

1.0 INTRODUCTION

The Powder River Basin (PRB) of Wyoming is a major energy development area with diverse environmental values. The PRB is the largest coal-producing region in the United States (U.S.); PRB coal is used to generate electricity within and outside of the region. The PRB also has produced large amounts of oil and gas resources. Within the last decade, this region has experienced nationally significant development of natural gas from coal seams.

For the purpose of this study, the Wyoming PRB study area (**Figure 1-1**) comprises all of Campbell County, all of Sheridan and Johnson counties less the Bighorn National Forest lands to the west of the PRB, and the northern portion of Converse County. It includes all of the area administered by the Bureau of Land Management (BLM) Buffalo Field Office, a portion of the area administered by the BLM Casper Field Office, and a portion of the Thunder Basin National Grasslands (TBNG), which is administered by the U.S. Forest Service (FS) (**Figure 1-2**). State and private lands also are included in the study area. For water resources, the existing conditions are presented for the Powder River Structural Basin (also referred to as the Powder River Physiographic Basin), which includes the Powder/Tongue River Basin and Northeast Wyoming River Basins planning areas (**Figure 1-3**). The detailed study area encompasses the groundwater model domain (**Figure 1-1**), with emphasis placed on the overlap in the coal mine- and coal bed natural gas (CBNG)-related groundwater drawdown area.

During the 1970s and early 1980s, the PRB emerged as a major coal production region. Federal coal leasing was a high profile activity as over 90 percent of the PRB's coal is federally owned. Between 1974 and 1982, the BLM issued three and started a fourth separate regional coal environmental impact statement (EIS), all addressing federal coal leasing and development, as well as other regional development.

In 1982, the BLM temporarily halted further coal leasing. However, mining continued on existing leases. When leasing resumed in 1990, the existing mines were mature operations, and there was no need for regional leasing to open new mines. However, many of the mines were depleting their original reserves, so there was a need for maintenance leasing to provide reserves to enable existing mines to meet the expanding demand. The Powder River Regional Coal Team (PRRCT) decertified the region, allowing BLM to use the lease by application (LBA) process to meet this need. Each LBA required an EIS or environmental assessment (EA) as part of the leasing process.

Starting with the first LBAs, the BLM met the need for cumulative analysis in each EIS or EA with a discrete chapter addressing cumulative impacts. This approach served to highlight and focus cumulative impacts as distinct from site-specific impacts. With each subsequent EIS, the cumulative analysis was updated and new information added. In the mid-1990s, the BLM conducted a study called the PRB Coal Development Status Check to evaluate how actual development levels compared to the development levels predicted in the earlier regional EISs. The results of this study were presented to the PRRCT in 1996. Then, in the late 1990s, annual coal production and associated impacts drew closer to the maximum projections in the regional EISs. Furthermore, the large scale oil and gas development associated with coal bed natural gas (CBNG) development had not been foreseen in those EISs.

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For the most recent LBAs, the BLM used the cumulative analysis from the Wyodak EIS (BLM 2000b) and PRB Oil and Gas EIS (BLM 2003a), particularly for air and water resources. Both EISs projected regional development including CBNG activity. They both used market demand projections to estimate future levels of coal development.

In early 2003, BLM completed a study of PRB coal demand through 2020 (Montgomery Watson Harza 2003). The study projected production to increase at a steady pace with current mines able to meet the demand as long as the existing mines continue to have access to additional coal reserves; therefore, the need for leasing using LBAs will continue into the foreseeable future. As part of processing these LBAs, BLM will need to maintain a current cumulative impact analysis. An initial step in that direction is this PRB Coal Review, which includes the identification of current conditions in the PRB.

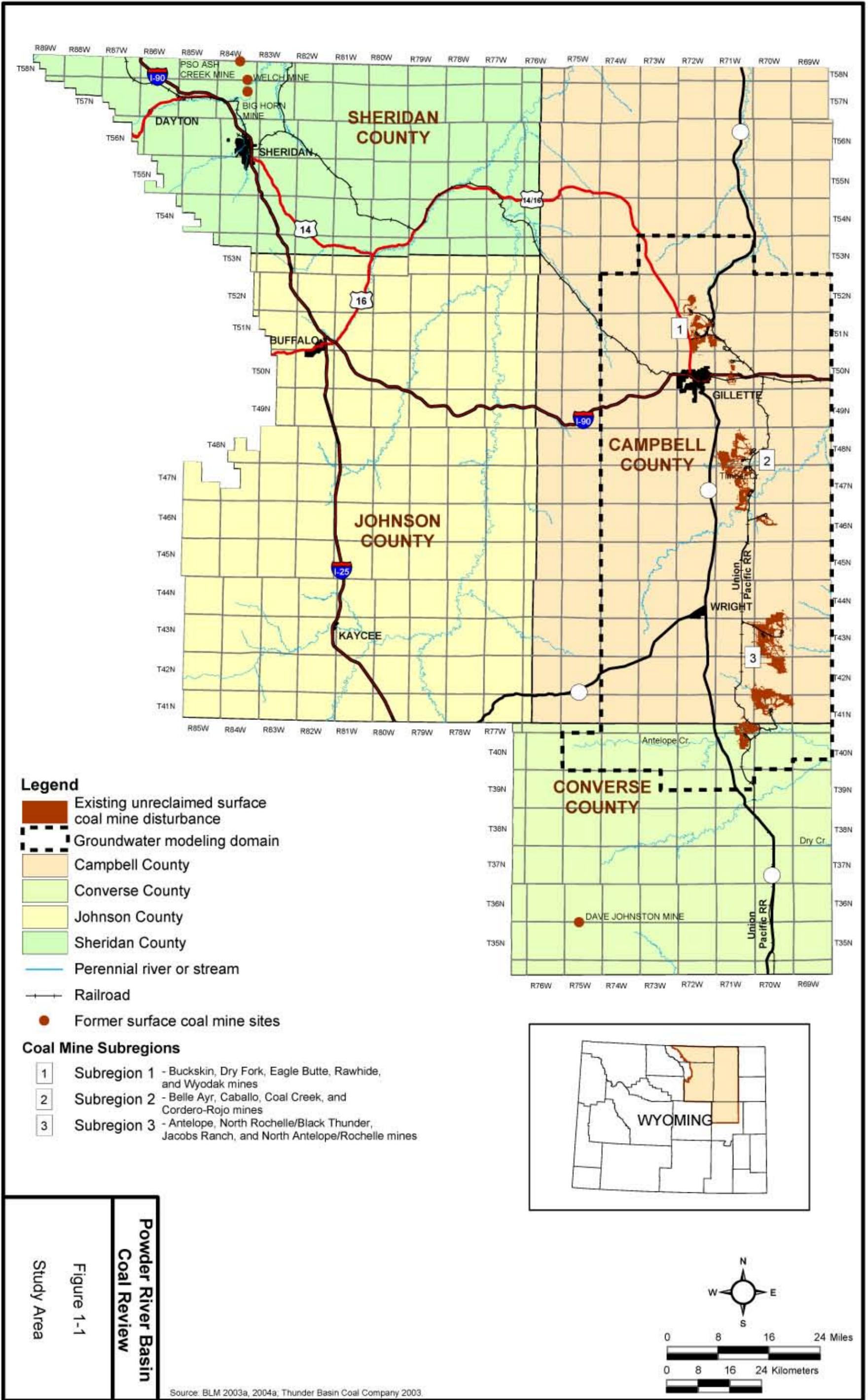
1.1 Objectives

This PRB Coal Review is a regional technical study to assess cumulative impacts associated with past, present, and reasonably foreseeable development in the PRB. The PRB Coal Review:

- Describes past and present (through 2002 for water) development activities in the PRB that have affected the environmental conditions in the study area;
- Describes the current (through 2002 for water, based on data availability) environmental conditions in the study area and compares these conditions to the conditions projected in the BLM's Coal Development Status Check (BLM 1996);
- Estimates reasonably foreseeable development in the study area through the year 2020, based on available information; and
- Estimates the environmental impacts associated with reasonably foreseeable future development through the year 2020.

The PRB Coal Review will provide data, models, and projections to facilitate cumulative analyses for future agency land use planning efforts and for future project-specific impact assessments for project development in compliance with the National Environmental Policy Act (NEPA). It should be noted that the PRB Coal Review itself is not a NEPA document. It is not a policy study, nor is it an analysis of regulatory actions or the impacts of project-specific development.

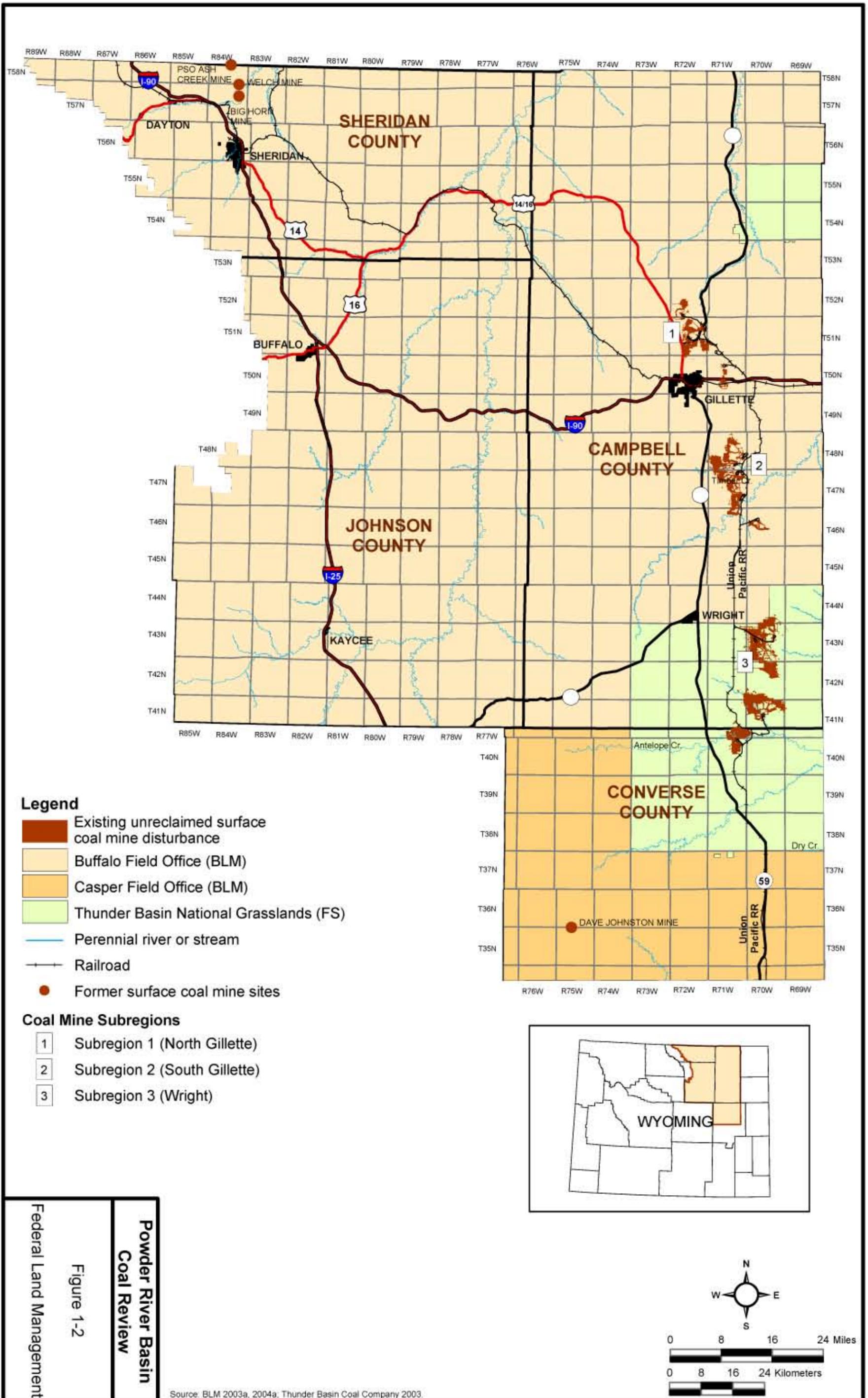
This report summarizes Task 1B of the PRB Coal Review, a description of the current (2002) water resource conditions associated with past and present coal development and other development in the PRB. The PRB Coal Review Task 1 descriptions for air quality, social and economic values, and other environmental resources are presented in separate stand-alone reports.



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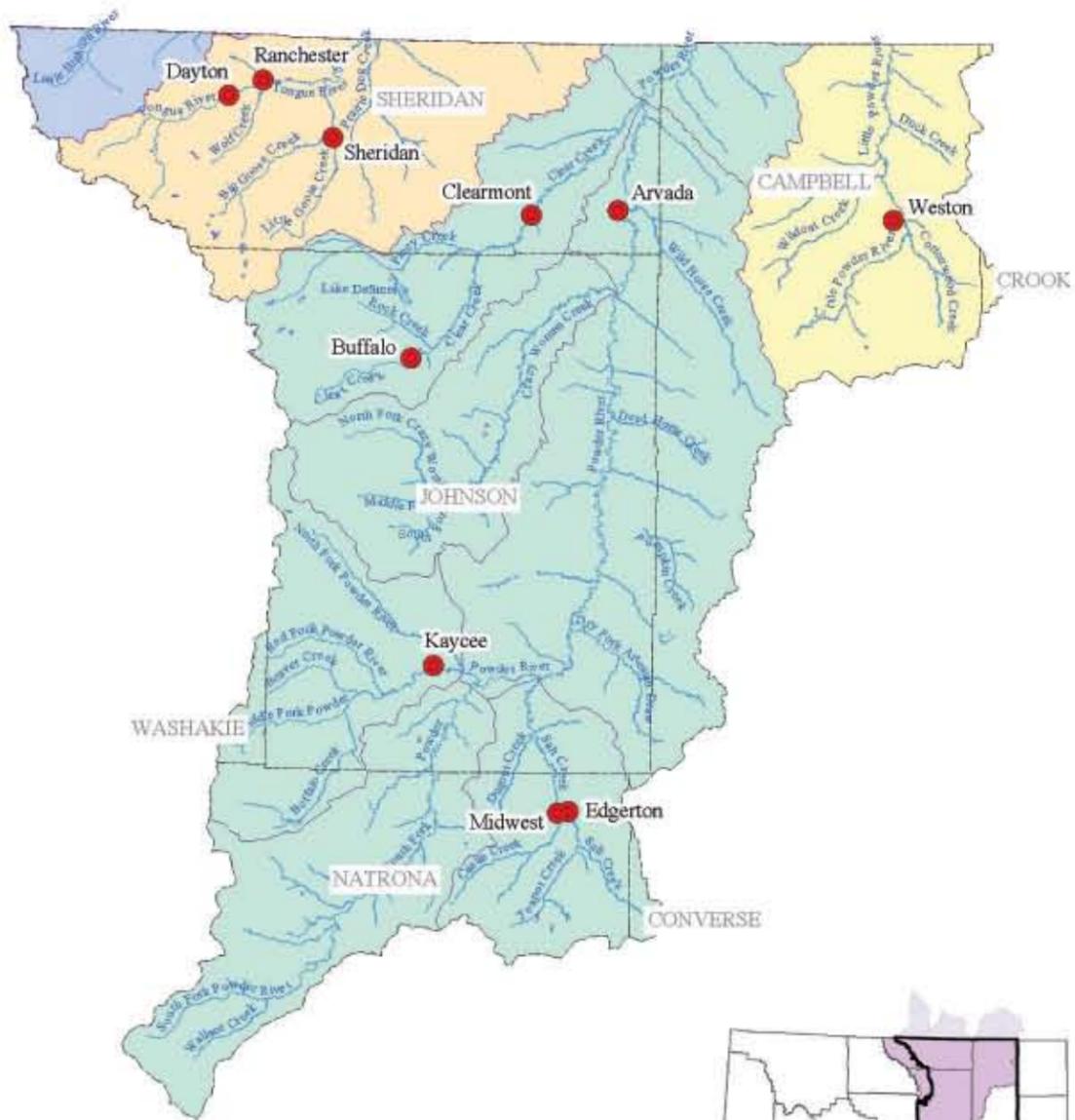
Powder River Basin
 Coal Review
 Figure 1-1
 Study Area

Source: BLM 2003a, 2004a; Thunder Basin Coal Company 2003.



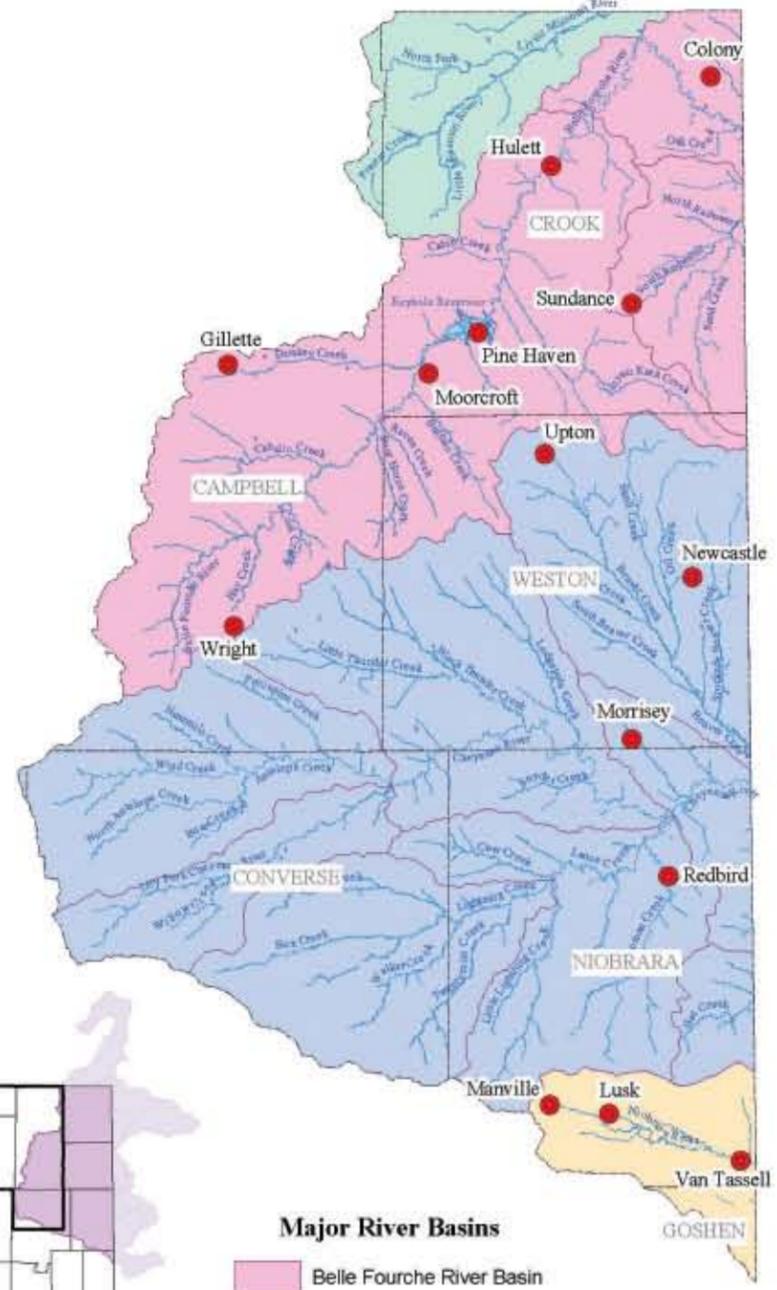
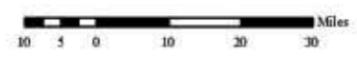
Powder River Basin Coal Review
 Figure 1-2
 Federal Land Management

Source: BLM 2003a, 2004a; Thunder Basin Coal Company 2003.



- Major River Basins**
- Little Bighorn River Basin
 - Little Powder River Basin
 - Powder River Basin
 - Tongue River Basin

Powder/Tongue River Basin Planning Area



- Major River Basins**
- Belle Fourche River Basin
 - Cheyenne River Basin
 - Little Missouri River Basin
 - Niobrara River Basin

Northeast Wyoming River Basins Planning Area



Powder River Basin Coal Review

Figure 1-3
Powder River Structural Basin

Source: HKM Engineering et al. 2002a,b.

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1.2 Key Issues

The key issues related to water resources include:

- Potential impacts to groundwater levels in the Fort Union and Wasatch formations due to continued coal mine expansion and CBNG development.
- Potential impacts to surface water resources from coal mine- and CBNG-related water discharge.

1.3 Agency Outreach, Coordination, and Review

The BLM directed the preparation of this PRB Coal Review. In order to ensure the technical credibility of the data, projections, interpretations, and conclusions of the study and ensure the study's usefulness for other agencies' needs, the BLM initiated contact with other federal and state agencies early in the study. This contact included meetings, periodic briefings, and written communications.

The BLM conducted an agency outreach program to solicit input from other agencies relative to their:

- Interested role and level of involvement in the study;
- Available data for use in the study; and
- Technical areas in which the agency would like to participate or review deliverables.

As part of this agency outreach and technical oversight, the BLM organized technical advisory groups for air quality, water resources, and socioeconomics. These groups were composed of agency representatives with technical expertise in the applicable resource(s). The PRB Water Resources Advisory Team has been actively involved in review of data and the PRB Coal Mine Groundwater Model (CMGM) protocol, development, and calibration.