242.00	287.00	0.50
Maximum		675.50	5.51	350.00	390.00	150000.00	189.50	626.00	745.00	23.10
Count		15	17	16	21	16	19	21	20	5

LPR1 Water Quality Data Cont...

Site	Date	T_CL	T_HARD	T_FLUOR	T_SULF	T_CYAN	T_PHEN	RA226	RA226P	TPH
	(mmddyy)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(ug/L)	(ug/L)	(pCi/L)	±	(mg/L)
LPR1	4/24/2002	102	710.00	0.7	1200	2.5	5	0.9	0.3	<1
LPR1	5/2/2002	111	399.00	0.7	829	2.5	5	1	0.2	<1
LPR1	5/8/2002	106	632.00	0.9	1280	2.5	5	1	0.4	<1
LPR1	5/15/2002	142	723.00	0.9	1620	2.5	5	<0.2		<1
LPR1	5/20/2002	142	660.00	1	1710	2.5	5	0.7	0.3	<1
LPR1	9/19/2002	91.3	360.00	1.01	906	2.5	20	<0.2		<1
LPR1	9/24/2002	110	403.00	0.93	916	2.5	5	0.2	0.02	<1
LPR1	9/30/2002	126	443.00	0.86	979	2.5	5	<0.2		<1
LPR1	10/9/2002	170	535.00	0.87	1200	2.5	5	0.95	0.19	<1
LPR1	10/15/2002	340	640.00	1.01	1150	2.5	5	1.16	0.17	<1
LPR1	4/17/2003	204	883.00	1.04	1900	2.5	30	0.33	0.33	<1
LPR1	4/24/2003	136	834.54	0.89	1490	2.5	5	<0.2		<1
LPR1	5/1/2003	212	857.00	0.97	1590	2.5	20	<0.2L		<1
LPR1	5/7/2003	110	592.43	0.74	964	2.5	20	<0.2L		<1
LPR1	5/14/2003	88	405.10	0.62	840	2.5	20	0.26	0.31	<1
LPR1	8/12/2003	61.7	457.00		1210					
LPR1	9/17/2003	13.4	202.22	0.54	424	2.5	5	0.42	0.26	<1
LPR1	9/23/2003	19.4	280.65	0.66	647	2.5	5	0.26	0.19	<1
LPR1	10/1/2003	19.4	314.17	0.78	684	2.5	5	0.24	0.2	<1
LPR1	10/8/2003	21.5	381.30	0.78	765	2.5	5	<0.2		<1
LPR1	10/15/2003	21.4	411.40	0.87	816	2.5	5	<0.2		<1
Average		111.77	529.71	0.84	1100.95	2.50	9.25	*0.62	0.24	
Geomean		81.72	493.63	0.83	1034.61	2.5	7.22	*0.51	0.20	
St. Deviation		78.52	197.52	0.14	388.30	0	7.83	*0.37	0.099	
Minimum		13.40	202.22	0.54	424.00	2.50	5.00	*0.20	0.02	
Maximum		340.00	883.00	1.04	1900.00	2.50	30.00	*1.16	0.40	
Count		21	21	20	21	20	20	*12	12	

LPR1 Water Quality Data Cont...

Site	Date	D_CAL	S-MAG	D_POT	D_SOD	D_BOR	D_CD	D_CR	D_CU	D_FE
	(mmddyy)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)
LPR1	4/24/2002	150	83	21	390	350	<0.1	<1	5	460
LPR1	5/2/2002	80	48	14	350	120	<0.1	<1	6	61
LPR1	5/8/2002	130	77	20	470	260	<0.1	<1	5	<30
LPR1	5/15/2002	130	97	22	710	280	<0.1	<1	2	<200
LPR1	5/20/2002	110	93	20	720	300	<0.1	1	4	<200
LPR1	9/19/2002	60.9	50.5	14.4	528	200	<0.2	<1	0.5	<30
LPR1	9/24/2002	65.4	58.3	16.7	510	200	<0.2	<1	0.5	<30
LPR1	9/30/2002	72.8	63.5	19.2	522	200	<0.2	<1	0.5	<30
LPR1	10/9/2002	90.2	75.3	20.7	610	300	<0.2	<1	3	<30
LPR1	10/15/2002	122	81.5	27.6	665	400	<0.2	<1	2	<30
LPR1	4/17/2003	151	123	28	879	400	<0.3	<1	2	<30
LPR1	4/24/2003	158	107	24.3	660	300	<0.3	<1	0.5	<30
LPR1	5/1/2003	167	107	24.8	698	400	<0.3	<1	0.5	<30
LPR1	5/7/2003	121	70.6	22.2	366	400	<0.2	<1	4	<30
LPR1	5/14/2003	76.1	52.3	13.1	405	200	<0.1	<1	2	<30
LPR1	8/12/2003									
LPR1	9/17/2003	44.6	22.1	8.8	226	70	<0.1	1	3	450
LPR1	9/23/2003	56.9	33.7	9.8	333	100	<1	<1	2	40
LPR1	10/1/2003	61.1	39.3	9.9	406	100	<0.2	<1	0.5	<30
LPR1	10/8/2003	72.5	48.7	11.3	417	100	<0.1	<1	0.5	<30
LPR1	10/15/2003	81.1	50.8	11.5	399	100	<0.1	<1	1	<30
Average		100.03	69.08	17.97	513.20	239.00		*1.00	2.23	*252.75
Geomean		93.07	63.66	16.92	487.32	208.31		*1	1.54	*149.91
St. Deviation		38.30	27.05	6.05	166.94	115.94		*0	1.77	*233.73
Minimum		44.60	22.10	8.80	226.00	70.00		*1.00	0.50	*40.00
Maximum		167.00	123.00	28.00	879.00	400.00		*1.00	6.00	*460.00
Count		20	20	20	20	20		*2	20	*4

LPR1 Water Quality Data Cont...

Site	Date	D_PB	D_MN	D_HG	D_NI	D_SI	D_ZN	T_ANT	T_AS	T_BA
	(mmddyy)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)
LPR1	4/24/2002	<2	290	<.06	12	<3	<10	<5	1.1	<100
LPR1	5/2/2002	<2	140	<.06	<10	<3	43	<5	2.4	<100
LPR1	5/8/2002	<2	190	<.06	<10	<3	27	<5	1.1	<100
LPR1	5/15/2002	<2	240	<.06	<10	<3	<50	<5	1.7	<100
LPR1	5/20/2002	<2	130	<.06	<10	<3	26	<5	1.5	
LPR1	9/19/2002	<2	30	<.06	<10	<3	<10	<5	0.5	<100
LPR1	9/24/2002	<2	40	<.06	<10	<3	<10	<5	0.5	<100
LPR1	9/30/2002	<2	20	<.06	<10	<3	<10	<5	0.5	<100
LPR1	10/9/2002	<2	40	<.06	10	<3	<10	<5	3	<100
LPR1	10/15/2002	<2	40	<.06	<10	<3	<10	<5	3	<100
LPR1	4/17/2003	<2	160	<.06	<10	<3	<10	<5	0.5	<100
LPR1	4/24/2003	<2	120	<.06	<10	<3	<10	<5	1	<100
LPR1	5/1/2003	<2	90	<.06	<10	<3	<10	<5	0.5	<100
LPR1	5/7/2003	<2	20	<.06	<10	<3	<10	<5	0.5	<100
LPR1	5/14/2003	<2	90	<.06	<10	<3	<10	<5	0.5	<100
LPR1	8/12/2003									
LPR1	9/17/2003	<2	50	<.06	<10	<3	<10	<5	2	<100
LPR1	9/23/2003	<2	20	<.06	<10	<3	<10	<5	0.5	<100
LPR1	10/1/2003	<2	30	<.06	<10	<3	<10	<5	0.5	<100
LPR1	10/8/2003	<2	30	<.06	<10	<3	<10	<5	0.5	<100
LPR1	10/15/2003	<2	30	<.06	<10	<3	<10	<5	0.5	<100
Average			90.00		*11.00		*32.00		1.12	
Geomean			62.30		*10.95		*31.14		0.87	
St. Deviation			79.67		*1.41		9.54		0.86	
Minimum			20.00		*10.00		26.00		0.50	
Maximum			290.00		*12.00		43.00		3.00	
Count			20		*2		3		20	

* Calculated from detected values, non-detect values would result in lower numbers than those shown.

LPR1 Water Quality Data Cont...

Site	Date	T_BE	T_FE	T_MN	TI	T_AL	T_SE	TSS	TDS	SAR
	(mmddyy)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(mg/L)	(mg/L)	
LPR1	4/24/2002	0.03	900	300	5	1800	<5			6.3
LPR1	5/2/2002	0.29	5200	170	5	3800	<5		1680	7.7
LPR1	5/8/2002	0.09	1600	230	5	1600	<5		2340	8.1
LPR1	5/15/2002	0.09	1700	280	5	1300	<5		3090	11.5
LPR1	5/20/2002	0.1	1900	270	5	1400	<5		3230	12.2
LPR1	9/19/2002	<0.9	900	130	5	490	<5		2180	12.1
LPR1	9/24/2002	2.1	580	60	5	320	<5		2180	11.1
LPR1	9/30/2002	<0.9	490	60	5	280	<5		2300	10.8
LPR1	10/9/2002	<0.9	510	60	5	290	<5		2420	11.5
LPR1	10/15/2002	<0.9	490	50	5	290	<5		2760	11.4
LPR1	4/17/2003	<0.9	1080	220	5	970	<5		3950	12.9
LPR1	4/24/2003	<0.9	1060	200	5	1100	<5		3140	9.9
LPR1	5/1/2003	<0.9	780	150	5	730	<5		3330	10.4
LPR1	5/7/2003	<0.9	1050	110	5	1360	6		2080	6.5
LPR1	5/14/2003	<0.9	2180	140	5	2880	<5		1860	8.8
LPR1	8/12/2003				5			110		
LPR1	9/17/2003	<0.9	1780	60	5	2460	<5		960	6.9
LPR1	9/23/2003	<0.9	840	50	5	1280	<5		1360	8.7
LPR1	10/1/2003	<0.9	660	50	5	1000	<5		1560	10
LPR1	10/8/2003	<0.9	670	50	5	980	<5		1780	9.3
LPR1	10/15/2003	<0.9	430	40	5	550	<5		1710	8.6
Average		*0.45	1240.00	134.00	5.00	1244.00	*6.00	110.00	2311.05	9.74
Geomean		*0.16	994.66	106.90	5	952.87	*6	110	2185.89	9.53
St. Deviation		*0.81	1069.71	88.70	0	926.48			771.14	1.98
Minimum		*0.03	430.00	40.00	5.00	280.00	*6.00	110.00	960.00	6.30
Maximum		*2.10	5200.00	300.00	5.00	3800.00	*6.00	110.00	3950.00	12.90
Count		*6	20	20	21	20	*1	1	19	20

LPR2 Water Quality Data

Site	Date	Time	Air Temp	YSI	YSI - PH	LAB – PH	COND - YSI	COND-LAB	DO	DO%SAT
	(mmddyy)	(military)	° C	Temp (°C)		(SU)	(umho/cm)	(umho/cm)	(mg/L)	%
LPR2	5/2/2002	11:30	18° C	9.13	7.93	8.25	2565	3250		
LPR2	5/8/2002	11:00	2° C			8.31		3560		
LPR2	5/15/2002	9:45	17° C	15.70	8.00	8.19	3947	3640	8.03	80.50
LPR2	5/20/2002	10:35	14° C	14.41	8.08	8.31	3749	3790	9.73	97.20
LPR2	5/22/2002	10:30	7° C			8.08		3800		
LPR2	9/19/2002	13:20	22° C	15.76	8.03	8.20	3419	3300	42.00	114.80
LPR2	9/24/2002	14:15	17° C	15.94	8.13	8.20	3492	3380	40.00	114.90
LPR2	9/30/2002	13:50	16° C	16.70	8.12	8.20	3423	3170	36.90	113.20
LPR2-New	4/17/2003	13:40	17° C	14.52	8.37	8.40	3048	2840	33.90	96.40
LPR2	4/24/2003	9:50	10° C	14.34	8.02	8.40	3184	2950	60.40	75.20
LPR2	5/1/2003	10:25	4° C	8.65	8.03	8.40	3126	2920	52.30	85.40
LPR2	5/7/2003	14:45	15° C	15.64	8.28	8.50	3320	3140	56.30	99.20
LPR2	5/14/2003	11:25	21° C	15.51	8.01	8.20	1235	1140	52.30	85.70
Average				14.21	8.09	8.28	3137.09	3144.62	8.88	88.85
Geomea				13.91	8.09	8.28	3023.388	3038.03	8.84	88.46
St. Deviation				2.73	0.13	0.12	728.4584	680.37	1.20	11.81
Minimum				8.65	7.93	8.08	1235.00	1140.00	8.03	80.50
Maximum				16.70	8.37	8.50	3947.00	3800.00	9.73	97.20
Count				11	11	13	11	13	2	2

LPR2 Water Quality Data Cont...

Site	Date	BARO	DISCH	E_COLI	F_COLIF	T_COLIF	TURB	ALK	BICAR	CAR
	(mmddyy)		(cfs)	(#/100mL)	(#/100mL)	(#/100mL)	(NTU)	(mg/L)	(mg/L)	(mg/L)
LPR2	5/2/2002			Present	40	Present	33.63	340	414	0.5
LPR2	5/8/2002			Present	1200	Present	76.98	360	439	0.5
LPR2	5/15/2002			Present	580	Present	102.60	370	451	0.5
LPR2	5/20/2002			Present	570	Present	80.19	355	433	0.5
LPR2	5/22/2002			Present	540	Present	104.40	335	408	0.5
LPR2	9/19/2002	673.30		1.00	1.00	18	16.50	206	251	0.5
LPR2	9/24/2002	676.20	1.34	1.00	1.00	1.00	18.90	198	242	0.5
LPR2	9/30/2002	675.10	1.36	1.00	1.00	1.00	17.91	194	236	0.5
LPR2-New	4/17/2003	666.70	4.72	10.00	40	210	98.50	490	563	
LPR2	4/24/2003	663.80	2.85	260.00	307	2240	89.40	459	530	
LPR2	5/1/2003	669.60	4.90	530.00	1050	1540	48.60	392	452	
LPR2	5/7/2003	668.90	8.73	90.00	120	260	111.30	400	452	
LPR2	5/14/2003	677.60	16.94	2400.00	1400	7200	1087.00	172	209	
Average		671.40	5.83	411.63	450.00	1433.75	145.07	328.54	390.77	0.50
Geomean		671.38	4.04	27.18	87.85	111.80	67.83	311.36	372.35	0.5
St. Deviation		4.90	5.52	824.73	494.53	2475.48	285.23	104.27	116.83	0
Minimum		663.80	1.34	1.00	1.00	1.00	16.50	172.00	209.00	0.50
Maximum		677.60	16.94	2400.00	1400.00	7200.00	1087.00	490.00	563.00	0.50
Count		8	7	8	13	8	13	13	13	8

LPR2 Water Quality Data Cont...

Site	Date	T_CL	T_HARD	T_FLUOR	T_SULF	T_CYAN	T_PHEN	RA226	RA226P	TPH
	(mmddyy)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(ug/L)	(ug/L)	(pCi/L)	±	(mg/L)
LPR2	5/2/2002	92	998.00	1.2	1610	2.5	5	<0.2		<1
LPR2	5/8/2002	94	917.00	1.1	1590	2.5	5	<0.2		<1
LPR2	5/15/2002	113	1110.00	1.2	1770	2.5	5	<0.2		<1
LPR2	5/20/2002	102	1070.00	1.3	1770	2.5	5	0.5	0.02	<1
LPR2	5/22/2002	103	1080.00	1.2	1750	2.5	5	<0.2		<1
LPR2	9/19/2002	132	1410.00	2.68	1540	2.5	5	0.67	0.07	<1
LPR2	9/24/2002	137	1350.00	2.8	1560	2.5	5	0.58	0.06	<1
LPR2	9/30/2002	135	1430.00	2.71	1550	2.5	5	0.39	0.08	<1
LPR2-New	4/17/2003	18.4	773.00	0.65	1130	2.5	20	<0.2		<1
LPR2	4/24/2003	30	812.57	0.69	1270	2.5	5	0.21	0.3	<1
LPR2	5/1/2003	24	789.76	0.67	1240	2.5	5	<0.2		<1
LPR2	5/7/2003	59.7	642.28	0.71	1280	2.5	20	<0.2		<1
LPR2	5/14/2003	9.7	267.09	0.42	405	2.5	10	0.33	0.33	<1
Average		80.75	973.05	1.33	1420.38	2.50	7.69	*0.45	0.14	
Geomean		61.81	904.68	1.12	1347.33	2.5	6.53	*0.42	0.09	
St. Deviation		46.72	328.17	0.84	371.78	0	5.63	*0.17	0.13	
Minimum		9.70	267.09	0.42	405.00	2.50	5.00	*0.21	0.02	
Maximum		137.00	1430.00	2.80	1770.00	2.50	20.00	*0.67	0.33	
Count		13	13	13	13	13	13	*6	6	

LPR2 Water Quality Data Cont...

Site	Date	D_CAL	S-MAG	D_POT	D_SOD	D_BOR	D_CD	D_CR	D_CU	D_FE
	(mmddyy)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)
LPR2	5/2/2002	210	110	27	440	140	0.1	0.5	6	15
LPR2	5/8/2002	190	110	26	460	200	0.1	0.5	4	15
LPR2	5/15/2002	230	130	31	540	230	0.1	0.5	2	15
LPR2	5/20/2002	230	120	33	490	220	0.1	0.5	5	15
LPR2	5/22/2002	230	120	31	470	220	0.1	0.5	4	65
LPR2	9/19/2002	376	114	55.3	267	200	0.1	0.5	2	15
LPR2	9/24/2002	327	130	57.4	252	200	0.1	0.5	1	15
LPR2	9/30/2002	332	146	65.1	254	200	0.1	0.5	1	40
LPR2-New	4/17/2003	120	115	16.3	426	200	0.15	0.5	1	15
LPR2	4/24/2003	136	115	20.5	451	200	0.1	0.5	0.5	15
LPR2	5/1/2003	145	104	17.1	398	200	0.15	0.5	0.5	15
LPR2	5/7/2003	123	81.5	18	502	200	0.1	0.5	3	15
LPR2	5/14/2003	51.3	33.8	9.1	146	100	0.1	0.5	4	40
Average		207.72	109.95	31.29	392.00	193.08	0.10	0.50	2.62	22.69
Geomean		184.93	104.88	27.13	369.71	189.23	0.10	0.5	1.95	19.53
St. Deviation		94.96	27.41	17.47	121.13	34.97	0.02	0	1.84	15.76
Minimum		51.30	33.80	9.10	146.00	100.00	0.05	0.50	0.50	15.00
Maximum		376.00	146.00	65.10	540.00	230.00	0.15	0.50	6.00	65.00
Count		13	13	13	13	13	13	13	13	13

LPR2 Water Quality Data Cont...

Site	Date	D_PB	D_MN	D_HG	D_NI	D_SI	D_ZN	T_ANT	T_AS	T_BA
	(mmddyy)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)
LPR2	5/2/2002	1	340	0.03	13	1.5	5	2.5	0.8	50
LPR2	5/8/2002	1	250	0.03	5	1.5	5	2.5	0.5	50
LPR2	5/15/2002	1	400	0.03	5	1.5	5	2.5	1.9	50
LPR2	5/20/2002	1	340	0.03	5	1.5	13	2.5	0.9	50
LPR2	5/22/2002	1	400	0.03	5	1.5	11	2.5	0.8	50
LPR2	9/19/2002	1	5	0.03	5	1.5	5	2.5	0.5	50
LPR2	9/24/2002	1	20	0.03	5	1.5	5	2.5	0.5	50
LPR2	9/30/2002	1	50	0.03	5	1.5	5	2.5	0.5	50
LPR2-New	4/17/2003	1	70	0.03	5	1.5	5	2.5	0.5	50
LPR2	4/24/2003	1	90	0.03	5	1.5	5	2.5	0.5	50
LPR2	5/1/2003	1	60	0.03	5	1.5	5	2.5	0.5	50
LPR2	5/7/2003	1	5	0.03	5	1.5	5	2.5	0.5	50
LPR2	5/14/2003	1	5	0.03	5	1.5	5	2.5	4	200
Average		1.00	156.54	0.03	5.62	1.50	6.08	2.50	0.95	61.54
Geomean		1	62.42	0.03	5.38	1.5	5.72	2.5	0.73	55.63
St. Deviation		0	161.95	0	2.22	0	2.66	0	0.99	41.60
Minimum		1.00	5.00	0.03	5.00	1.50	5.00	2.50	0.50	50.00
Maximum		1.00	400.00	0.03	13.00	1.50	13.00	2.50	4.00	200.00
Count		13	13	13	13	13	13	13	13	13

LPR2 Water Quality Data Cont...

Site	Date	T_BE	T_FE	T_MN	TI	T_AL	T_SE	TSS	TDS	SAR
	(mmddyy)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(Ug/L)	(mg/L)	(mg/L)	
LPR2	5/2/2002	0.45	1100	370	5	790	2.5		2820	6
LPR2	5/8/2002	0.45	1700	320	5	1300	2.5		2790	6.6
LPR2	5/15/2002	0.2	2500	380	5	1900	2.5		3090	7
LPR2	5/20/2002	0.1	2300	410	5	1700	2.5		3060	6.4
LPR2	5/22/2002	0.14	2700	400	5	2000	2.5		3120	6.2
LPR2	9/19/2002	0.45	270	30	5	270	2.5		2960	3.1
LPR2	9/24/2002	5.3	300	30	5	310	2.5		2930	3
LPR2	9/30/2002	0.45	280	40	5	280	2.5		2910	2.9
LPR2-New	4/17/2003	0.45	1400	190	5	1560	2.5		2390	6.7
LPR2	4/24/2003	0.45	1290	190	5	1500	2.5		2480	6.9
LPR2	5/1/2003	0.45	750	120	5	820	2.5		2430	6.2
LPR2	5/7/2003	0.45	1440	140	5	1740	2.5		2530	8.6
LPR2	5/14/2003	1.8	15200	280	5	19200	2.5		870	3.9
Average		0.86	2402.31	223.08	5.00	2566.92	2.50		2644.62	5.65
Geomean		0.46	1256.81	160.02	5	1193.47	2.5		2542.7	5.34
St. Deviation		1.40	3931.15	145.16	0	5036.76	0		591.64	1.82
Minimum		0.10	270.00	30.00	5.00	270.00	2.50		870.00	2.90
Maximum		5.30	15200.00	410.00	5.00	19200.00	2.50		3120.00	8.60
Count		13	13	13	13	13	13		13	13

APPENDIX D
ACRONYMS

Acronyms

AFO – Animal Feeding Operation
BLM – Bureau of Land Management
BMP – Best Management Practices
CCCD – Campbell County Conservation District
CWA – Clean Water Act
ECP – Emergency Conservation Program
EQIP – Environmental Quality Incentives Program
EPA – US Environmental Protection Agency
FSA – Farm Service Agency
NMP – Nutrient Management Plan
NPS – Non-Point Source
NRCS – Natural Resources Conservation Service
UAA – Use Attainability Analysis
USGS – United State Geological Survey
WACD – Wyoming Association of Conservation Districts
WDEQ- Wyoming Department of Environmental Quality
WQD – Water Quality Department
WYPDES – Wyoming Pollution Discharge Elimination System

APPENDIX E
RESPONSE TO PUBLIC COMMENTS

COMMENTS 1-6
Submitted by WYDEQ:

November 2, 2006

Little Powder River Watershed Steering Committee
c/o Campbell County Conservation District
601 4J Court, Suite D
Gillette, WY 82717

RE: WDEQ comments on Draft Little Powder River Watershed Plan

Dear Committee Members:

Thank you for the opportunity to review this document. Let me start by complementing your efforts and results in this comprehensive document. I have included a few specific comments that I hope will lend additional information and clarity to your document.

General Comment

Some of the recently submitted watershed plans have included more detailed GIS maps, for example: land ownership, land use, soils, etc. These maps lend a higher level of detail which assists in the review of the plan and in future planning efforts. Much of this information is readily available through the NRCS and county planning offices.

RESPONSE:
Additional maps were added to the plan to add to the understanding of the watershed.

Specific Comments

COMMENT 1:
Line 263/264 The graphs on this page have no scale on the x-axis. The legend for the axis indicates that it is time/date, but no scale is evident. This makes understanding the data that is presented rather difficult.

RESPONSE:
Changed as requested.

COMMENT 2:
Line 272 This line states there have been BMPs installed on this segment of the Little Powder River to improve livestock distribution. It is vague as to what section is being referred to and there is no discussion of what types of BMPs have been installed. I feel it is critical for a watershed plan to detail whatever projects have been completed, or started, and to discuss what results that have been realized from those actions, if any. I would suggest adding photos detailing some of the projects so the landowners and the

Conservation District get positive recognition for improved resource management. Showing positive experiences, both in the areas of resources and money, is generally much more effective marketing tool for future projects than simple mailings.

RESPONSE:
Additional information was added to the watershed plan to indicate more specifics regarding past implementation. Photos of two of the AFO projects have been included to illustrate the type of work done to address bacteria concentrations within the watershed.

COMMENT 3:
Line 330 These two paragraphs list types of projects that have been conducted in the watershed. A simple list lacks specificity and gives very little information to the plan. It does indicate that many projects have been completed but gives little or no information to how they may or may not relate to the watershed spatially. A map indicating the project areas could go a long way in future evaluation of success of BMPs and how they improve the water quality in the Little Powder River.

RESPONSE:
A map of installed projects was added to the plan for clarification.

COMMENT 4:
Line 410 There is no reference to the adequacy of the sampling locations to evaluate improvement due to BMP implementation. Does the existing sampling program adequately evaluate the watershed conditions or does it need to be altered or enhanced? Should there not be an annual evaluation of the sampling results and a reevaluation of the appropriateness of the SAP?

RESPONSE:
The Little Powder River Steering Committee talked at length about adequacy of sampling locations and timing of sampling. After discussion, the Little Powder River Steering Committee did decide to increase the number of parameters sampled for to represent water quality better. There is an annual evaluation of results and SAP. This information was added to the action items and milestone table of the plan.

COMMENT 5:
Line 544 This states that there are corrals and feeding pens that are too close to the Little Powder River. How was the number of 5 corrals determined to be appropriate number that will contribute to the delisting of the river? I would propose that an evaluation of what conditions exist be conducted, if this wasn't already done, to determine an appropriate and reasonable percentage of projects to be completed in the five years period to show positive impact on water quality. However, if it is determined that 25 existing animal confinements may be contributing then prioritizing the ones that have the greatest potential toward water quality improvements would return a high ROI in both time and money. There are existing tools to assist in the evaluation of placement of corrals and how they may be contributing bacteria loading to nearby surface waters.

Additionally, an action item that could be added to assist with this topic could be to employ the expertise of the NRCS by conducting a Conservation Resource Plan for the property. Not only would this give the landowner a solid evaluation of areas that may need improvement, it would provide valuable information for future grant funding as well.

RESPONSE:
Five AFOs was the number the Little Powder River Steering Committee felt they could realistically deliver. Assistance offered through the AFO/CAFO programs are voluntary in nature. For this reason, outreach will be conducted to cooperate with the maximum number of producers as possible. The NRCS has been the technical resource the committee depends on to deliver engineering designs and recommendations for placement of these projects. All projects completed using 319 funds are certified as meeting NRCS standards by the local District Conservationist.

COMMENT 6:
Line 642 Has any evaluation of septics been conducted? Other conservation districts in the state have conducted evaluations to focus their efforts to get the best result possible. Again, the statements made above speak to the same issues for septics as animal confinement.

RESPONSE:
In the initial evaluation for feasibility of a septic program, the Conservation District worked cooperatively with the Campbell County Planning office to determine how many septic permits were filed within the boundaries of the watershed compared to the number of existing septics. This information was used as a needs assessment for the grant application and outreach efforts. This program has been successful in prompting homeowners with faulty septic systems to voluntarily remediate them. As more of these projects are completed we are hopeful that even more homeowners will request assistance. Home development within the Little Powder River Watershed is widely distributed. There are no areas of concentrated development that would lend itself to focused remediation such as small community or cluster-type systems.

Please let me know when your next meeting is to discuss the comments you receive on your draft plan. Also, let me know if you need clarification on any of the items I have listed and I look forward to seeing the great progress that is being made in the implementations in this watershed plan.

Sincerely,
Don Newton
TMDL Coordinator/Watershed Planner

Cc: File:Campbell CCD
Chrono