

Environmental Assessment

Bridger Coal Lease Modification to WYW154595

WY-040-EA12-19

January 2013

Rock Springs Field Office, Wyoming



The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

BLM/WY/PL-15/006+1320

EA #: WY-040-EA12-19

1.0 INTRODUCTION

Proposed Action Title: Bridger Coal Lease Modification to WYW154595

Environmental Assessment (EA) Number: WY-040-EA12-19

Preparing Office: Bureau of Land Management (BLM)
Rock Springs Field Office (RSFO)
280 Highway 191 North
Rock Springs, Wyoming 82901

Proposed Action Type and Location: To modify the existing federal coal lease WYW154595 to include tracts of unleased federal coal lands situated within Section 34, Township 22 North, Range 101 West.

Applicant: Bridger Coal Company
c/o Interwest Mining Company
1407 West North Temple, Suite 310
Salt Lake City, Utah 84116

Lease/Serial/Case File No.: WYW154595 (Coal Lease)

1.1 Background

The Jim Bridger Coal Mine complex, located in southwestern Wyoming approximately 35 miles northeast of Rock Springs, is operated by Bridger Coal Company (BCC) and consists of a multi-faceted mining operation inclusive of surface, underground, and highwall mining methods together with ongoing reclamation operations. The mine produces coal from federal, private and state lands situated within the area known as the Union Pacific Railroad checkerboard land grant. Union Pacific lands are now owned and controlled by Anadarko Petroleum Corporation.

The Jim Bridger Coal Mine complex is a captive operation (the entire mine's production goes to one use and not for public sale) and has been in production since 1974 providing coal to the adjacent Jim Bridger Power Plant. The annual production of this mine complex is approximately 6 million tons. BCC is a joint venture comprised of two owners: Idaho Energy Resource Company, a wholly-owned subsidiary of Idaho Energy Resource Company; and Pacific Minerals, Inc., a wholly-owned subsidiary of PacifiCorp.

It is a high priority of both PacifiCorp and Idaho Energy Resource Company to minimize power generation costs and, in turn, the cost of electricity to their consumers. To achieve this priority, an acceptable fuel supply must be secured for the remaining life of the Jim Bridger Power Plant. The adjacent Jim Bridger surface coal mine has been supplying the majority of the coal requirements for the power plant over the past 38 years. The underground mine began full production in 2007 and is now providing the majority of the overall production, with the surface mine and coal from other sources supplementing the annual fueling requirements to the power

plant. The coal produced by underground mining methods replaces coal previously produced by surface mining methods, with no resulting change in annual coal production. Efforts to reclaim lands previously mined for surface coal can be increased as a result of shifting from surface mining to underground mining, which in fact is being done at the Bridger Coal mining operations.

The proposed tract borders coal mining activity on three sides: to the east is the Bridger Underground Mine, on the north and south the lands are leased to BCC for the purpose of underground coal mining. To the west there are no further underground mineable coal reserves. The proposed lease modification would support future expansion on the western side of the underground mine. This federal coal is located within the checkerboard land pattern and rights to mine coal from adjacent private lands have already been secured by BCC. The modification of the existing federal coal lease would ensure that all of the potentially mineable coal can be reached. The inclusion of this lease modification tract into the existing Jim Bridger underground coal mine operation would provide for efficient mining and is the only economical and technologically feasible means of recovering these federal coal reserves. If the federal resource under consideration for lease is not mined in conjunction with the intervening private coal, it would likely be bypassed.

The federal coal reserves contained within this lease tract, estimated at approximately 5.7 million tons of mineable coal, would be mined, delivered and utilized for the generation of electricity. This lease modification tract, together with the adjacent leased coal from private lands, forms a logical contiguous reserve which contributes to the Jim Bridger Power Plant long-range fueling requirements.

1.2 Purpose and Need for the Proposed Action

The purpose of the action is to modify federal coal lease WYW154595 and provide access to federal lands for the extraction of federal coal resources that would otherwise be bypassed without the modification. The coal resources are needed by the Jim Bridger Coal Mine to maintain mine operations and provide high quality, low-cost fuel in support of electrical generation at the adjacent Jim Bridger Power Plant. The lease modification would support expanded recovery for the underground mine and provide access to adjacent private coal lands. It would allow for a logical progression with the planned sequenced longwall mining panels in this area, ensure that these resources are not bypassed, and achieve maximum economic recovery of the federal coal resource.

The need for the project is established by BLM responsibility under the Mineral Leasing Act of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976 and the Federal Land Policy and Management Act (FLPMA) of 1976 to respond to a request to modify federal coal lease WYW154595. Part of this responsibility includes encouraging development of domestic coal reserves to meet future energy needs and reduced dependence on foreign sources of energy. For BCC's proposal, a lease modification would ensure federal coal resources that cannot be mined by any other operation are not bypassed.

Decision to be Made: The BLM will decide whether or not to modify the existing federal coal lease (WYW154595) to include the tract identified in the proposed action for the purpose of extracting the coal resources.

1.3 Relationship to Statutes, Regulations, Plans or Other Environmental Analyses

The Office of Surface Mining Reclamation and Enforcement (OSM) is a cooperating agency on this EA and will use this analysis to make decisions related to mining federal coal in this tract.

The BCC applied to modify federal coal lease WYW154595 on July 22, 2011. The BLM processed and evaluated the application under the following authorities: Mineral Leasing Act of 1920 as amended (MLA); Multiple-Use Sustained Yield Act of 1960; National Environmental Policy Act of 1969 as amended (NEPA); Federal Coal Leasing Amendments Act of 1976 (FCLAA); FLPMA; and the Surface Mining Control and Reclamation Act of 1977 (SMCRA).

The BLM is responsible for leasing federal coal under the FCLAA. After a coal lease is issued, SMCRA gives OSM the primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations. Pursuant to Section 503 of SMCRA, the Wyoming Department of Environmental Quality (WDEQ) developed, and in November 1980 the Secretary of the Interior approved, a permanent program authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on non-federal lands within the State of Wyoming. In January 1987, pursuant to Section 523(c) of SMCRA, WDEQ entered into a cooperative agreement with the Secretary of the Interior authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on federal lands within the state. Pursuant to this agreement, federal coal lease holders in Wyoming must submit permit application packages to OSM and WDEQ for proposed mining and reclamation operations on federal lands in the state. WDEQ reviews the package to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the performance standards of the approved Wyoming state permanent program. If it does comply, WDEQ issues the applicant a permit to conduct coal mining operations.

WDEQ enforces the performance standards and permit requirements for reclamation during the mine's operation and has primary authority in environmental emergencies. OSM retains oversight responsibility for this enforcement. If the coal lease is modified to include the requested additional acreage, the lessee will be required to obtain a coal mining permit prior to mining the coal.

Conformance to the Land Use Plan: Regulations at 43 CFR 1610.5-3 require actions to be in conformance with the approved land use plan. The Green River Resource Management Plan (GRRMP) and Record of Decision (ROD), effective 1997, allow for coal leasing and development and the BLM has determined that modification of lease WYW154595 conforms to the GRRMP. The GRRMP provides land use guidance for coal leasing within the proposed project area. The GRRMP decisions pertaining to this proposal include:

- Solid Leasables (Coal), page 13

- The objective for management of the federal coal resources in the planning area is to provide for both short- and long-range development of federal coal, in an orderly and timely manner, consistent with the policies of the federal coal management program, environmental integrity, national energy needs, and related demands.
- With appropriate limitations and mitigation requirements for the protection of other resource values, all BLM-administered public lands and Federal coal lands in the Green River planning area, except for those lands identified as closed, are open to coal resource inventory and exploration to help identify coal resources and their development potential.

Relationship to Other Environmental Analyses: As allowed by regulations at 40 CFR 1500 and 43 CFR 46 and BLM guidance (*BLM National Environmental Policy Act Handbook H-1790-1*, BLM 2008), this environmental analysis incorporates by reference information found in the *Final Environmental Assessment for the Proposed Ten Mile Rim Coal Lease-by-Application and Associated Rights-of-Way, Sweetwater County, Wyoming* (BLM 2004) (TMRT EA). The EA analyzed the leasing and mining of federal coal reserves located within the Ten Mile Rim Tract (TMRT) in response to a lease-by-application (LBA) filed by BCC, and was used by BLM as the basis for the decision to hold a competitive, sealed-bid sale and eventual issuance of coal lease WYW154595. The final TMRT EA can be reviewed at: http://www.blm.gov/style/medialib/blm/wy/information/NEPA/rsfodocs/10milerim.Par.26183.File.dat/01final_ea.pdf.

Incorporation by reference of the TMRT EA is appropriate to supplement description of the affected environment and general conclusions about environmental impacts associated with underground mining operations in the area. To ensure full disclosure, this EA will provide additional analyses and description of impacts specific to this proposal.

This EA is also tiered to the environmental analyses provided in the *Final Environmental Impact Statement (EIS) for the Pit 14 Coal Lease-by-Application, Sweetwater County, Wyoming, (Federal Coal Lease Application WYW-160394)* (BLM 2006) (Pit 14 FEIS). This document was prepared for a LBA filed by Black Butte Coal Company to further surface mining operation at the Black Butte Coal Mine. It is appropriate to tier to this document because the emissions inventory area and air analysis, as well as the assessment areas and analysis conducted for various resources, takes into consideration impacts associated with the Bridger Mine operations and Jim Bridger Power Plant. The EIS can be reviewed at: <http://www.blm.gov/style/medialib/blm/wy/information/NEPA/rsfodocs/pit14/feis.Par.47265.File.dat/00feis.pdf>

1.4 Scoping, Public Involvement and Issues

The BLM RSFO issued a news release on April 3, 2012, requesting public comment on the Proposed Action; a scoping notice was published on April 3, 2012, on the BLM Wyoming website. The 30-day comment period ended on May 2, 2012. During this period, the BLM received seven comment letters: one from a state governmental agency, one from Sweetwater County, two from local chambers of commerce, two from nongovernmental environmental

organizations and one from a Wyoming citizen. A Summary of Scoping Comments is included as Appendix A.

Issues and concerns identified during both external scoping and internal discussions with the BLM interdisciplinary (ID) team included water depletion, potential impacts to cultural and wildlife resources, reclamation, potential impacts to local/regional air quality, and potential contribution to global climate change.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternative I – No Action Alternative

The No Action Alternative is to reject the application to modify the existing coal lease (WYW154595) and not add the additional estimated 5.7 million tons of mineable coal beneath the 320.36 acres in Section 34, T. 22 N., R. 101 W. to the Jim Bridger Coal Mine complex.

Under the No Action Alternative, it is assumed the federal coal within these lands would not be mined in the near future, if at all. Due to its location within in the checkerboard land area, and the given current limitations in underground extraction technology, it is unlikely that BCC, or any other coal operator, would be able to economically mine these resources once current operations move away from these lands. Further, under the No Action Alternative, BCC would not be able to economically access all of the private underground reserves they currently have under private lease.

Under the No Action Alternative, the BLM would continue to manage the federal surface lands comprising the lease modification area for multiple use, including but not limited to: livestock and wild horse grazing, recreation, and oil and gas exploration and development. A federal oil and gas lease held by GMT Exploration Company, LLC, *et al.* (WYW174554) exists on the proposed coal lease modification tract; however, the leaseholder has not yet initiated oil and gas operations. The lease is valid until January 31, 2018. No active locatable mineral mines or construction aggregate quarries are known in the project area.

2.2 Alternative II – Proposed Action

The Proposed Action is to modify federal coal lease WYW154595 to include 320.36 acres of contiguous coal lands, as described as follows:

6th Principal Meridian, T. 22 N., R. 101 W.,
Section 34, lots 3-5, 9-12, NE¼NW¼.

Containing 320.36 acres, more or less.

The federal lands in Section 34 are managed by the BLM (Figure 2.1). Federal coal lease WYW154595 was originally issued to BCC on March 1, 2005. This lease modification (1) would not displace other competitive commercial interests in the lands or deposits; (2) would not include coal deposits that can be developed as a part of another potential or existing mining

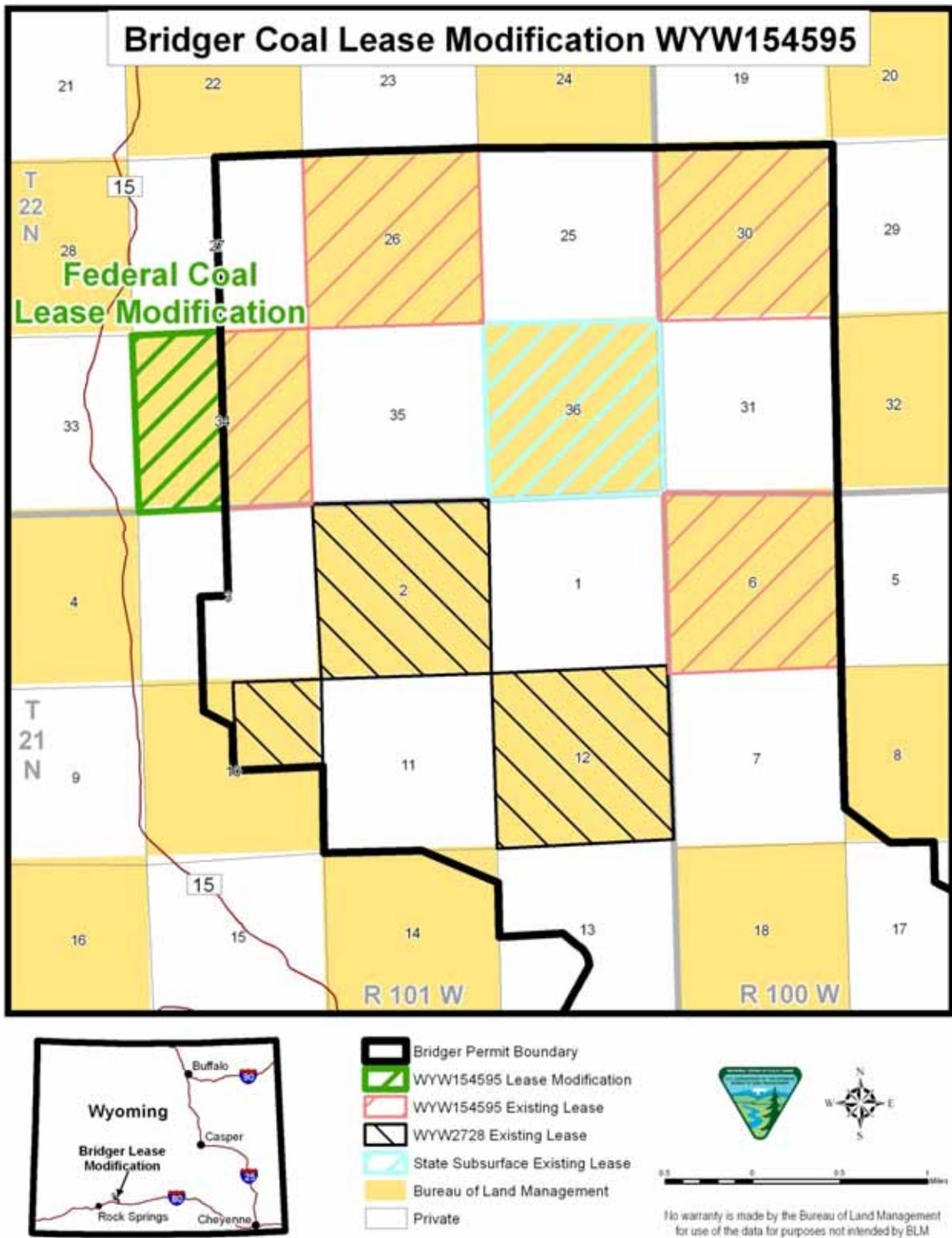


Figure 2.1. Bridger Coal Lease Modification WYW154595

operation; and (3) would be in the interest of the United States. This lease modification would not exceed the modified acreage limitation of 960 acres as set forth with the passage of the Energy Policy Act of 2005.

The proposed lease modification tract is adjacent to current operations. The existing mine infrastructure provides an economical and technological mechanism of mining these coal resources. The modification tract is needed within the next 12 months to allow time to amend the existing mine permit. Mining of the approximately 5.7 million tons of mineable coal in the lease modification area is anticipated to add up to approximately one year of reserves to the existing operation, depending upon power plant fueling requirements. The estimated recoverable reserves within the area of the proposed lease modification are predicated on several factors inclusive of inherent geologic and mining conditions, coal quality, mine economics, marketability, environmental concerns, and safety. The coal produced by underground mining methods replaces coal previously produced by surface mining methods, with no resulting change in annual coal production.

This modification would be advantageous and beneficial to the interests of the United States because it provides the following:

- Creates a contiguous property between the existing federal, private and state leases, thus providing the necessary legal right-of-entry to sequentially mine westward from the existing underground mine onto these adjacent lands.
- Allows mining of federal coal that would otherwise not be logically accessible and recoverable by any other operation and would otherwise most likely be bypassed.
- Provides additional revenues to the United States in the form of annual rentals and production royalties.
- Provides a logical and sustained link within the existing boundaries for continued operations.
- Efforts to reclaim land previously mined for surface coal can be increased as a result of shifting from surface mining to underground mining.

2.2.1 Underground Coal Mine

Underground coal production at the Jim Bridger Underground Mine began on fee coal lands in the second quarter of 2004. The underground mine came on line with full production (an estimated 3.5 million tons per year) during 2007 and is now providing the majority of the overall production from the Jim Bridger Mine complex to the Jim Bridger Power Plant.

The mining method used at the underground mine utilizes continuous miners (mining machinery) and retreat longwall mining. The longwall is used as the primary means of extracting the coal reserves. Longwall mining is a mining method that involves removing a long section (wall) of coal in a single slice. Approximately 85-90% of the coal recovered from the underground mine is achieved by the longwall. The underground mine is developed with continuous miners developing main and sub-main entries with gateroads (roadways that provide access to the working panel) to access and support a series of longwall mining panels. This technique ensures the best possible means of safely maximizing economic reserve recovery while maintaining coal quality and ground control.

Surface facilities include three portals that serve as the main access routes to the underground mining operations. They were constructed at the base of Ramp 14, the northernmost ramp, at the north end of the surface mining area. Two of the portal entries are used for access by miners, and the third is used to transport coal from the underground mine to a coal handling facility on the surface within the Ramp 14 pit area. Two stacking tubes allow for the stockpiling and blending of different qualities of coal. All extracted underground coal is transported approximately 6.6 miles by a series of conveyors to the power plant.

Additional surface facilities for the underground mine reside at two general locations. The main ventilation fan, water well, rock dust supply and mine power distribution are located directly above the portals on the highwall side of the pit. The office, bathhouse, maintenance, and warehouse facilities are located on the surface near the entrance of Ramp 14. BCC does not anticipate that any additional surface facilities would be constructed to mine the coal reserves within the proposed lease modification tract.

2.2.2 Oil and Gas Lease or Other Operations

A federal oil and gas lease held by GMT Exploration Company, LLC, *et al.* (WYW174554) exists on the proposed coal lease modification tract and is valid until January 31, 2018. This lease was issued with a condition stipulating that, should the leaseholder develop oil and gas operations near coal mining activity, a plan for mitigation of anticipated impacts be developed between the oil and gas and the coal lessees. The plan is subject to the approval of the authorized officer. Since the leaseholder has not yet initiated any oil and gas actions on the lease, as yet no plan has been developed.

No active locatable mineral mines or construction aggregate quarries are known in the project area.

2.2.3 Reclamation

Reclamation of lands previously mined by surface methods is ongoing and has increased since the underground mine production began displacing coal production from the surface. Surface mining equipment, such as draglines, front end loaders, dozers and trucks, which were used for producing coal are now used, at least part of the time, for reclamation. The reclamation schedule is dependent on the WDEQ-approved Mine and Reclamation Plan and the mining sequence. The Proposed Action would delay the anticipated timeline for final reclamation of disturbed areas surrounding the portal (Ramp 14) by at least one year as the use of the surface support facilities would be extended.

2.3 Other Action Alternatives

No other alternatives were identified for analysis. BLM mining specialists worked to identify the area that would best ensure Maximum Economic Recovery of the coal reserves, as required by the MLA. No other size tract would meet federal standards.

There is no logical competitive interest based upon utilization of the lands or mining of the deposits because:

- The applicant is the lessee of record holding the private, state and federal leases adjacent to the modification area.
- This lease modification would allow a continuum of an existing mining block and would not represent an economic venture based on a stand-alone development of the property.
- There is no other nearby operation which could economically mine this area.
- The only logical access is from the applicant's underground mine and adjacent leases.

2.4 Alternatives Considered but not Analyzed in Detail

No other alternatives were identified that met the purpose and need for this action.

3.0 AFFECTED ENVIRONMENT

Table 3.1 identifies which potentially affected resources are appropriate for analysis.

Table 3.1 Affected Resources Overview

Determination ¹	Resource	Rationale for Determination
PI	Air Quality/Green House Gas Emissions	See discussion in Affected Environment and Environmental Effects sections.
NP	Areas of Critical Environmental Concern (ACEC)	No ACECs are located within the project area.
PI	Cultural Resources	See discussion in Affected Environment and Environmental Effects sections.
NI	Environmental Justice	The action alternatives were reviewed in accordance with Executive Order 12898 and no impacts to minority and low-income populations are expected.
NP	Farmlands: Prime or Unique	No farmlands are located within the project area.
NP	Floodplains	No floodplains are located within the project area.
NI	Fuels/Fire Management	The surface would not be occupied by the lessee. Project area is not a fuels management area.
PI	Geology, Geologic Hazards, Mineral Resources	See discussion in Affected Environment and Environmental Effects sections.
NI	Invasive Species/Noxious Weeds	No Invasive Species/Noxious Weeds would be introduced to the lease modification area from mining activity because there would be no surface use or operations.
NI	Lands/Access	There is one oil and gas lessee in the project area; however, there are no oil and gas wells in the project area. Underground coal mining would not impact access or other land uses because there would be no surface disturbance or use associated with the proposal. Subsidence would likely occur, but no facilities or active roads lie above the areas proposed for mining, so no impact is expected.

Determination¹	Resource	Rationale for Determination
NI	Livestock Grazing	Underground coal mining would not impact livestock grazing or other land uses because there would be no surface use or operations. Subsidence would likely lower the surface level; however, it would not be expected to change Animal Unit Month levels.
PI	Native American Religious Concerns	See discussion in Affected Environment and Environmental Effects (Cultural Resources) sections.
NI	Paleontology	Subsidence would likely occur but would not be expected to destroy any fossils, although the context of their preservation may be altered. There are no known paleontological resources in the project area.
NI	Public Health & Safety	Underground coal mining would not impact public health and safety because no operations would occur on the surface. The Mining Safety and Health Administration (MSHA) requires the mine operator to restrict public access to mine areas.
NI	Rangeland Health Standards	Underground coal mining would not impact the health of rangeland or other land uses because there would be no surface use or operations.
NI	Recreation	Expanding the area of underground coal mining would not impact recreation as there would be no surface use or operations. Recreational opportunities may be restricted based on permit or MSHA requirements, but undergrounding mining would not conflict with any allowed recreational activity.
PI	Socio-Economics	See discussion in Affected Environment and Environmental Effects sections.
NI	Soils	Expanding the area of underground coal mining would not impact soils because there would be no surface use or operations. Any subsidence that occurs would not be enough to increase erosion or impact soils.
NI	Special Status Species	Expanding the area of underground coal mining would not impact Special Status Species or other land uses because there would be no surface use or operations. Any subsidence that occurs would not be enough to modify habitat.
NP	Threatened, Endangered or Candidate Plant Species	No Threatened, Endangered, or Candidate Plant Species are found in the project area.
NI	Threatened, Endangered or Candidate Animal Species	The project area is within Greater Sage-Grouse core habitat; however, the project would not impact habitat or Greater Sage-Grouse because there would be no surface use or activity. Any subsidence that occurs would not be enough modify habitat.
NI	Wastes (hazardous or solid)	Underground coal mining would not impact Wastes (hazardous or solid) or other land uses because there would be no surface use or operations.
PI	Water Resources/Quality (drinking/surface/ground)	See discussion in Affected Environment and Environmental Effects sections.
NP	Wetlands/Riparian Zones	None are located within the project area.
NP	Wild and Scenic Rivers	None are located within the project area.
NP	Wilderness	None are located within or near the project area.
NP	Woodland/Forestry	None are located within the project area.

Determination ¹	Resource	Rationale for Determination
NI	Vegetation	While any area of subsidence could slightly affect moisture retention in the area, it is not expected to have more than slight impacts on vegetation in the affected area or substantially change species habitat or impact wildlife movement.
NI	Visual Resources	Underground coal mining would not impact Visual Resources or other land uses because there would be no surface use or operations. All activity would be below ground. If subsidence were to occur, the affected area would be generally imperceptible to the casual viewer.
NI	Wild Horses and Burros	Underground coal mining would not impact Wild Horses and Burros or other land uses because there would be no surface use or operations.
NI	Wildlife	Underground coal mining would not impact use of the surface by wildlife. While any area of subsidence could slightly affect moisture retention in the area, it is not expected to substantially change species habitat or impact wildlife movement.
¹ Determination: PI: <u>P</u> otential <u>I</u> mpact could occur from one or more alternatives; therefore, analyzed in this NEPA document. NP: <u>N</u> ot <u>P</u> resent in the project area. NI: <u>N</u> o <u>I</u> mpact expected from action alternatives, or potential impacts already addressed in referenced NEPA document(s); therefore, not analyzed in this document.		

The proposed modification tract and adjacent lands are undeveloped with little human visitation. Existing roads in the project area include several unpaved two-tracks. Nearby, Sweetwater County Road 4-17 serves local traffic and connects to Interstate 80 (I-80), approximately 10 miles to the south (via Sweetwater County Road 4-15).

Previous uses in the project area include cattle and sheep grazing, hunting, dispersed recreation, exploratory drilling for coal in support of the Bridger Underground Mine, and oil and gas exploration activity in the general vicinity. There is currently no known oil and gas activity on the proposed modification tract (although there is an active lease – see Section 2.2.2), and the drill holes have been reclaimed in accordance with BLM and WDEQ exploration drilling standards and requirements. No active locatable mineral mines or construction aggregate quarries are known in the project area. Current and anticipated future uses include cattle and sheep grazing, hunting, and dispersed recreation.

3.1 Air Quality/Global Climate Change

The climate in the area of the Jim Bridger Coal Mine complex is classified as semi-arid. It is characterized by abundant sunshine, wide seasonal and diurnal temperature variations, slight precipitation, and long cold winters. Precipitation averages 8 inches annually and mostly occurs in the form of snow and spring rain. The region is windy and the wind generally blows from a westerly-southwesterly direction as indicated by the wind rose generated for the Snow Springs Creek monitor (Figure 3.1).

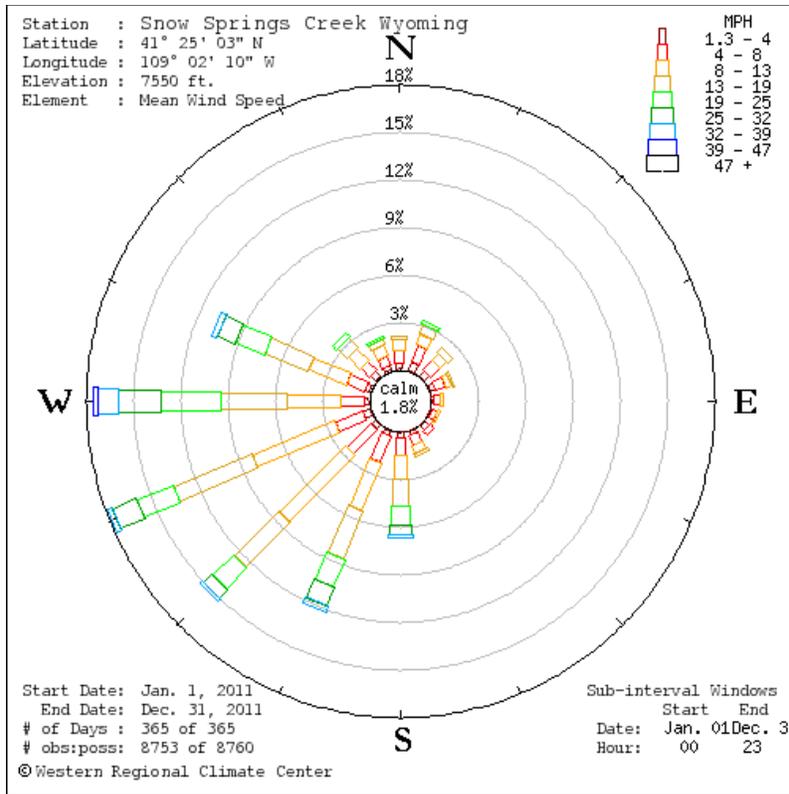


Figure 3.1. Snow Springs Creek Wind Rose

**Table 3.2. Period of Record Climate Summary
 August 1, 1948 through August 26, 2012**

Rock Springs FAA Airport	Annual Averages
Average Max. Temperature (F)	55
Average Min. Temperature (F)	31
Average Total Precipitation (in.)	8.63
Average Total Snow Fall (in.)	43.6
Average Snow Depth (in.)	1

Source: WRCC 2012.

3.1.1 Air Pollutant Concentrations

Monitoring, permitting and enforcement of air quality standards is administered by the WDEQ-Air Quality Division (WDEQ-AQD). Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS) identify maximum limits for concentrations of criteria air pollutants at all locations to which the public has access. Criteria air pollutants are those for which national concentration standards have been established; criteria air pollutants

include particulate matter nominally 10 microns or less (PM₁₀), particulate matter nominally 2.5 microns or less (PM_{2.5}), ozone (O₃), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂), carbon monoxide (CO) and lead.

The WAAQS and NAAQS are legally enforceable standards. Criteria air pollutant concentrations are compared to NAAQS and WAAQS to determine compliance. Violation of an air quality standard represents a risk to human health or welfare that, by law, requires public safeguards to be implemented. Table 3.3 presents the current primary NAAQS and WAAQS.

Table 3.3. National Ambient Air Quality Standards and Wyoming Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards (NAAQS)			Wyoming Ambient Air Quality Standards (WAAQS)		
		Primary			Primary		
		(ppm)	(ppb)	(ug/m ³)	(ppm)	(ppb)	(ug/m ³)
Carbon Monoxide	1 hour	35 ^(a)	35,000	40,000	35	35,000	40 (mg/m ³)
	8 hour	9 ^(a)	9,000	10,000	9	9,000	10 (mg/m ³)
Lead	Rolling 3-month	---	---	0.15	---	---	0.15
Nitrogen Dioxide	1 hour	0.1	100 ^(b)	189	---	---	---
	Annual (Arithmetic Mean)	0.053	53	100	0.05	50	100
PM ₁₀	24 hour	---	---	150 ^(c)	---	---	150 ^(c)
	Annual (Arithmetic Mean)	None			---	---	50
PM _{2.5}	24 hour	---	---	35 ^(d)	---	---	35 ^(d)
	Annual (Arithmetic Mean)	---	---	15.0 ^(e)	---	---	15.0 ^(e)
Ozone	8 hour	0.075 ^(f)	75	147	0.08	80	157
Sulfur Dioxide	1 hour	0.075	75 ^(g)	197	---	---	---
	3 hour	None			0.50	500	1,300
	24 hour	None			0.10	100	260
	Annual (Arithmetic Mean)	None			0.02	20	60
Hydrogen Sulfide	1/2 hour average	---	---	---	0.05	50	70 ^(h)
	1/2 hour average	---	---	---	0.03	30	40 ⁽ⁱ⁾

Source: BLM 2012a.

Air quality in the project area is generally very good with measured background concentrations of all criteria pollutants below the established standards. Background concentrations of these pollutants define ambient air concentrations in the region and establish existing compliance with ambient air quality standards. The most representative monitored regional background

concentrations available for criteria pollutants as identified by WDEQ-AQD (WDEQ-AQD, 2011) are shown in Table 3.4.

Table 3.4. Background Ambient Air Quality Concentrations (Micrograms per Cubic Meter [$\mu\text{g}/\text{m}^3$])

Pollutant	Averaging Period	Measured Background Concentration
CO ¹	1-hour	1,026
	8-hour	798
NO ₂ ²	1-hour	75
	Annual	9.1
O ₃ ³	8-hour	126.1
PM ₁₀ ⁴	24-hour	56
	Annual	13.5
PM _{2.5} ⁵	24-hour	9.2
	Annual	4.2
SO ₂ ⁶	1-hour	19.7
	3-hour	11.5
	24-hour	4.2
	Annual	3.8

¹ Data collected during 2008 at Murphy Ridge, Wyoming; concentrations are maximum values.

² Data collected at Wamsutter, Wyoming; 1-hour concentration is the three year average (2008-2010) of daily maximum 98th percentile 1-hour concentrations, annual value is for 2010.

³ Data collected at Wamsutter, Wyoming; 8-hour concentration is the three year average (2008-2010) of the fourth-highest daily maximum 8-hour concentrations.

⁴ Data collected at Wamsutter, Wyoming during 2010; 24-hour value is maximum concentration.

⁵ Data collected at Cheyenne, Wyoming; 24-hour value is the three-year average (2008-2010) of daily maximum 98th percentile 24-hour concentrations, annual value is three-year average of annual means (2008-2010).

⁶ Data collected at Wamsutter, Wyoming; 1-hour value is the three-year average (2007-2009) of daily maximum 98th percentile 1-hour concentrations, 3-hour, 24-hour and annual concentrations were collected during 2009, 3-hour and 24-hour data are maximum values.

Source: BLM 2012a.

Background regional concentrations indicate that ozone is a pollutant of concern in the region. Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen and volatile organic compounds in the presence of sunlight under certain meteorological conditions. In March 2008, the U.S. Environmental Protection Agency (EPA) set the current NAAQS for ozone to 0.075 parts per million (ppm) based on the fourth highest 8-hour average value per year at a site, averaged over three years. Based on monitoring results from 2006 through 2008, the WDEQ-AQD recommended that the Upper Green River Basin (UGRB) be designated as nonattainment for the 2008 ozone standard. EPA officially designated the area as nonattainment on April 30, 2012 with a marginal classification. Elevated ozone in the UGRB is associated with distinct meteorological conditions typically occurring in the winter months. While a portion of the ozone nonattainment area does extend into the BLM Rock Springs Field Office, it is not inclusive of the mine or power plant facilities.

The primary pollutant of concern from mining activities is particulate matter emissions or PM₁₀. As part of the mine's existing Air Quality Permit (MD-1225), the facility must implement measures to reduce fugitive dust impacts in accordance with a Fugitive Dust Control Plan. Elements of this plan include requirements for watering and the use of chemical sealant for

inactive storage piles. In addition, ambient PM₁₀ monitors are in place to monitor compliance. Table 3.5 presents a historical record of PM₁₀ concentrations for the facility.

Table 3.5. Bridger Coal Company Monitored PM₁₀ Concentrations (2006-2011)

(WAAQS PM₁₀ Standards = 50 µg/m³ Annual, 150 µg/m³ 24-Hour)				
Year	Site	Annual Average	24-Hour High	24-Hour 2 nd High
2006	JB-4	17.6	67.2	66.9
	JB-5	17.6	107.3	101.2
2007	JB-4	20.9	97.1	94.1
	JB-5	23.3	120.6	91.0
2008	JB-4	21.0	176.1	154.8
	JB-5	20.0	142.0	105.2
2009	JB-4	12.8	103.2	91.8
	JB-5	14.1	94.3	69.0
2010	JB-4	9.3	105.5	52.0
	JB-5	11.0	143.7	123.0
2011 ¹	JB-4	8.2	63.9	41.8
	JB-5	10.5	70.5	42.6

¹ Data is through the 2nd quarter of 2011.

Source: WDEQ-AQD 2011.

In April 2008, a PM₁₀ concentration of 176.1 µg/m³ recorded at JB-4 resulted in a Notice of Violation being issued to Bridger Coal Company. Other than the 2008 exceedance, the record of ambient monitoring data from the mine demonstrates compliance with both the annual PM₁₀ WAAQS and the 24-hour PM₁₀ NAAQS.

In a previous analysis completed for the Bridger Coal Mine (MD-9156), the WDEQ-AQD conducted an ambient impact analysis for annual NO_x and PM₁₀ emissions. The analyses indicated that the model-predicted concentrations for NO_x and PM₁₀ were below the WAAQS and NAAQS as shown in Table 3.6.

Table 3.6. Results of NAAQS/WAAQS Analyses for MD-9156

Pollutant	Averaging Time	Model Year	Model Impact (µg/m ³) ¹	Background Concentration (µg/m ³)	Total Modeled Impact (µg/m ³)	WAAQS/NAAQS (µg/m ³)
PM ₁₀	Annual	2010	14.84	16.0	30.84	50
		2011	15.34	16.0	31.34	
NO _x	Annual	2010	15.31	4.0	19.31	100
		2011	15.28	4.0	19.28	

¹ The reported impacts for 24-hour are the highest second-high impacts.

NAAQS = National Ambient Air Quality Standards

µg/m³ = micrograms per cubic meter

WAAQS = Wyoming Ambient Air Quality Standards

Source: WDEQ-AQD 2011.

Minor sources within the State of Wyoming are required to report their emissions to the WDEQ-AQD on a three-year basis. The last available Minor Source Emission Inventory for the Jim Bridger Coal Mine is the 2008 inventory which included the reported emissions shown in Table 3.7.

Table 3.7. 2008 Emissions Inventory for the Bridger Coal Mine Complex

Emissions	Tons
Carbon Monoxide (CO)	173
Nitrogen Oxides (NO _x)	165.82
Particulate Matter (PM ₁₀)	3,052.83
Sulfur Dioxide (SO ₂)	14

Source: WQED-AQD 2012a.

The Jim Bridger Power Plant is located adjacent to the surface mining operation. This plant operates under a separate Title V Operating Permit (Permit No. 3-1-120-2) issued by WDEQ-AQD that contains requirements for ambient air monitoring, recordkeeping, and annual reporting. The 2010 emission inventory is the most recently available and included the reported emissions shown in Table 3.8.

Table 3.8. 2010 Emissions Inventory for the Jim Bridger Power Plant

Emissions	Tons
Carbon Monoxide (CO)	7,268.7
Nitrogen Oxides (NO _x)	16,371.3
Particulate Matter (PM ₁₀)	1,982.9
Sulfur Dioxide (SO ₂)	13,445.8
Volatile Organic Compounds (VOCs)	287.4
Hazardous Air Pollutants (HAPs)	215.15

Source: WQED-AQD 2012b.

3.1.2 Greenhouse Gases/Climate Change

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG) and include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and several fluorinated species of gas. Carbon dioxide is emitted from the combustion of fossil fuels, including coal. Methane can be emitted during the production and transport of coal. CO₂ and other GHGs are naturally occurring gases in the atmosphere; their status as a pollutant is not related to their toxicity, but instead is due to the added long-term impacts they may have on climate because of their increased incremental levels in the earth’s atmosphere. Because they are non-toxic and non-hazardous at normal ambient concentrations, CO₂ and other naturally occurring GHGs do not have applicable ambient standards or emission limits under the major environmental regulatory programs. Currently, the WDEQ-AQD does not have regulations regarding GHG emissions, although these emissions are regulated indirectly by various other regulations.

However, in October 2009, the USEPA issued the final mandatory reporting rule for major sources of GHG emissions. The rule requires a wide range of sources and source groups to record and report selected GHG emissions, including CO₂, CH₄, N₂O, and some halogenated compounds.

The Center for Climate Strategies prepared the Wyoming Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) for the WDEQ through an effort of the Western Regional Air Partnership. This inventory report presents a preliminary draft GHG emissions inventory and forecast from 1990 to 2020 for Wyoming. This report provides an initial comprehensive understanding of Wyoming's current and possible future GHG emissions. The inventory report discloses that activities in Wyoming accounted for approximately 56 million metric tons (MMt) of *gross* carbon dioxide equivalent (CO₂e) emissions in 2005, an amount equal to 0.8% of total US gross GHG emissions. These emission estimates focus on activities in Wyoming and are *consumption-based*; they exclude emissions associated with electricity that is exported from the state. Wyoming's gross GHG emissions increased 25% from 1990 to 2005, while national emissions rose by only 16% from 1990 to 2004. Wyoming's per capita emission rate is more than four times greater than the national average of 25 MMtCO₂e/yr. This large difference between national and state per capita emissions occurs in most of the sectors – Wyoming's emission per capita significantly exceed national emissions per capita for the following sectors: electricity, industrial, fossil fuel production, transportation, industrial process and agriculture. The reasons for the higher per capita intensity in Wyoming are varied but include the state's strong fossil fuel production industry and other industries with high fossil fuel consumption intensity, large agriculture industry, large distances, and low population base. Between 1990 and 2005, per capita emissions in Wyoming have increased, mostly due to increased activity in the fossil fuel industry, while national per capita emissions have changed relatively little. Annual sequestration (removal) of GHG emissions due to forestry and other land-uses in Wyoming was estimated at 36 MMtCO₂e in 2005 (Center for Climate Strategies 2007).

Climate change may result from natural processes, such as changes in the sun's intensity; natural processes within the climate system (such as changes in ocean circulation); human activities that change the atmosphere's composition (such as burning fossil fuels) and the land surface (such as urbanization) (Intergovernmental Panel on Climate Change [IPCC] 2007). Ongoing scientific research has identified the potential impacts of GHG emissions such CO₂, CH₄, N₂O; water vapor; and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably and may contribute to overall climatic changes, typically referred to as global warming. Aside from emissions of GHGs emissions from fossil fuel development, other activities and occurrences contribute to the phenomena of climate change, including large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo) of the earth-atmosphere system.

Ongoing scientific research has identified the potential impacts of anthropogenic GHG emissions and changes in biological sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources

have caused carbon dioxide equivalent (CO₂e) concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The IPCC recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” (IPCC 2007).

It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years. In contrast, black carbon is a relatively short-lived pollutant, as it remains in the atmosphere for only about a week. It is estimated that black carbon is the second greatest contributor to global climate change behind CO₂ (Ramanathan and Carmichael 2008). Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

The extraction of coal in the Bridger underground coal mine results in the release of methane gas from a main exhaust portal, a belt line portal and a mine ventilation shaft. Although it is not a criteria pollutant, methane is a greenhouse gas, approximately 21 times more potent than carbon dioxide in terms of its warming potential. Methane is created during the process of coal formation and remains stored in the coal seams and surrounding rock layers. Shallow coal seams, such as those mined via surface mining operations, contain less methane because there is less pressure due to the overburden (i.e., the rock and soil lying on top of the seam) to keep the methane from escaping. Methane is released to the atmosphere when a coal seam is fractured during surface or underground mining. The amount of methane released by mining depends on the carbon content of the coal, the depth of the coal seam (deeper seams generally contain more methane), and the type of mining being conducted. As mining operations progress into different areas of the mine, it is necessary to vent accumulated methane to the atmosphere to prevent concentrations from building up to levels that could result in underground explosions. The main mine ventilation air system serves this purpose, however, high concentrations of methane may require additional methane ventilation wells to allow methane to be vented to the atmosphere (BLM 2012b).

Methane is vented from coal mines since it can be explosive at concentrations of 5-15% and acts as an asphyxiant at very high concentrations, displacing oxygen. The primary environmental concern over methane venting is its contribution to global greenhouse gas emissions. As methane escapes the enclosed space of the mine through vent shafts and vent wells, the gas is rapidly dispersed and diluted with ambient air. Methane vented from the mine is not expected to affect the local environment because it is considered biologically inert (Committee on Toxicology, Board on Toxicology and Environmental Health Hazards, Commission on Life Sciences, National Research Council, 1984, cited in BLM 2012b). Methane vented to the atmosphere is effectively diluted, removing any concern of oxygen displacement for respiratory animals (BLM 2012b).

On October 30, 2009, the U.S. Environmental Protection Agency (EPA) published a rule for the mandatory reporting of greenhouse gases from large GHG emissions sources in the United States. Implementation of 40 CFR 98 is referred to as the Greenhouse Gas Reporting Program

(GHGRP). 40 CFR 98 applies to direct greenhouse gas emitters, fossil fuel suppliers, industrial gas suppliers, and facilities that inject CO₂ underground for sequestration or other reasons. In general, the threshold for reporting is 25,000 metric tons or more of carbon dioxide (CO₂e) equivalent per year.

The Bridger Coal Company reported the following total equivalent tons of GHG emissions and actual cubic feet (acf) of methane releases for 2011 (IML Air Science 2012):

GHG (tons): 203
CH₄ (acf): 601,504

Based on the quantities reported for 2011, the Bridger Coal Company mine is well below the EPA reporting threshold.

The EPA GHG webpage (EPA 2012) lists the following GHG emissions at the Jim Bridger Power Plant for 2010:

Emissions by Gas in metric tons CO₂e

Carbon Dioxide (CO ₂)	14,767,803
Methane (CH ₄)	35,826
Nitrous Oxide (N ₂ O)	76,934

It may be difficult to discern whether global climate change is already affecting resources in the analysis area. It is important to note that projected changes are likely to occur over several decades to a century. Therefore many of the projected changes associated with climate change may not be measurably discernible within the reasonably foreseeable future. Existing climate prediction models are global or continental in scale; therefore, they are not appropriate to estimate potential impacts of climate change on the planning area. The current state of the science involves calculating potential quantities of greenhouse gases that may be added to the atmosphere from a particular activity. However, tools to analyze or predict how global or regional climate systems may be affected by a particular activity or activities within the planning area are not currently available. Assessing the impacts of greenhouse gas emissions on global climate change requires modeling on a global scale which is beyond the scope of this analysis. Potential impacts on climate change are influenced by greenhouse gas emission sources from around the globe and it is not possible to distinguish the impacts on global climate change from greenhouse gas emissions originating from the planning area (BLM 2012c).

3.2 Cultural Resources

Surrounding Area: The project area is in an area of moderate site density with some potential to contain intact, buried cultural resources. There have been a total of 20 projects inventoried in T21N, R101W, section 3 and T22N, R101W, sections 27 and 34. As a result of the inventories, 12 sites have been previously recorded in these three sections. These sites include 10 prehistoric sites, one historic site and the historic Point of Rocks to South Pass Stage Road. Six of these sites are recommended as eligible for inclusion within the National Register of Historic Places (NRHP), but are located outside of the area of potential effect. The remaining six sites are recommended as not eligible for inclusion within the NRHP.

Project Area: A Class III cultural resource inventory was conducted between June and August 2011 for the proposed project area, covering 960 acres. This inventory resulted in the identification of 17 cultural resources within the project area, including 15 prehistoric sites, one historic site, and a segment of the historic Point of Rocks to South Pass Stage Road.

Two of the prehistoric sites are recommended as eligible for nomination to the NRHP under Criterion D, and the historic Point of Rocks to South Pass Stage Road is considered eligible for the NRHP under Criterion A. The segment recorded in the project area is considered as contributing to the site's overall eligibility for the NRHP. The remaining sites are not recommended as eligible for the NRHP.

Two prehistoric sites on the boundary of the proposed project area are considered not eligible for the NRHP since they do not meet any of the specified criteria; however, as a result of Native American consultation, the sites have been identified as Native American sensitive sites.

3.3 Geology, Geologic Hazards, and Mineral Resources

Geology, Geologic Hazards, and Mineral Resources are discussed in the TMRT EA on pages 62-65 (Geology and Geologic Hazards) and pages 66-70 (Minerals [Solid and Fluid]). The area surface and subsurface geology is described, as is the potential for geologic hazards. The area has low to medium potential for seismic activity; potential for other geologic hazards (landslides, hydrogen sulfide-producing wells, windblown sand, and flood zones) is low.

Coal reserves in the area are in the Fort Union Formation, with the largest seams ranging from 7 to 11 feet in thickness (TMRT EA pg. 66). Although there is moderate potential for oil and gas and coalbed methane in the area, to date no producing wells have been reported. There are no known oil or gas wells on the proposed modification tract (although there is an active lease – see Section 2.2.2). No active locatable mineral mines or construction aggregate quarries are known in the project area.

Underground Mining Subsidence

Bridger Coal has been gathering surface subsidence data since 2006 by using ground surveying and photogrammetric survey flight techniques. The maximum measured amount of ground lowering was approximately 7 feet. To date, there has been no damage to any surface features from the subsidence.

3.4 Socioeconomics

The following discussion is based on the TMRT EA (pages 76-77) but updated with recent data.

The proposed lease modification is located in Sweetwater County. From 2000 to 2011, Sweetwater County's population increased 17.4%, from 37,613 to 44,175 (U.S. Department of Commerce [USDOC] 2000, 2012a). Total employment (number of jobs) in Sweetwater County in 2010 was 29,611. Mining (including fossil fuels) constitutes the largest employment sector, employing 5,754 (19.4% of the workforce). Government was the second largest employment sector, employing 4,816 (16.3% of the workforce). Retail Trade employed 2,962 (10.0%),

followed by Accommodation and Food Services at 2,300 (7.8%); and Construction at 2,258 (7.6%) (Economic Profile System-Human Dimensions Toolkit 2012).

The most recent Sweetwater County unemployment rate (June 2012) was 4.9% of a 25,542-person labor force (Wyoming Department of Workforce Services 2012). The 2010 vacancy rate for Sweetwater County was 12.1% (USDOC 2012b).

Rock Springs is the closest city to the project area. Most of the BCC workforce likely resides in Rock Springs. The 2011 estimated population for Rock Springs was 23,229, a 0.8% increase from April 2010 (USDOC 2012c). The 2010 vacancy rate for Rock Springs was 12.9% (USDOC 2012d).

Coal mined at the Jim Bridger Mine is used to generate electricity at the Jim Bridger Power Plant. The power plant is capable of generating 2,120 megawatts (MW) of electricity and is the largest coal-fired power plant in PacifiCorp's or Idaho Power's system. The power plant is connected to the western power grid through a series of transmission lines. The western power grid provides electricity to 13 western states, the provinces of British Columbia and Alberta, and a portion of northern Mexico (BLM 2004).

The coal mined at the Jim Bridger Mine is transported less than 10 miles to the power plant; resulting in lower costs for electricity produced at the power plant.

3.5 Water Resources

The following discussion is based on the TMRT EA; that EA is incorporated by reference in these materials. The discussion here is modified for applicability to the coal lease modification as well as updated for changes in stream classification that have occurred since TMRT EA analysis was completed. The Environmental Effects section also includes changes in mining impacts since the preparation of the TMRT EA, and additional data to describe the environment and clarify impacts. A large portion of the water resource discussion presented below is extracted from Bridger Coal Company, 2003; BLM, 2004; Ogle, Calle', and Wood, 2005; and Ogle and Kunze, 2008.

3.5.1 Surface Water Resources

The lease modification area lies within the general area assessed in the TMRT EA: the Great Divide Basin and Upper Deadman Wash watersheds. There are no perennial or intermittent streams or springs within the proposed lease modification area. Deadman Wash becomes a perennial stream below the Jim Bridger Power Plant; however, that change in flow characteristics is attributed to seepage from the surge pond supplying water to the Jim Bridger Power Plant rather than natural conditions. The northern part of the lease modification area is drained by Black Rock Creek and tributaries, which drain into the Great Divide Basin, a closed basin that does not flow out of Wyoming. The southern part of the lease modification area is drained by Tenmile Draw and tributaries which drain to Bitter Creek (Figure 3.2).

While no data are available for Black Rock Creek and its tributaries, flow characteristics and water quality are expected to be similar to that of nearby Deadman Wash. Baseline data collected by the Bridger Coal Company and the USGS illustrate the ephemeral nature of the streams in the area. A downstream gauge, USGS Station No. 09216550 on Deadman Wash near Point of Rocks, measured peak discharges from 1961 to 1981. During that time frame, peak discharge at the gauge varied from 86 cubic feet per second (cfs) on June 18, 1975 to 1,320 cfs on August 9, 1979. The August 9th event was a noteworthy large general storm which included peak events at other gauges in the area and washed out the gauge on Lower Ten Mile Rim Draw.

The surface water that flows within Deadman Wash is highly variable in quality depending on the nature of the runoff. Runoff from snowmelt usually generates lower concentrations of total dissolved solids (TDS) and total suspended solids (TSS) than runoff from rainfall storm events. A strong linear relation between TSS concentration and instantaneous discharge has been documented at USGS gauge stations on Bitter Creek, with TSS concentration increasing with increased flow. The TDS concentration averages about 3,300 milligrams per liter (mg/l), pH readings average approximately 7.9 Standard Units (SU), and bicarbonate concentrations average approximately 290 mg/l. As a point of reference, the average water quality of Deadman Wash meets WDEQ-WQD groundwater standards for livestock class of use (Class III) (Bridger Coal Company 2003).

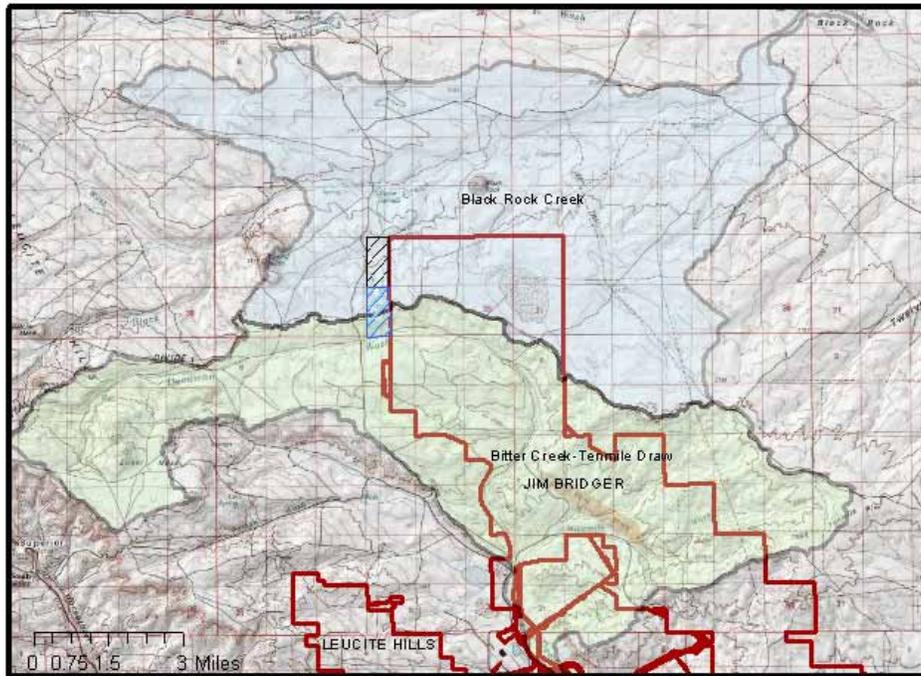
Black Rock Creek is classified as a 3B waterway (WDEQ-WQD 2001). A stream classified 3B has use designations of other aquatic life, recreation, wildlife, agriculture, industry and scenic value, but does not have a use designation of drinking water, game fish, non-game fish or fish consumption.

There are no known springs in the lease modification area. Rador Springs, as well as several unnamed springs, are located approximately one mile north of the lease modification area. Monitoring of the springs is a requirement of the mining permit for the Jim Bridger Mine.

3.5.2 Groundwater Resources

Groundwater within the lease modification area and vicinity is contained in several aquifers. Alluvial aquifers are found in some of the surface drainage channels and aquifers of the Fort Union Formation (Paleocene), Deadman coal zone within the Fort Union Formation, Lance Formation (Cretaceous), and the Ericson Sandstone (Late Cretaceous).

The Fort Union Formation is capable of a sustainable yield of approximately one gallon per minute. The upper Lance Formation, located below the Fort Union Formation, is classified as an aquitard, even though it is a water-bearing formation. In some areas, the Continental Divide appears to affect the potentiometric surface of these aquifers; however, in general the regional groundwater flow is in a northeasterly direction (Bridger Coal Company 2003). The proposed underground mine extension would intercept groundwater contained in the Deadman coal zone of the Fort Union Formation and leakage from surrounding sediments. The Fort Union Formation is approximately 1,500 feet (ft) thick in the area of the lease modification area.



Surface Water Drainages

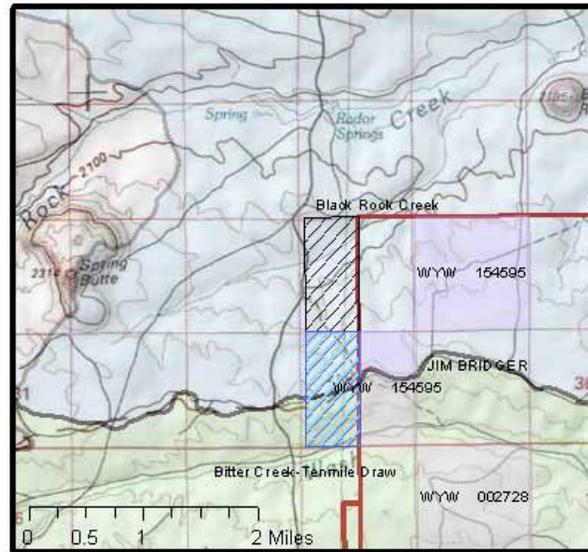


Location in Wyoming

Legend

-  Application Area for Lease Modification
-  Additional Private Coal to be Mined
-  Upper Tenmile Draw Drainage
-  Black Rock Creek Drainage
-  Federal Coal Lease with Serial Number
-  Wyoming Coal Mine Permit Areas as of February 2011

This figure is meant for orientation only. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregated use with other data.



Close-up of Lease Modification in Relation to Drainages

Figure 3.2. Illustration of the proposed lease modification area in relation to the surface water drainages, Green River Basin, Wyoming, 2012

Except for water used by Bridger Coal Company for exploration drilling, there are no known groundwater appropriations (i.e., water rights) issued by the Wyoming State Engineer's Office (WSEO) for use of groundwater from the Deadman coal zone aquifer within the vicinity of the lease modification area. Bridger Coal Company has appropriations for groundwater rights for portions of the Deadman coal zone aquifer located within the existing surface mining operation (Bridger Coal Company 2003).

The groundwater quality from wells within the Bridger Coal Company mine area of the Deadman coal zone aquifer indicates an average TDS of 1,711 mg/l, bicarbonate of 664 mg/l, and sulfur of 656 mg/l. The pH of the groundwater averages approximately 8.0 SU. Average water quality of the Fort Union aquifer meets WDEQ-WQD standards for agricultural use (Class II) (WDEQ-WQD 1993; Bridger Coal Company 2003).

The closest surface expression of groundwater is at Rador Springs, and some unnamed springs in the same area, approximately one mile northwest of the proposed modification tract (Figure 3.2).

The Ericson Sandstone is located approximately 2,400 ft below the surface. The Ericson Sandstone is a member of the Mesaverde Group and is composed primarily of sandstone with some shale lenses and is approximately 600 ft thick in the general area. The Ericson Sandstone dips approximately 3 to 4 degrees to the northeast. It is estimated that the Ericson Sandstone in this area has a transmissivity of 14,000 gallons/day/foot (1,872 ft²/day) and a storage coefficient of 8×10^{-4} (Hoffman 2004a). The Bridger No. 1 well is completed in the Ericson Sandstone.

Water from the underground mine workings, as well as production from the Bridger No. 1 well, is used for dust suppression, washing equipment, and other industrial requirements associated with mining. When underground mining commenced, sufficient water was produced from the mine workings that withdrawals from the Bridger No. 1 well were less than anticipated. Prior to opening the underground mine workings, the water for operation of the Jim Bridger Power Plant was provided via a pipeline from the Green River. As the underground mine continues to develop, excess water production not required for the mining operations is treated and put to beneficial use at the Jim Bridger Power Plant, replacing a portion of water from the Green River. The water from the underground mine workings is processed through the mine's water treatment facility, as needed. The specific mix of water sources varies depending on the geology encountered in the underground mine workings and the mine operations.

The Town of Superior has drilled, completed, and operates two water wells in the Ericson Sandstone updip of the TMRT area and the Bridger No. 1 well. Both of these wells are located in NE $\frac{1}{4}$ of Section 26, T21N, R101W, approximately 15,000 ft south of the TMRT area. These wells are the primary (but not sole) source of drinking water for the community. Superior No. 17 well is approximately 1,070 ft deep and has a pumping capacity of 150 gallons and Superior No. 18 well is approximately 1,700 ft deep and has a pumping capacity of 350 gallons per minute. A third well (Superior No. 19) at the same location was drilled and completed into the Almond Formation (Cretaceous) (located above the Ericson Sandstone). This well should not be impacted by either mine dewatering operations or by the operation of the Bridger No. 1 well; therefore, no further discussion on this well is included in this analysis.

3.5.3 Wetlands/Riparian Areas

A jurisdictional wetland inventory of the TMRT area was completed in 2002 and determined that there are no jurisdictional wetlands within the lease modification area (Intermountain Resources 2002). While the inventory has been completed, it has not been formally submitted to the U.S. Army Corps of Engineers for a formal review and determination.

4.0 ENVIRONMENTAL EFFECTS

Consistent with 40 CFR 1502.16, this chapter discusses the potential environmental consequences associated with the Proposed Action and No Action Alternative on each of the affected resources. An environmental impact is defined as a change in the quality or quantity of a resource due to modification of the existing environment due to the new activity. Impacts may be beneficial or adverse, direct or indirect, and may be permanent, long term, or temporary. This impact assessment assumes any applicant committed measures described in the Proposed Action would be successfully implemented.

4.1 Direct and Indirect Effects

4.1.1 Air Quality/Global Climate Change

4.1.1.1 Air Pollutant Concentrations

Alternative I – No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and no additional impacts to air quality other than those already authorized in the project area would occur. If the Proposed Action is not implemented, the Bridger Power Plant would obtain coal from other sources and would continue to operate at current levels. Air quality impacts would not be expected to change from current conditions.

Alternative II – Proposed Action

Air emissions and air pollutant impacts are limited by state and federal regulations, standards, and implementation plans established under the Clean Air Act as administered within the State of Wyoming by WDEQ-AQD. All proposed air pollutant emission sources, including coal mining operations, are required to undergo a permitting review and are required to obtain, prior to construction, applicable air quality permits. No additional surface disturbance or construction activity would result from the Proposed Action; therefore, it is not expected that additional WDEQ-AQD construction and operating permits would be required. The Bridger Mine would be required to operate in compliance with emissions and ambient air quality standards identified in their approved WDEQ-AQD permits.

Employees would continue to travel to work via Wyoming State Highway 377 and Sweetwater County roads 4-15 and 4-17 and existing unpaved access roads at an estimated rate of 250 round-trips per day (TMRT EA). PM₁₀ emissions from employee travel were estimated in the TMRT EA to be 0.41 tons per day or 150 tons per year. The Proposed Action would extend this impact for up to approximately one year. Mobile sources of emissions are not subject to state or federal air quality permitting requirements.

The use of various diesel and gasoline powered equipment would continue if the Proposed Action were chosen. Air pollutant emissions associated with these mobile sources include PM₁₀, NO_x, SO₂, CO, and VOCs as a result of diesel combustion in this underground equipment. Fugitive dust emissions would be limited by the natural moisture content of the underground traveled surface, supplemented by water application as necessary. The underground mine would intake and exhaust air from the mine portal at a rate consistent with current operations.

Under the Proposed Action, the mine would continue to load a maximum of 6 million tons of coal per year to the existing overland conveyor originating from the underground mine. The conveyor transports this coal to the existing Truck Dump Station #2 for further transport to the Jim Bridger Power Plant via another existing overland conveyor. This coal is sprayed with water or dust suppressant to reduce dust emissions. Under the Proposed Action, emissions at permitted levels would be expected to continue for up to approximately one year beyond the end of currently approved mining activity.

Fugitive dust from vehicle travel on unpaved roads and disturbed areas around the mine and power plant would continue to be controlled by treatment with water and chemical dust suppressants consistent with WDEQ requirements. No exceedances of ambient air quality standards or Class II Prevention of Significant Deterioration Increments are expected to occur as a result of implementing the additional underground mining activities described in the Proposed Action.

Implementing the Proposed Action is expected to extend previously disclosed impacts to local air quality for up to approximately one year. More details on expected air quality impacts as a result of underground mining operations at the Bridger Mine can be reviewed in the TMRT EA (pages 116 to 122).

4.1.1.2 Greenhouse Gases/Climate Change

Alternative I – No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and no additional impacts to greenhouse gases emissions other than those already authorized in the project area would occur.

Alternative II – Proposed Action

The tools necessary to quantify climatic impacts from projects such as a lease modification are presently unavailable. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing factors that contribute to climate change.

Wyoming's gross GHG emissions are expected to continue to grow to 69 MMtCO₂e by 2020, 56% above 1990 levels. Generation of electricity is projected to be the largest contributor to future emissions growth, followed by emissions associated with transportation. Although GHG emissions from fossil fuel production had the greatest increase by sector in the period 1990 to 2005, the growth from this sector is projected to decline due to the assumption of decreased carbon dioxide emissions from venting at processing plants.

The natural gas industry is the major contributor to both GHG emissions and emissions growth, with CH₄ emissions from coal mining second, although only minor methane emissions are expected to result from underground coal mining under the Proposed Action. As noted in the Affected Environment section, the underground mine reported 203 tons (601,504 acf) of methane gas released in 2011, well below EPA's required reporting threshold (IML Air Science 2012). This amount is expected to continue under the Proposed Action.

Although no GHG inventory has been completed for the lease modification area, it is estimated that as a result of implementing the Proposed Action, the emissions from the Bridger Coal Mine Complex would be expected to continue at the current rate for an additional year.

Consistent with current permitting, the coal that would be mined as a result of this proposed modification would be expected to contribute approximately 6.25 million metric tons of CO₂ as a result of burning and producing electric power at the Bridger Power Plant. The Proposed Action is not likely to change the level of air quality emissions from Jim Bridger Power Plant because other, although possibly more costly, coal sources could be utilized by the plant. Changes in emission levels from the power plant are more likely to occur in response to changes in emissions regulations. Therefore implementing the Proposed Action is not expected to add to GHG emissions and would not be expected to have a measureable contribution to global climate change.

4.1.2 Cultural Resources

Alternative I – No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and no additional impacts to cultural resources other than those already authorized in the project area would occur.

Alternative II – Proposed Action

Of the two prehistoric sites that are considered eligible for the NRHP, as a result of archeological testing, the portion of one of these sites that is located within the area of potential effect is considered to be non-contributing. Thus, the project would not adversely affect any of the qualities that make this site eligible for the NRHP. The other NRHP-eligible prehistoric site and the segment of the Point of Rocks to South Pass Stage Road within the area of potential effect may potentially be adversely affected as a result of the subsidence from the underground mining operation or in the event that emergency or non-emergency mine shafts, vents, or drill holes need to be installed. The potential adverse effects to these two sites would be mitigated through an amendment to the existing Memorandum of Agreement between the BLM, Wyoming State Historic Preservation Office (SHPO), OSM, WDEQ, and BCC regarding effects to historic properties for the current underground mine.

The two prehistoric sites that were identified as Native American sensitive sites would not be adversely impacted as they would be avoided by any physical ground disturbance. The BLM consulted with the SHPO and the SHPO concurred with the BLM's determinations.

4.1.3 Geology, Geologic Hazards, and Mineral Resources

Alternative I – No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and no additional impacts to geology, geologic hazards, or mineral resources other than those already authorized in the project area would occur. The potential for geologic hazards, including subsidence, occurring within the project area would remain low to moderate.

Alternative II – Proposed Action

The primary impact to geology, geologic hazards, or mineral resources resulting from implementation of the Proposed Action would be the removal of an additional up to 5.7 million tons of in-place federal coal resources. The coal mining of the additional 320 acres for the lease modification is expected to add production for approximately six months to one year, based on the mine's current (variable) annual production of up to 6 million tons per year.

The federal oil and gas lease was issued with a condition stipulating that a plan for mitigation of anticipated impacts to coal mining operations is developed between the oil and gas and the coal lessees and the plan is subject to the approval of the authorized officer.

More details on expected direct and indirect impacts to geology, geologic hazards, and mineral resources as a result of underground mining operations at the Bridger Mine can be reviewed in the TMRT EA (pages 127-131).

Underground Mining Subsidence

Under the Proposed Action there would likely be a permanent lowering of surface elevation estimated to range from 6.0 to 9.5 feet. Upon completion of mining operations, the surface would gradually settle over mined areas for about a 2-year period. Typically subsidence effects are localized to within 50 feet of the mined areas in similar mine conditions (U.S. Department of Energy 1995, cited in BLM 2004). Subsidence would not occur over the main or sub-main entries as they are designed to last beyond the life of the project. Because the induced slopes of the ground are low angle, only a gradual change in the subsidence profile is anticipated. This type of profile does not normally create the bending stresses which induce damage. Due to the nature of the overburden above the coal, surface cracking is minimized, or possibly eliminated, which in turn minimizes the threat of damage to surface features such as roads and fences.

Since the area's topography is naturally undulating, it is unlikely that the subsidence would be particularly noticeable to the average user. Lastly, since the surface of the proposed 320-acre lease modification tract is not being utilized outside of casual intermittent use and no constructed facilities are present or planned, there would be no adverse effect. Additional information about subsidence can be reviewed in the TMRT EA (pages 127-131).

4.1.4 Socioeconomics

Alternative I – No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and no additional positive impacts to socioeconomics other than those already authorized in the project

area would occur. The Bridger Power Plant would seek other, likely non-local, sources of coal to maintain production. The area would not receive the economic benefits (state and federal royalties and continuation of employment for the approximately 50 miners) for the additional six months to one year of underground coal mining that would occur under the Proposed Action. Additionally, it would be more difficult and expensive for BCC to access coal reserves in the adjacent private lands, which would likely increase the cost of power generation at the power plant. These additional costs would be passed on to utility consumers in the form of higher energy prices.

Alternative II – Proposed Action

Expanding the area of underground coal mining would allow the Bridger Mine to extend present production and employment levels for an additional year, resulting in continued economic benefits to the area. In addition to the approximately 50 miners that would have an additional year of employment, according to the 3.0 multiplier used in the TMRT EA, an estimated additional 150 jobs would benefit from the additional year of production. While it is anticipated that most of the workforce needed to support the Proposed Action is already employed at the mine, if there were some turnover (estimated at no more than 20%), there is a sufficient labor force available in Rock Springs to meet additional demand. Existing infrastructure in Rock Springs and Sweetwater County (e.g., schools, utilities, hospitals, etc.) is sufficient to accommodate the continued workforce.

The Proposed Action would continue to provide revenue to the state and federal government in the form of royalty payments for the up to 5.7 million tons of mineable coal. Additionally, the Proposed Action would make mining of the adjacent areas of private coal reserves more economical, resulting in additional royalties and additional continuation of mining and service industry employment.

The Proposed Action would provide the lowest transportation cost of coal to supply the power plant, leading to less expensive generation of electricity for customers of the Bridger Power Plant.

4.1.5 Water Resources

4.1.5.1 Surface Water Resources

Alternative I – No Action Alternative

Under the No Action Alternative, the coal lease modification would not occur and no underground mining operations would be conducted within the lease modification area. There would be no additional impacts other than those already authorized in the project area, and impacts to surface water resources would continue at current rates. Currently, impacts to surface water resources are addressed through alternative sediment control techniques and the mine conducts an extensive monitoring network to assure the effectiveness of those techniques. The mine also holds Wyoming Pollution Discharge Elimination System Permits which would allow them to discharge to surface waters, if needed, when the standards could be achieved.

Alternative II – Proposed Action

The Proposed Action would not result in any new surface disturbance and minimal to no impact to surface water resources is anticipated. There would be no depletion of surface water resources and no perennial streams would be directly impacted by subsidence induced by the underground mining activities.

While there are no surface streams, ephemeral channels could have limited head-cutting or ponding as a result of subsidence. Short-term control of surface runoff, if needed, would be accomplished by implementation of alternate sediment control measures required by the WDEQ-Land Quality Division (LQD) and as described in the mine plan. Long-term control of surface runoff would be accomplished by successful implementation of the reclamation plan in the associated mine plan.

Excess mine water from this lease modification would be handled in the same manner as excess mine water is currently. Water not needed for dust suppression would be pumped into an existing WDEQ-LQD- and WDEQ-WQD-approved holding pond where the water would be monitored and either used in the Jim Bridger Power Plant or treated at the mine's water treatment facility. This activity would be conducted as part of ongoing mine dewatering operations conducted at the Jim Bridger Mine and in accordance with BCC's existing WYPDES discharge permit issued by WDEQ-WQD.

No drainages within the lease modification area or surrounding area are included in the WDEQ-WQD 303(d) list of water bodies with water quality impairments (WDEQ-WQD 2012). This list includes rivers, streams, creeks, or any water bodies of water for which effluent limitations required by the federal Clean Water Act, as amended, are not stringent enough to implement any water quality standards applicable to such waters.

4.1.5.2 Groundwater Resources

Alternative I – No Action Alternative

Under the No Action Alternative, the coal lease modification would not occur and impacts to groundwater resources would continue at current rates. Bridger Coal Mine would continue to produce water from the underground mine workings. The mine could meet any water shortage with groundwater from the Bridger No.1 well. Excess amounts of water from the underground mine workings can either be stored in a WDEQ-LQD pond or treated and used at the Jim Bridger Power Plant.

Alternative II – Proposed Action

Underground coal mining within the proposed lease modification area would have little, if any, short-term or long-term effect on the regional hydrologic regime. It is anticipated that mining operations would intercept groundwater contained within the Deadman coal zone of the Fort Union Formation and seepage from surrounding sediments. Groundwater intercepted by mining operations in excess of what could be left within the mine would be pumped out through the mine portal. If the water is not needed for dust suppression or equipment washdown, it would be treated at the mine's water treatment facility.

Under the current mining operation, BCC requires an estimated 100,000 to 500,000 gallons of water per day from the Deadman coal zone for dust suppression, equipment washdown and for surface support facilities. In addition, approximately 6,000 acres of coal aquifer (the same one that would be mined) would be temporarily removed during mining. However, while temporary, it may require 100 years or more for postmining groundwater levels to recharge to pre-mine levels (BCC 2003).

Drawdown of the coal aquifer would occur throughout the life of the mine and would likely mimic groundwater drawdown patterns currently observed as a result of BCC's current underground and surface coal mining operation. The drawdown limit of the Deadman coal zone would likely continue to extend west of the existing surface mine operation. In addition, a limited amount of drawdown would also occur in the Lance Formation and Fort Union Formation overburden. The amount of drawdown would depend upon numerous hydrogeologic factors including the amount of hydraulic connectivity between the various formations.

BCC applied for and obtained groundwater rights from the WSEO for the groundwater resource that would be impacted by the proposed lease modification. There are no known groundwater appropriations within the vicinity of the lease modification area, except those currently held by BCC. However, in accordance with WSEO regulations and Wyoming state law, if it is determined that groundwater drawdown from mining operations has affected any pre-existing appropriated groundwater right, BCC would be required to provide said water right holder(s) with an alternative source of water.

After mining operations have been completed and subsidence has begun, there might be changes in the Fort Union Formation and the Lance Formation aquifers due to interruption and deformation of strata located near the mined out longwall panels. The amount and extent of aquifer changes would depend upon numerous hydrogeologic factors, including the extent of fractures and their ability to seal themselves. For western underground coal mines, the relationship of fracture height is predicted to be equal to on Formation overburden aquifer, the replaced Deadman coal zone aquifer, and 30 times the height of the coal that was removed (Kadnuck 1994). Assuming approximately 7 to 11 feet of coal would be removed during mining, this relationship predicts that a majority of the fracturing would occur approximately 210 to 330 feet above the mined longwall panels within the project area. Above this interval, continuous bending of strata generally occurs and pre-existing fractures can dilate (i.e., swell or expand) and would likely result in limited groundwater flow variations to the natural system (Kadnuck 1994).

In addition, after mining operations are completed, affected aquifers would be physically replaced with existing overburden material as subsidence occurs and the void created by longwall mining is eliminated. Affected aquifers would then begin to resaturate as postmining potentiometric elevations recover in the surrounding undisturbed aquifers. The recharge rate would depend on the specific physical characteristics of the replaced aquifer (Deadman coal zone) and the indirectly impacted aquifers (the Fort Union Formation and the Lance Formation). While it may require 100 years or more for postmine groundwater levels to recharge to premine levels (BCC 2003), aquifer drawdown would not be permanent and the affected aquifers would eventually be reestablished.

Groundwater quality in the postmining subsidence aquifer would likely contain higher levels of calcium, sulfate, magnesium, manganese, and TDS than premining waters because infiltrating water would flow across relatively fresh-cut rock faces where newly exposed minerals would be readily dissolved (Rahn 1976; Van Voast 1978). The premining groundwater quality is generally suitable only for agricultural use, livestock and wildlife watering, and industrial purposes. Postmining groundwater quality would be similar to premining conditions and could, in some situations, change from Class II (agricultural use) water to Class III (livestock and wildlife watering use) water.

The closest surface expression of groundwater is at Rador Springs, approximately 1 mile northwest of the project area. However, based upon the slope of the coal beds that would be impacted by the Proposed Action and knowledge gained at the existing Jim Bridger Mine and local geologic maps, the proposed underground mine would be located down-gradient of Rador Springs and most likely is not connected to Rador Springs and would not impact Rador Springs (BLM 2002).

Potential impacts of the Proposed Action (specifically the operation of the Bridger No. 1 well) on the two existing Superior water wells located south of the TMRT area were assessed. As a worst case scenario (500,000 gallon/day), the estimated zone of influence of the drawdown from the Bridger No. 1 well was computed using a five-foot drawdown based on a transmissivity of 14,000 gallons/day/foot, a storage coefficient of 8×10^{-4} , assumed uniform and isotropic conditions within the Ericson Sandstone, and an average pumping rate of 200 gallons per minute for 18 years. The Theis method (Watson and Burnett 1995) was utilized to determine the radius of the potential drawdown and indicates that at the end of the 18-year period, the five-foot drawdown zone would extend approximately 5 miles around the Bridger No. 1 well and would include the three existing Superior water wells. Based on this worst case scenario, it is estimated that there could be an 8.2-foot decrease in the water level of the two Superior water wells at the end of the 18-year period. This decrease would be cumulative to the existing cone of depression created as a result of the normal operation of the two Superior water wells (Hoffman 2004a.). No significant change to this projection is anticipated due to mining in the lease modification area.

Information about Superior No. 17 well indicates that the static water level is 40 feet below ground level and the pump is set at 231 feet below ground level. Pump test data for this well indicates that the water level normally drops to 70 feet below ground level during pumping (Hoffman 2004b). Based on the worst case scenario, the pumping level within the Superior No. 17 well at the end of the 18-year period would be reduced to approximately 78 feet below ground level (70 feet + 8.2 feet). This would be about 153 feet above the depth where the pump is set (the pump is set at 231 feet below ground level). Therefore, minimal interference would be expected and no impact on production capacity of Superior No. 17 well would be expected. At the end of the 18-year pumping period, the static and pumping water levels would eventually return to pre-mining conditions. Information about Superior No. 18 well indicates that the static water level is 31 feet below ground level and the pump is set at 300 feet below ground level. Pump test data for this well indicates that the water level normally drops to 114 feet below ground level during pumping (Hoffman 2004b).

Based on the worst case scenario, the pumping level within the Superior No. 18 well at the end of the 18-year period would be reduced to approximately 122 feet below ground level (114 feet + 8.2 feet). This level would be about 178 feet above the level where the pump is set (the pump is set at 300 feet below ground level). Therefore, minimal interference would be expected and no impacts on the production capacity of Superior No. 18 well would be expected. At the end of the 18- year pumping period, the static and pumping water levels would eventually return to pre-mining conditions. The operation of the Bridger No. 1 water well would not have any impacts on the quality of water coming from the two existing Superior water wells (Hoffman 2004c).

4.1.5.3 Wetlands/Riparian Areas

Alternative I – No Action Alternative

Under the No Action Alternative, the coal lease modification would not occur, no additional underground mining operations would be conducted within the lease modification area (beyond the existing mining and other industrial development), there would be no additional development in the proposed project area, and impacts to wetlands/riparian areas would continue at current rates.

Alternative II – Proposed Action

There are no riparian areas within the project area. Based on the results of a wetland inventory, there are no jurisdictional wetlands located within the TMRT project area (Intermountain Resources 2002). Therefore, the Proposed Action would not be expected to have any impacts on wetland resources. However, during the mine permitting process, the U.S. Army Corps of Engineers would complete a review of the wetlands inventory report and would make a formal determination as to the jurisdictional status of any potential wetland resource. Only the U.S. Army Corps of Engineers has the legal responsibility and authority to make determinations for jurisdictional wetlands within the project area. No additional permitting requirements or mitigation measures are necessary, assuming the U.S. Army Corps of Engineers formally determines that there are no legal jurisdictional wetland areas.

On the other hand, if the U.S. Army Corps of Engineers determines that jurisdictional wetlands are present within the lease modification area, BCC would prepare the appropriate information and would likely obtain coverage under an existing nationwide permit from the U.S. Army Corps of Engineers. BCC would also incorporate any necessary and appropriate wetland reclamation plans for this area into their mine and reclamation permit application that would be reviewed and approved by WDEQ-LQD. Therefore, if jurisdictional wetland areas are identified, permitted, and impacted by the Proposed Action, proper reclamation procedures would ensure that these areas are reclaimed and revegetated in accordance with WDEQ-LQD and U.S. Army Corp of Engineers rules and regulations.

4.2 Cumulative Effects

Cumulative impacts result from the incremental effects of the action added to other past, present and reasonably foreseeable future actions, regardless of who is responsible. Cumulative impacts may result from individually minor, but collectively significant actions occurring over a period

of time. An approximate 1-mile radius was used to define the boundary for the cumulative impact analysis area (CIAA) for each resource presented in this EA, except for Air Quality/Global Climate Change, for which a 10-mile radius was used.

Past, present, and reasonably foreseeable future activities within the CIAA include cattle and sheep grazing; hunting; dispersed recreation; exploratory drilling for coal in support of the Bridger Underground Mine; underground coal mining on adjacent state, federal and private parcels (Bridger Underground Mine); and scattered oil and gas exploration activity. For most resources, since the area is undeveloped with little existing or planned developments, cumulative effects would be essentially the same as the direct and indirect effects discussed above.

4.2.1 Air Quality/Global Climate Change

4.2.1.1 Air Pollutant Concentrations

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

The Bridger Coal Mine has been operating since 1974. Other existing emission sources in the area include the Leucite Hills coal mine (approximately 1,772 acres), additional parcels of state and private land leased for the Bridger Underground Mine, and scattered oil and gas developments.

Cumulative impacts are expected to be much the same as those described in the TRMT EA and Pit 14 FEIS, resulting in the mining of up to an additional 5.7 million tons of mineable coal extending predicted impacts for up to approximately one year.

The Final Environmental Impact Statement (EIS) for the GRRMP (BLM 1996) identified the parcels in this proposed lease modification as part of the areas likely to be disturbed by coal mining development (Map 3, *Coal/Sodium Potential*). Table 4-2, *Activities Which Affect Air Quality and Typical Emission Factors for Each* (pg. 459) identifies expected PM₁₀ and Total Suspended Particulates (TSP) impacts from Coal Mining. Table 4-3, *Major Air Pollution Emission Sources* (pg. 460) lists the Bridger Power Plant's 1991 actual emission rates in tons per year. The document discusses expected cumulative impacts of these activities on air quality (pg. 417-418). Impacts from the proposed lease modification would not be expected to exceed the impacts discussed in the Final EIS.

4.2.1.2 Greenhouse Gases/Climate Change

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

At this time, there is no national policy or law in place that regulates GHG emissions. Therefore climate change analysis in this EA is limited to accounting for and disclosing of factors that contribute to climate change. To the extent that emission data were available or could be inferred from representative type data, potential GHG emissions that could result from development of the proposed modification have been identified.

It is not yet possible to associate specific actions with specific climate impacts. It is assumed that coal mining will proceed in accordance with permit conditions. Since tools necessary to quantify incremental climatic changes associated with GHG emissions are presently unavailable, the analysis cannot reach conclusions as to the magnitude or significance of the emissions on climate. However, if placed in the context of other GHG emissions, the GHG emissions associated with the proposed lease modification would not significantly contribute to climate change.

The *Climate Change Supplementary Information Report for Montana, North Dakota, and South Dakota Bureau of Land Management* describes impacts of climate change in detail at various scales, including the state scale when appropriate (URS 2010).

The following bullet points summarize potential changes identified by the EPA that are expected to occur at the regional scale, where the proposed action and its alternatives are to take place (EPA 2008):

- The region is expected to experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations, leading to less snow.
- Earlier snowmelt means that peak stream flow would be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs would be drier.
- More frequent, more severe, and possibly longer-lasting droughts are expected to occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions would reduce the range and health of ponderosa and lodge pole pine forests, and increase susceptibility to fire. Grasslands and rangelands could expand into previously forested areas.
- Ecosystems would be stressed and wildlife such as the mountain lion, black bear, longnose sucker, marten, and bald eagle could be further stressed.

Other impacts could include:

- Increased particulate matter in the air as drier, less vegetated soils experience wind erosion.
- Shifts in vegetative communities which could threaten plant and wildlife species.
- Changes in the timing and quantity of snowmelt which could affect both aquatic species and agricultural needs.

Projected and documented broad-scale changes within ecosystems of the U.S. are summarized in the *Climate Change Supplementary Information Report* (URS 2010). Some key aspects include:

- Large-scale shifts have already occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue (U.S. Global Change Research Program 2009, cited in URS 2010).
- Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to 2 weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.
- Fires, insect epidemics, disease pathogens, and invasive weed species have increased and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
- Insect epidemics and the amount of damage that they may inflict have also been on the rise. The combination of higher temperatures and dry conditions have increases insect populations such as pine beetles, which have killed trees on millions of acres in western U.S. and Canada. Warmer winters allow beetles to survive the cold season, which would normally limit populations; while concurrently, drought weakens trees, making them more susceptible to mortality due to insect attack.

While long-range regional changes might occur within this project area, it is impossible to predict precisely when or where they could occur. The following example summarizing climate data for the West North Central Region (Montana, North Dakota, South Dakota, and Wyoming) illustrates this point at the regional scale. A potential regional effect of climate change is earlier snowmelt and associated runoff. This is directly related to spring-time temperatures. Over a 112 year record, overall warming is clearly evident with temperatures increasing 0.21 degrees per decade. This would suggest that runoff may be occurring earlier than in the past. However, data from 1991-2005 indicates a 0.45 degree per decade cooling trend. This example is not an anomaly, as several other 15-year windows can be selected to show either warming or cooling trends. Some of these year-to-year fluctuations in temperature are due to natural processes, such as the effects of variations in sea surface temperatures (for example El Niños, La Niñas, the Pacific multidecadal oscillation and Atlantic multidecadal oscillation, and the eruption of large volcanoes) (URS 2010). This information illustrates the difficulty of predicting actual regional or site specific changes or conditions which may be due to climate change during any specific time frame.

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the lease modification and subsequent mining and combustion of up to 5.7 million tons of coal on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level.

4.2.2 Cultural Resources

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

Ground disturbance from oil and gas development, livestock grazing, and off-highway vehicle use within the area would lead to disturbance of vegetation cover and increase the possibility of increased erosion of buried soils, possibly leading to increased displacement of cultural materials associated with recorded cultural resources as well as the exposure of undocumented buried cultural materials in the vicinity.

4.2.3 Geology, Geologic Hazards, and Mineral Resources

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no additional cumulative effects to geology, geologic hazards, or mineral resources other than those already authorized in the project area would occur.

Alternative II – Proposed Action

In addition to the removal of the approximately 5.7 million tons of in-place federal coal resources under the Proposed Action, BCC intends to mine nearby private parcels. Mining of the adjacent parcels would add an additional 1-2 years of production for the power plant, and result in the removal of 3-7 million tons of coal resource from private land. The risk of geologic hazards would remain the same.

Underground Mining Subsidence

Mining of adjacent private parcels would add to the areas of subsidence that would occur under the Proposed Action. Subsidence would likely occur over a 2-year period upon completion of mining operations. As described earlier, because of the gentle topography of the area, subsidence would be unlikely to induce damage or be particularly noticeable, and due to the undeveloped nature of the area, no adverse effects to surface facilities would occur.

4.2.4 Socioeconomics

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no cumulative effects greater than those already discussed.

Alternative II – Proposed Action

Under the Proposed Action, as noted above, there would be continuation of mining employment and service industry jobs, continuation of royalty payments and lower costs for electricity generation. There are no known adverse impacts that would occur.

4.2.5 Water Resources

4.2.5.1 Surface Water Resources

Alternative I – No Action Alternative

Under the No Action Alternative, there would be no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

The CIAA for the surface water resources lies within the area already addressed in the TMRT EA and includes the adjacent areas of private coal that would be mined if the Proposed Action is approved (Figure 2.1). Based on the disturbance calculations presented in Chapter 3 of the TMRT EA, approximately 6,308 acres are currently disturbed within the CIAA. This represents 8.07% of the total area within the CIAA. Existing surface mining operations at the Jim Bridger Mine would likely result in more cumulative impacts to surface water resources than any other activity within the CIAA. Impacts include the temporary reduction of surface water flow and potential impacts to surface water quality.

However, all mining operations, including the Proposed Action, are regulated by the WDEQ-LQD and WDEQ-WQD, which requires the implementation of specific mitigation measures to reduce and limit impacts to surface water resources. As a result, these operations would have no important impacts on surface water flow and quality. Therefore, cumulative impacts to surface water resources would not be important because there are no past, present, or reasonable foreseeable future actions that, when combined with the Proposed Action, would result in impacts beyond those that already exist or have already been identified and discussed earlier in this EA.

4.2.5.2 Groundwater Resources

Alternative I – No Action Alternative

Under the No Action Alternative, there are no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

Surface mining operations at the Jim Bridger Mine likely result in more impacts to groundwater resources than any other human-related activity within the CIAA. Impacts would be similar to those discussed above, include removing groundwater, replacing the existing water-bearing zones, potentially impacting groundwater quality, and altering groundwater recharge rates (BCC 2003).

However, these impacts are not expected to be permanent. As a result of ongoing surface coal mining operations by BCC, portions of the area currently being underground mined and the lease modification area have likely already been impacted to some extent by groundwater drawdown northeast of the Jim Bridger Mine (BCC 2003). The Leucite Hills surface coal mine removes coal from the Almond Formation located geologically below the Fort Union Formation. Within the CIAA, the Fort Union and Almond Formations are hydrologically isolated from each other. Therefore, groundwater drawdown in the Fort Union Formation is not affected by mining and groundwater removal operations conducted in the Almond Formation and would not result in cumulative impacts between the two formations (BCC 2003).

The addition of the Proposed Action would likely result in the limited cumulative groundwater drawdown in the Fort Union Formation to the east and northeast of the TMRT area. WDEQ-LQD requires all coal mining companies to determine the predicted extent of the 5-foot

drawdown contour prior to the approval of the mine and reclamation permit. Therefore, BCC would conduct necessary groundwater studies to determine the predicted 5-foot drawdown levels during the mine permitting phase of the project. Based on information presented in BCC's existing mine and reclamation permit, the 5-foot groundwater level would likely be limited within the CIAA and would have no important impact on regional groundwater resources. All mining operations, including the Proposed Action, would be regulated by the WDEQ-LQD and WDEQ-WQD, which would require the implementation of appropriate mitigation measures to reduce and limit impacts to groundwater resources. Existing appropriated groundwater rights would also be protected.

As a result, BCC has existing permits from regulatory agencies in accordance with applicable federal and state laws. Therefore, cumulative impacts to groundwater resources would not be important because there are no past, present, or reasonable foreseeable future actions that, when combined with the Proposed Action, would result in impacts beyond those that already exist or have already been identified and discussed earlier in this EA.

4.2.5.3 Wetlands/Riparian Resources

Alternative I – No Action Alternative

Under the No Action Alternative, there are no cumulative effects greater than those already authorized in the project area.

Alternative II – Proposed Action

The CIAA for wetland resources are the two fifth-level watersheds that drain the lease modification area – Middle Black Rock Creek and Upper Deadman Wash. Together, they have a combined drainage area of 67,815 acres (refer to Figure 3.2). The CIAA includes approximately 100 acres of potential wetlands that are composed of palustrine temporarily flooded (U.S. Fish and Wildlife Service [USFWS] wetland classification PUSA), lacustrine/limnetic (USFWS wetland classification L1) and lacustrine/littoral (USFWS wetland classification L2). In addition, there is a total of 34 miles of ephemeral streams (USFWS wetland classification R4SB) and adjacent wetlands (USFWS wetland classification PEM, PSS, wetland classification R4SB) and adjacent wetlands (USFWS wetland classification PEM, PSS, and PUS) (USFWS 1997). Approximately 9.6% of the CIAA (6,511 acres) has been disturbed by major industrial facilities, minor industrial facilities, wells and associated facilities, and roads.

Existing surface mining operations at the Jim Bridger Mine have likely resulted in more impacts to wetland or riparian areas than any other current activity within the CIAA. Existing impacts include the temporary removal of wetland and riparian areas. However, these impacts are not expected to be permanent, and wetland and riparian areas would be replaced or reclaimed.

The Proposed Action would result in no additional impacts to wetland resources. Therefore, there would be no cumulative impacts to wetlands because there are no past, present, or reasonable foreseeable future actions that, when combined with the Proposed Action, would result in impacts beyond those that already exist or have already been identified and discussed in TMRT EA.

4.3 Residual Effects

Alternative I – No Action Alternative

If the proposed lease modification is not approved, it is likely that the federal coal reserves within the project area would be bypassed, resulting in a loss of federal and state royalties.

Alternative II – Proposed Action

If the Proposed Action is approved, up to approximately 5.7 million tons of coal would be removed, resulting in approximately 7 feet of subsidence above the mined areas. Additionally, the mine and power plant would contribute approximately one additional year of impacts to air quality and GHG emissions.

4.4 Mitigation Measures and Standard Coal Lease Stipulations

MITIGATION MEASURES

- The potential adverse effects to the two cultural sites would be mitigated through an amendment to the existing Memorandum of Agreement between the BLM, SHPO, OSM, WDEQ, and BCC regarding effects to historic properties for the current underground mine.
- Short-term control of surface runoff, if needed, would be accomplished by implementation of alternate sediment control measures required by the WDEQ-LQD and as described in the mine plan. Long-term control of surface runoff would be accomplished by successful implementation of the reclamation plan in the associated mine plan.

SPECIAL STIPULATIONS

In addition to observing the general obligations and standards of performance set out in the current regulations, the lessee shall comply with and be bound by the following special stipulations.

These stipulations are also imposed upon the lessee's agents and employees. The failure or refusal of any of these persons to comply with these stipulations shall be deemed a failure of the lessee to comply with the terms of the lease. The lessee shall require his agents, contractors and subcontractors involved in activities concerning this lease to include these stipulations in the contracts between and among them. These stipulations may be revised or amended, in writing, by the mutual consent of the lessor and the lessee at any time to adjust to changed conditions or to correct an oversight.

(a) **CULTURAL RESOURCES** –

- (1) Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by the Authorized Officer of the BLM or of the surface managing agency, if different, on portions of the mine plan area and adjacent

areas, or exploration plan area, that may be adversely affected by lease-related activities and which were not previously inventoried at such a level of intensity. The inventory shall be conducted by a qualified professional cultural resource specialist (i.e., archeologist, historian, historical architect, as appropriate), approved by the Authorized Officer of the surface managing agency (BLM, if the surface is privately owned), and a report of the inventory and recommendations for protecting any cultural resources identified shall be submitted to the Regional Director of the Western Region of the Office of Surface Mining (the Western Regional Director), the Authorized Officer of the BLM, if activities are associated with coal exploration outside an approved mining permit area (hereinafter called Authorized Officer), and the Authorized Officer of the surface managing agency, if different. The lessee shall undertake measures, in accordance with instructions from the Western Regional Director, or Authorized Officer, to protect cultural resources on the leased lands. The lessee shall not commence the surface disturbing activities until permission to proceed is given by the Western Regional Director or Authorized Officer.

(2) Any existing Class III inventory report covering the lease area that has not received federal agency review must be reviewed and accepted by the agency, site NRHP eligibility determinations made, and consultation with the State Historic Preservation Officer completed before any surface disturbing activities take place.

(3) The lessee shall protect all cultural resource properties that have been determined eligible or unevaluated to the National Register of Historic Places within the lease area from lease-related activities until the cultural resource mitigation measures or site evaluations can be implemented as part of an approved mining and reclamation or exploration plan unless modified by mutual agreement in consultation with the State Historic Preservation Officer.

(4) The cost of conducting the inventory, preparing reports, and carrying out mitigation measures shall be borne by the lessee.

(5) If cultural resources are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the Western Regional Director or Authorized Officer, or the Authorized Officer of the surface managing agency, if the Western Regional Director is not available. The lessee shall not disturb such resources except as may be subsequently authorized by the Western Regional Director or Authorized Officer. Within two (2) working days of notification, the Western Regional Director or Authorized Officer will evaluate or have evaluated any cultural resources discovered and will determine if any action may be required to protect or preserve such discoveries. The cost of data recovery for cultural resources discovered during lease operations shall be borne by the lessee unless otherwise specified by the Authorized Officer of the BLM or of the surface managing agency, if different.

(6) All cultural resources shall remain under the jurisdiction of the United States until ownership is determined under applicable law.

(b) ***PALEONTOLOGICAL RESOURCES*** – If paleontological resources, either large and conspicuous, and/or of significant scientific value are discovered during mining operations, the find will be reported to the Authorized Officer immediately. Mining operations will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological value. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

(c) ***THREATENED, ENDANGERED, CANDIDATE, OR OTHER SPECIAL STATUS PLANT AND ANIMAL SPECIES*** –

(1) The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.*, or that have other special status. The Authorized Officer may recommend modifications to exploration and development proposals to further conservation and management objectives or to avoid activity that will contribute to a need to list such species or their habitat or to comply with any biological opinion issued by the Fish and Wildlife Service for the proposed action. The Authorized Officer will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act. The Authorized Officer may require modifications to, or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species, or result in the destruction or adverse modification of designated or proposed critical habitat.

(2) The lessee shall comply with instructions from the Authorized Officer of the surface managing agency (BLM, if the surface is private) for ground disturbing activities associated with coal exploration on federal coal leases prior to approval of a mining and reclamation permit or outside an approved mining and reclamation permit area. The lessee shall comply with instructions from the Authorized Officer of the Office of Surface Mining Reclamation and Enforcement, or his designated representative, for all ground-disturbing activities taking place within an approved mining and reclamation permit area or associated with such a permit.

(3) Any potential habitat that has not already been surveyed for Ute ladies'-tresses within the project area shall be identified and surveyed prior to surface mining activities.

(d) **MULTIPLE MINERAL DEVELOPMENT** – Operations will not be approved which, in the opinion of the Authorized Officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.

(e) **OIL AND GAS/COAL RESOURCES** – The BLM realizes that coal mining operations conducted on Federal coal leases issued within producing oil and gas fields may interfere with the economic recovery of oil and gas; just as Federal oil and gas leases issued in a Federal coal lease area may inhibit coal recovery. BLM retains the authority to alter and/or modify the resource recovery and protection plans for coal operations and/or oil and gas operations on those lands covered by Federal mineral leases so as to obtain maximum resource recovery.

(f) **RESOURCE RECOVERY AND PROTECTION** – Notwithstanding the approval of a resource recovery and protection plan (R2P2) by the BLM, the lessor reserves the right to seek damages against the operator/lessee in the event (i) the operator/lessee fails to achieve maximum economic recovery (MER) (as defined at 43 CFR 3480.0-5(21)) of the recoverable coal reserves or (ii) the operator/lessee is determined to have caused a wasting of recoverable coal reserves. Damages shall be measured on the basis of the royalty that would have been payable on the wasted or unrecoverable coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unmineable by the operation, the operator/lessee shall submit appropriate justification to obtain approval by the Authorized Officer to lease such reserves unmined. Upon approval by the Authorized Officer, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/lessee from exercising its right to relinquish all or portion of the lease as authorized by statute and regulation.

In the event the Authorized Officer determines that the R2P2, as approved, will not attain MER as the result of changed conditions, the Authorized Officer will give proper notice to the operator/lessee as required under applicable regulations. The Authorized Office will order a modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such an ordered modification, any reserves left unmined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such unmined recoverable coal reserves shall become due and payable upon determination by the Authorized Officer that the coal reserves have been rendered unmineable or at such time that the operator/lessee had demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the Office of Natural Resources Revenue (formerly Minerals Management

Service) demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

(g) ***PUBLIC LAND SURVEY PROTECTION*** – The lessee will protect all survey monuments, witness corners, reference monuments, and bearing trees against destruction, obliteration, or damage during operations on the lease areas. If any monuments, corners or accessories are destroyed, obliterated, or damaged by this operation, the lessee will hire an appropriate county surveyor or registered land surveyor to reestablish or restore the monuments, corners, or accessories at the same locations, using the surveying procedures in accordance with the “Manual of Surveying Instructions for the Survey of the Public Lands of the United States.” The survey will be recorded in the appropriate county records, with a copy sent to the Authorized Officer.

5.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, or AGENCIES CONSULTED

BLM Wyoming consultation with potentially affected Native American tribes concerning the identification and management of specific TCPs and other sensitive sites is a mandated part of Section 106 and Section 110 of the National Historic Preservation Act (NHPA), intended to determine cultural resource sites that might not be archaeological sites or historical structures. Non-archaeological/non-structural site types, such as springs, rivers, undeveloped trails, migration routes, procurement areas, hunting grounds, and vision quest locales, may also be considered sacred to Native American tribes. The following Native American tribes were consulted:

The Ute Tribe of the Uintah and Ouray Reservation
The Eastern Shoshone Tribe of the Wind River Reservation
Northern Arapaho Tribe of the Wind River Reservation
Shoshone-Bannock Tribes of the Fort Hall Reservation

The BLM consulted with the SHPO and the SHPO concurred with the BLM’s determinations regarding the eligibility of the cultural sites near the project area. In addition to tribal and cultural consultations, the BLM RSFO sent the notice of scoping for the lease modification to a variety of local, state, and federal government agencies including Wyoming’s Game and Fish Department, Department of Agriculture, State Geological Survey, Department of Environmental Quality, and State Planning Office; Sweetwater County Conservation District; Sweetwater County Commission; and US Fish and Wildlife Service. Scoping comments are summarized in Appendix A.

6.0 LIST OF PREPARERS

The Environmental Assessment has been prepared by the BLM RSFO staff and BLM Wyoming staff, in conjunction with the Office of Surface Mining.

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Appendix A

Scoping Comment Summary Bridger Coal Lease Modification WYW154595

Seven comments were received during the public scoping period.

Comment Summary	Response
Wyoming Game and Fish Department: Analyze impacts to sage grouse core area and conduct a Density and Disturbance Calculation Tool (DDCT) habitat impact analysis.	The sage-grouse core area habitat is not anticipated to be impacted because the coal would be mined by underground mining methods. No surface impacts are expected except for potential ground subsidence which should not remove any existing habitat and may minimally enhance vegetative production by increasing moisture/snow capture in depressed areas.
Snake River Alliance: Document should have well developed Purpose and Need section. EA should address greenhouse gas emissions and cumulative impacts of coal-fired power generation. EA should address whether the coal would be used locally or exported; whether coal is needed for regional energy production; the future of coal-fired power generation in the Intermountain West, Pacific Northwest, and across the U.S.; whether the demand for power from the Jim Bridger Coal Mine and Power Plant has diminished; whether expanding the mine to serve the power plant is in the best interest of the public and the environment; and include a comprehensive analysis of the changes that are taking place in the American energy sector.	See sections 1.2, Purpose and Need; 1.3, Relationship to Statutes, Regulations, Plans or Other Environmental Analyses; 2.2, Alternative II – Proposed Action; 3.1 Affected Environment, Air Quality/Global Climate Change; 4.1.1 Environmental Effects, Air Quality/Global Climate Change; 4.2.1, Cumulative Effects, Air Quality/Global Climate Change; and 4.2 Cumulative Effects. The following comments are outside of the scope of this EA: whether coal is needed for regional energy production; the future of coal-fired power generation in the Intermountain West, Pacific Northwest, and across the U.S.; whether the demand for power from the Jim Bridger Coal Mine and Power Plant has diminished; the changes that are taking place in the American energy sector.
Powder River Basin Resource Council, Sierra Club, and WildEarth Guardians: EA should address current and projected reclamation status; air quality impacts from mining; water quantity and quality, including groundwater depletion, changes to surface or groundwater quality, and impacts of coal ash disposal/discharge to water quality; subsidence; threatened and endangered species,	See sections 2.2.3, Proposed Action and Alternatives, Reclamation; 3.1.1, Affected Environment, Air Quality/Global Climate Change; 4.1.1, Affected Environment, Air Quality/Global Climate Change and 4.2.1, Cumulative Effects, Air Quality/Global Climate Change; 3.5 Affected Environment, Water Resources; 4.1.5 Environmental Effects, Water Resources.

Comment Summary	Response
including fish and their habitat; impacts from coal burning; greenhouse gas emissions (quantitative and qualitative analysis) from mining activities; climate change; and impacts from Jim Bridger Power Plant on air and water quality.	As addressed in the EA, there are no anticipated surface impacts with the exception of subsidence caused by underground coal mining; thus, reclamation efforts are not relevant for this EA. Surface waters would not be impacted. Groundwater that is “produced” during underground mining would be pumped to sumps located in the underground mine workings and to the Bridger Power Plant through existing pipelines. Water not used at the plant would be treated at the Bridger waste water treatment facility. There are no threatened or endangered species in the project area. The project would not impact special status species.
Resident of Green River, WY: Supports the proposed action to extend the life of the existing mine. Bridger Coal conducts their business responsibly.	Comment noted.
Green River Chamber of Commerce: Supports the proposed action to extend the life of the existing mine. Mine brings economic benefits to the area. Environmental impacts caused by the proposed action would be an extension of existing, known impacts of the mine.	Comment noted.
Sweetwater County: Supports responsible resource exploration and development. BLM should analyze impacts to county roads; county permits; protection of unique features including Spring Butte, Black Rock and the Point of Rocks-South Pass Stage Route; and analyze, if needed, work camps, water resources, disturbance and reclamation, wildlife, and enforcement of permit and lease stipulations.	See sections 3.2, Affected Environment, Cultural Resources; 4.1.2, Environmental Effects, Cultural Resources; 3.5 Affected Environment, Water Resources; 4.1.5 Environmental Effects, Water Resources. The project would not impact county roads. No additional county permits would be needed. No impacts to cultural features are anticipated. As addressed above there are no anticipated surface impacts with the exception of subsidence caused by underground coal mining. Surface waters would not be impacted, and ground water which is present in underground mine workings would be pumped to sumps located in the underground mine workings and to the Bridger Power Plant through existing pipelines.

Comment Summary	Response
<p>Rock Springs Chamber of Commerce: Supports the proposed action to extend the life of the existing mine. Mine brings economic benefits to the area. Environmental impacts caused by the proposed action would be an extension of existing, known impacts of the mine.</p>	<p>Comment noted.</p>