

18.1 Introduction

The Council on Environmental Quality (CEQ) regulations that implement the National Environmental Policy Act (NEPA) define a cumulative impact as “the impact on the environment which results from the incremental consequences of an action when added to past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions” (40 Code of Federal Regulations [C.F.R.] § 1508.7). This chapter describes the cumulative impacts that would result from the addition of impacts from the proposed rail line to impacts of other past, present, and reasonably foreseeable future projects and actions. The sections that follow describe the cumulative impacts study area, the methods used to analyze cumulative impacts, and the affected environment. The contribution of impacts from construction and operation of the proposed rail line to cumulative impacts is summarized for each resource area examined in this Draft EIS. Appendix U, *Cumulative Impacts Analysis*, provides further data on methods and the impact assessment for each of the resources, including a quantitative assessment of cumulative impacts, where possible.

In summary, cumulative impacts would result from the impacts from construction and operation of the proposed rail line in addition to impacts from other relevant projects and actions in the area of the proposed rail line (defined below as the *cumulative impacts study area*). These cumulative impacts would affect vegetation, wildlife, fish, special-status species, surface water, groundwater, floodplains, wetlands, visual resources, cultural resources, land use, recreation, energy, and socioeconomics. Construction and operation of the proposed rail line would result in negligible contributions to cumulative impacts on grade-crossing safety, grade-crossing delay, greenhouse gases and climate change, coal dust, air quality, geology and soils, and paleontological resources. Construction and operation of the proposed rail line would not contribute to cumulative impacts on rail operation and safety, navigation, noise and vibration, Section 4(f) and 6(f) resources, hazardous waste sites, and environmental justice. Therefore, additional cumulative impacts analysis of those resources is not warranted.

In most cases where cumulative impacts would occur, required reclamation of mining and well development and required mitigation would reduce such impacts.

18.2 Cumulative Impacts Study Area

The cumulative impacts study area is defined for each resource that would be affected by construction and operation of the proposed rail line (Appendix U, Section U.3.2 *Cumulative*

Impacts Study Area). Some cumulative impacts study areas are identical to the resource study areas described in Chapters 3 through 16. Other resources have a larger cumulative impacts study area. For example, while the wetland study area is limited to the right-of-way plus a buffer area, the wetland cumulative impacts study area encompasses any watersheds that drain into the wetlands along the build alternatives—a much larger area. The cumulative impacts study area for each resource—and how it differs from the study area defined for that resource in Chapters 3 through 16—is described for each resource in Appendix U, *Cumulative Impacts Analysis*. For all resource areas except greenhouse gases and climate and socioeconomics, the outer limits of the cumulative impacts study area are defined as the boundaries of Rosebud, Custer, Powder River, and Big Horn Counties. The cumulative impacts study area includes the affected areas identified for all coal mines (existing and potentially induced), as described in Section 18.4.1, *Relevant Projects and Actions*.

OEA determined that the appropriate period for this cumulative impacts analysis is the same as the 20-year analysis period for all resources, from 2018 to 2037. The construction period would vary by build alternative and by implementation of either an 8- or 12-month construction schedule.

18.3 Analysis Methods

To help federal agencies assess cumulative impacts under NEPA, CEQ developed a handbook entitled *Considering Cumulative Effects under the National Environmental Policy Act* (Council on Environmental Quality 1997). OEA followed these guidelines in its evaluation of whether cumulative impacts could result from adding impacts of constructing and operating the proposed rail line to impacts of past, present, and reasonably foreseeable future projects and actions in the area of the proposed rail line. Based on the CEQ guidance, OEA used the following guidelines to evaluate the cumulative impacts of construction and operation of the build alternatives.

- Focus on the impacts and resources in the context of the proposed project.
- Rely on information from other agencies and organizations about reasonably foreseeable projects and actions that are beyond the Board's scope of responsibility.
- Relate to the geographic scope of the proposed project.
- Relate to the temporal period of the proposed project.
- Reach conclusions based on the best available data at the time of the analysis.

Appendix U, Section U.3.1, *Methods*, provides a discussion of the analysis methods.

18.4 Affected Environment

Although the exact location of the proposed rail line would depend on which build alternative the Board licenses, any northern alternative¹ would be located between Miles City and Colstrip, Montana and two terminus points south of Ashland, Montana; either of the southern alternatives would be located between those terminus points and Decker, Montana. One terminus would be near the site of the previously planned Montco Mine and the other would be at the proposed Otter Creek Mine in the Otter Creek area east of Ashland. Figure 18-1 shows the build alternatives along with the other relevant projects included in this cumulative impacts analysis. The geographic region is primarily rural and sparsely populated. Land uses include grazing land, irrigated land, nonirrigated hay land, forestland, and farmland. The elevations range from 2,362 to 4,134 feet and increase from north to south. Five major habitats are represented: riparian, grassland, shrubland, woodland, and agricultural fields. The region provides habitat for wildlife species such as elk, mule deer, antelope, white-tailed deer, and mountain lion. Cultural resources include homestead cabins and trails. Several designated recreation areas are located in this region.

18.4.1 Relevant Projects and Actions

OEA researched past, present, and reasonably foreseeable future projects and actions that could result in impacts that would coincide in time and space with impacts from the proposed rail line. OEA initially identified and screened a number of projects for possible inclusion in the cumulative impacts analysis. Of these, OEA determined that the relevant projects summarized below could contribute to cumulative impacts. These relevant projects include three existing coal mines and a power plant, three proposed or potentially induced mines, four land management projects, energy development on Bureau of Land Management (BLM) and private lands, and two construction projects, for a total of 15 projects. Three additional construction projects were analyzed only for certain socioeconomic impacts: the Keystone XL Pipeline, in Fallon County, Montana, and Youngs Creek and Brook Mines in Sheridan County, Wyoming. See Appendix U, Section U.3.3, *Projects Analyzed*, for a detailed discussion of each of these projects as well as projects considered but ultimately excluded from the cumulative impacts analysis.

¹ The northern alternatives are the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives. The southern alternatives are the Decker Alternatives.

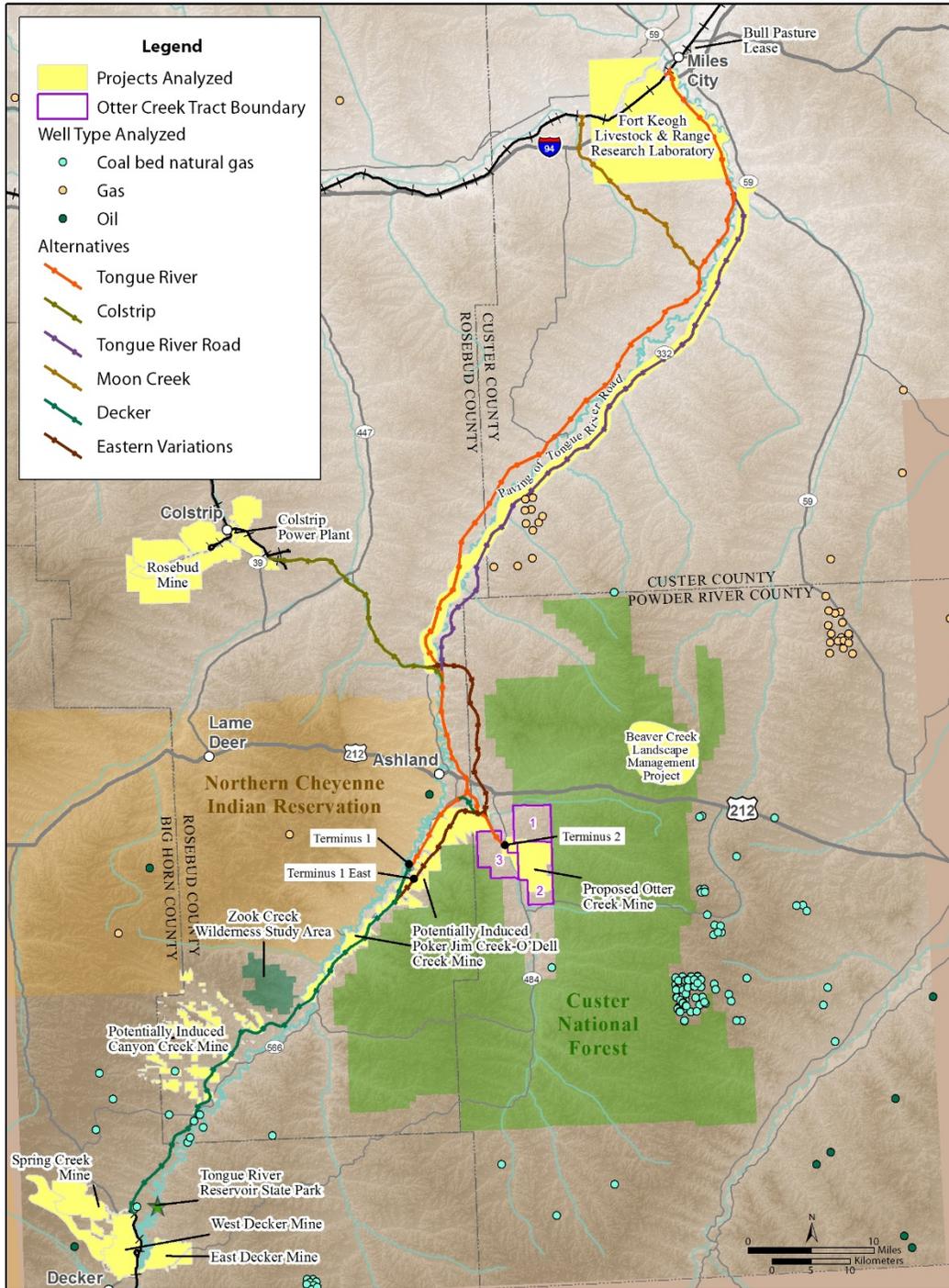


Figure 18-1. Projects Analyzed

Existing Coal Mines

Rosebud Mine and Colstrip Power Plant

The Rosebud Mine is located approximately 2 miles from Colstrip in Rosebud County, and would be less than 2 miles from the Colstrip Alternatives. The mine property is approximately 25,000 acres. Three active pits produce approximately 10 to 13 million tons of coal per year (Westmoreland Coal Company 2014). Almost all of the coal is used to fuel the adjacent four-unit, 2,100- megawatt Colstrip Power Plant.

Spring Creek Mine

The Spring Creek Mine is located approximately 7 miles north of Decker in Big Horn County, and would be approximately 4 miles from the Decker Alternatives. The mine shipped 17.2 million tons of coal in 2012 to domestic and international markets through the Westshore Terminal in British Columbia, Canada (Cloud Peak Energy 2014).

Decker Mine

The Decker Mine, which consists of east and west coal tracts, is located 3 miles north of Decker in Big Horn County, and would be less than 1 mile from the Decker Alternatives. The mine produces approximately 3 million tons of coal per year with a remaining reserve of 138 million metric tons. It is served by two rail loops operated by the BNSF Railway Company (BNSF) (Ambre Energy 2012).

Proposed and Potentially Induced Coal Mines

Southeastern Montana contains large quantities of coal. If a rail line were approved and built, it would serve the proposed Otter Creek Mine and could induce the development of other coal resources in the area. In Appendix C, *Coal Production and Markets*, OEA analyzed the coal production that could be induced by construction and operation of the proposed rail line. The availability of the rail service coupled with the large quantities of competitively priced coal reserves makes it reasonably foreseeable that these reserves would be mined over the analysis period (2018 to 2037). OEA's analysis considered the proposed Otter Creek Mine and two potentially induced mines: one at the Poker Jim Creek–O'Dell Creek coal deposit and one at the Canyon Creek coal deposit.

OEA examined other coal deposits in the area; however, they were eliminated from further study because development of the coal deposits is unlikely due to factors such as higher overburden ratio, locations more than 15 miles from any build alternative, low coal heat content, and insufficient recoverable reserves.

Proposed Otter Creek Mine

On July 26, 2012, Otter Creek Coal, LLC submitted a permit application to the Montana Department of Environmental Quality to construct and operate a surface coal mine near

Ashland, Montana. The proposed coal mine would consist of three tracts totaling 25,791 acres. OEA's cumulative impacts analysis focuses on Tract 2, which totals 7,639 acres and is the subject of a Mine Permit Application under review with the Montana Department of Environmental Quality. At its peak, the mine is estimated to produce 20 million tons of coal per year (Otter Creek Coal, LLC 2012). This production level would require an average of 7.4 trains per day to transport the coal (Appendix C, *Coal Production and Markets*). The construction schedule for the proposed Otter Creek Mine would coincide with the construction schedule for the proposed rail line.

Potentially Induced Poker Jim Creek–O'Dell Creek Mine

The Poker Jim Creek–O'Dell Creek deposit is composed of two coal beds, Knobloch Plate 11A and Knobloch Plate 11B, which contain an estimated 938 million tons of relatively high-quality coal. The coal deposit covers an area of approximately 15,077 acres (Matson and Blumer 1973). OEA's cumulative impacts analysis considers an area of 17,951 acres, an area slightly larger than the deposit area to account for additional acreage that would be needed for mine support operations. For the purposes of this cumulative impacts analysis, OEA estimated that construction of the potentially induced Poker Jim Creek–O'Dell Creek Mine would begin in 2021, last for 2.5 years, and would not overlap with construction of any build alternative. If developed, the mine could begin operation in 2023. The mine could produce from 12 to 16 million tons of coal per year, requiring an average of 4.4 to 5.8 trains per day to transport the coal (Appendix C, *Coal Production and Markets*).

Potentially Induced Canyon Creek Mine

The Canyon Creek deposit is composed of two coal beds, the Brewster-Arnold and the Wall. The Brewster-Arnold coal bed has relatively low-quality coal and minimal reserves, while the Wall coal bed contains relatively high-quality coal. The total Wall coal bed deposit covers 23,859 acres. OEA's cumulative impacts analysis focuses on 11,672 acres of the Wall coal bed, an area that includes acreage having federal or state surface and mineral rights and excludes the Zook Creek Wilderness Study Area and all but approximately 6,000 acres of privately owned land. For the purposes of this cumulative impacts analysis, OEA estimated that construction of the potentially induced Canyon Creek Mine would begin in 2025, last 2.5 years, and would not be affected by the construction schedule of any build alternative. If developed, the mine would begin operation in 2028. The mine would produce 22 million tons of coal per year, requiring an average of 8.0 trains per day to transport the coal (Appendix C, *Coal Production and Markets*).

Land Management

Fort Keogh Livestock and Range Research Laboratory

The U.S. Department of Agriculture, Fort Keogh Livestock and Range Research Laboratory (Fort Keogh) is located outside of Miles City. The Tongue River Alternatives or Tongue

River Road Alternatives would cross or be less than 1 mile from Fort Keogh. The property consists of about 55,000 acres, of which approximately 50,000 acres are native rangeland, 2,500 acres are dryland planted pasture, 1,000 acres are irrigated pasture, and 700 acres are irrigated cropland. The remaining acreage is made up of corrals, roads, and the headquarters building. The irrigated farming operation produces alfalfa hay, corn silage, barley grain, sorghum sudan hay, and an assortment of other barley straw and grass hays for livestock feed. Land management and agricultural operations on Fort Keogh could contribute to cumulative impacts.

Tongue River Reservoir State Park

Montana State Parks and Montana Fish, Wildlife & Parks propose to renovate several campgrounds in the Tongue River Reservoir State Park, including Pee Wee Point North, Pee Wee Point South, and Sandpoint campgrounds. Tongue River Reservoir State Park is located on the Tongue River Reservoir, 6 miles north of Decker, Montana and 1 mile east of Highway 314. The Decker Alternatives would be less than 2 miles away. Renovations would include water, sewer, and electricity hook ups and construction of storage, docking, and parking areas (Montana State Parks and Montana Fish, Wildlife & Parks 2012). These renovations could contribute to cumulative impacts.

BLM Miles City Draft Resource Management Plan and Environmental Impact Statement

BLM's Miles City Field Office published the *Draft Resource Management Plan and Environmental Impact Statement* (Draft RMP/EIS) (Bureau of Land Management 2013), which analyzes five alternatives for managing BLM-administered lands and resources in eastern Montana. The Final RMP and Record of Decision are expected to be released in 2015 (Bureau of Land Management 2013). BLM's Preferred Alternative (Alternative E) would include land to be leased for oil and natural gas development (5.4 million acres), special-status species high-priority habitats to be managed for sage-grouse in North Rosebud (173,00 acres) and Decker (8,300 acres), livestock grazing to be expanded to 2.7 million acres, surface-disturbing activities to be prohibited in riparian and wetland areas, special recreation management areas to be designated in Powder River Depot (162 acres) and Pumpkin Creek Ranch (19,435 acres), and new paleontological areas of critical environmental concern to be designated (Bureau of Land Management 2013). Land management actions under the BLM Draft RMP/EIS could contribute to cumulative impacts.

Beaver Creek Landscape Management Project

The *Beaver Creek Landscape Management Project* (Beaver Creek LMP) (U.S. Forest Service 2011) includes over 14,000 acres located in the Custer National Forest in the Ashland Ranger District of the U.S. Forest Service, approximately 17 miles east of Ashland, Montana. The Beaver Creek LMP would be implemented approximately 15 miles from any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or

Moon Creek Alternatives. The Beaver Creek LMP is intended to reduce fuel loading (surface, ladder, and canopy fuels) on the landscape in order to promote fires of less severity and intensity and, ultimately, a healthy ponderosa pine ecosystem that is more resilient and sustainable (U.S. Forest Service 2011). Land management actions under the Beaver Creek LMP could contribute to cumulative impacts.

Energy Development

The BLM Draft RMP/EIS discussed above identified the reasonably foreseeable fluid minerals (petroleum, natural gas, coal bed natural gas [CBNG]) development in the RMP planning area. BLM estimated that a maximum of 7,600 wells, including CBNG wells, would be drilled in the planning area between 2011 and 2030, of which 1,200 would be CBNG wells (Bureau of Land Management 2013). However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

In addition to well development on BLM-administered lands, oil and gas exploration and development continues throughout southeastern Montana on federal, state, tribal, and private lands. Gas well development in southeastern Montana includes CBNG wells. Energy development could contribute to cumulative impacts.

Construction Projects

Tongue River Road Paving

The Montana Department of Transportation's *Tongue River Road Corridor Planning Study* (2012) identified paving the gravel sections of Tongue River Road from reference post 17.7 to reference post 50.4 (less than 1 mile from any of the Tongue River Alternatives and Tongue River Road Alternatives) as a potential large-scale improvement project. Paving Tongue River Road in part or whole could result in an increase in traffic. Funding for this improvement has not yet been identified and other corridor improvement options have not been finalized. Both construction and increased traffic could contribute to cumulative impacts.

Bull Pasture Subdivision Leasing

Montana Department of Natural Resources and Conservation issued a request for proposal in October 2013, for the commercial lease of the bull pasture subdivision, a 38.55-acre parcel of school trust land located in Custer County, which would be less than 3 miles from the Tongue River Alternatives or Tongue River Road Alternatives. No proposals were received by the submission deadline of December 2, 2013 (Montana Department of Natural Resources and Conservation 2013). The Montana Department of Natural Resources and Conservation anticipates issuing another request for proposal in 2015 (Landers pers. comm.). Future commercial development or commercial activities on the bull pasture subdivision, depending on the lease, could contribute to cumulative impacts.

Keystone XL Pipeline

TransCanada Company is proposing a pipeline that would deliver oil from Canada to points south. The proposed pipeline, if constructed, would pass through Fallon County, Montana. This county is included in the socioeconomics study area. Therefore, OEA analyzed impacts from this project only in conjunction with the socioeconomics cumulative impacts analysis.

Youngs Creek Mine and Brook Mine

Youngs Creek Mine and Brook Mine would be located in Sheridan County, Wyoming. Cloud Peak Energy, Inc. has completed a permit application for the Youngs Creek Mine, but has not yet determined a construction start date. The Wyoming Department of Environmental Quality has accepted Ramaco LLC's permit application for Brook Mine and is currently completing a technical review. Brook Mine construction is anticipated to start in 2016. Ramaco has stated that the coal would be destined for domestic utilities and would be competitive in the Asian export market. Both mines have high quality coal with an average heat content of 9,100 British thermal units per pound and low sulfur content (between 0.32 and 0.68 percent). Sheridan County, Wyoming is included in the socioeconomics study area.

18.5 Cumulative Impacts by Resource

Each of the resources addressed in Chapters 3 through 16 of this Draft EIS is included in this cumulative impact analysis. For each resource, if the relevant project would not contribute to impacts in the cumulative impacts study area, no additional cumulative impact analysis is warranted and the project is not discussed further. If the relevant project would contribute to impacts in the cumulative impact study area and those impacts would combine with the impacts of the proposed rail line to result in a cumulative impact, those impacts are summarized in bullet format for each relevant project.

The impacts of the proposed rail line are described in the respective chapters or sections for each resource. A detailed discussion of the cumulative analysis, including quantification of impacts where possible, is provided in each resource section of Appendix U, *Cumulative Impacts Analysis*.

18.5.1 Transportation

18.5.1.1 Rail Operations and Rail Safety

None of the relevant projects and actions would result in increased rail traffic in the cumulative impacts study area. Therefore, no additional cumulative impacts analysis is warranted (Appendix U, Section U.4.1.1, *Rail Operations and Rail Safety*), and no cumulative impacts on rail operation and safety would result.

18.5.1.2 Grade-Crossing Delay

The proposed rail line would create grade-crossing delay, which could combine with impacts from the other relevant projects, resulting in cumulative impacts on grade-crossing delay in the cumulative impacts study area (Appendix U, Section U.4.1.2, *Grade-Crossing Delay*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on grade-crossing delays at new grade crossings as those crossings are constructed. The delay would vary by build alternative and coal production scenario.²
- **Proposed and potentially induced coal mines.** Any build alternative would cause grade-crossing delay impacts. No cumulative grade-crossing delay impacts would result from construction of the proposed Otter Creek Mine primarily because Otter Creek Mine operations would not begin prior to construction of new grade crossings. Construction of the potentially induced mines would increase vehicular traffic on area roads and would contribute to delays at new grade crossings. These grade-crossing delay impacts would not be permanent. The average total delay for all traffic during mine construction would be less than 2 seconds per vehicle and a maximum of 25 vehicles would be delayed per day at a single crossing. Vehicles stopped by a train would typically be delayed for a few minutes.

Operation of the proposed and potentially induced mines would slightly increase traffic on area roads from workers commuting to and from the mines. The average total delay for all traffic, including traffic associated with mine operation, would be less than 4 seconds per vehicle and a maximum of 86 vehicles would be delayed per day at a single crossing. Vehicles stopped by a train would typically be delayed for a few minutes.

- **Energy development.** The BLM Draft RMP/EIS would promote oil and natural gas projects on 5.4 million acres of leased land in Rosebud, Custer, Powder River, and Big Horn Counties (the four-county area). BLM estimated that a maximum of 7,600 wells, including CBNG wells, are projected to be drilled in the RMP planning area in the analysis period of 2011 through 2030.³ In order to estimate the number of potential wells in the project area, OEA used a geographic analysis of the townships in the Tongue River area and the oil and gas well development potential of each township. The OEA analysis resulted in a lower number of projected wells than the number of wells projected by BLM for the RMP planning area because most of the Tongue River area is of low development potential or medium development potential and none of the Tongue River area is of high development potential.

² Three coal production scenarios (low, medium, high) depend on which build alternative is licensed and constructed and which proposed and potentially induced mines are producing coal. Higher coal production scenarios are associated with more rail traffic. See Appendix C, *Coal Production and Markets* for a discussion of these scenarios.

³ BLM 2013 Estimated Future Oil And Gas Production, Page Min-116.

OEA estimated that 1,158 CBNG wells would be developed between 2011 and 2030, and considers this estimate much higher than the number of wells that will be permitted and completed. However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*). In addition to well development on BLM-administered lands, oil and gas exploration and development continues throughout southeastern Montana on federal, state, tribal, and private lands.

The preferred alternative in the BLM Draft RMP/EIS would increase the amount of land to be leased for oil and gas development. OEA calculated traffic increases associated with construction of the wells. BLM stated that each drill rig would require three workers and OEA assumed that each of those workers would add one vehicle to daily traffic on local roads. The road length that would be affected by CBNG construction would range from 0.237 to 0.365 mile, with an average of 0.301 mile. The total road length that would be affected would range from 90.3 to 2,107.7 miles across all four counties (Table 18-1). The total length of affected roads would be distributed throughout the counties.

Table 18-1. Road Disturbance for Coal Bed Natural Gas Well Development by County

County	Average Length of Road (miles per well)	Total Wells to be Drilled	Total Length of Road Affected (miles)
Custer	0.301	300	90.3
Rosebud	0.301	2,800	842.8
Powder River	0.301	6,700	2,016.7
Big Horn	0.301	7,000	2,107.0

Energy development on nonfederal lands would cause an increase in traffic along Moon Creek Road, Foster Creek Road, Tongue River Road, Liscom Creek Road, Beaver Creek Road, Snider Creek Road, Tongue River Road East, Four Mile Creek Road, and Highway 314 during construction and maintenance.

Although traffic would increase on local roads, the workforce for well construction and maintenance is expected to be small. Impacts on traffic and grade-crossing delay would occur during maintenance and would not be permanent. These increases would be reduced by measures to reduce vehicle traffic by consolidating well facilities (such as pads and storage vessels) whenever feasible.

Any build alternative would contribute to cumulative grade-crossing delay impacts by increasing traffic on area roads during construction and maintenance of oil and gas wells, whether on federal or nonfederal lands in the cumulative impacts study area. Increased traffic on area roads resulting from construction and operation workers would cause a slight delay at new and existing grade crossings.

- **Construction projects.** The 32.7-mile paving project proposed for Tongue River Road would improve roadway conditions, potentially leading to higher annual average daily traffic (AADT) levels and subsequent increase in vehicle delay at grade crossings along Tongue River Road. Three to five new at-grade crossings along Tongue River Road would be affected. Montana Department of Transportation estimates that future AADT on the Tongue River Road would be between 110 vehicles per day and 2,056 vehicles per day from development of area mines. Montana Department of Transportation states that current travelers may avoid Tongue River Road because it has a gravel surface. With improvements, these travelers may alter their routes in the Ashland and Forsyth areas. An increase of 2,056 vehicles per day on Tongue River Road would result in an increase in average delay per vehicle of less than 1 second. This would be an increase from the total average delay of less than 4 seconds and an average of 95 vehicles delayed per day across all new at-grade crossings along Tongue River Road.

Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative grade-crossing delay impacts related to Tongue River Road paving by causing a small increase in traffic on Tongue River Road. This would result in a slight delay at three to five new at-grade crossings.

In summary, construction and operation of any build alternative would result in cumulative impacts on grade-crossing delay when combined with the proposed and potentially induced coal mines and energy development. Some build alternatives would result in cumulative impacts on grade-crossing delay when combined with existing coal mines and the Tongue River Road paving project. These projects would have to comply with Montana Department of Environmental Quality (Montana DEQ) and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor adverse cumulative impacts on grade-crossing delay.

18.5.1.3 Grade-Crossing Safety

The proposed rail line could affect grade-crossing safety and could combine with impacts from the other relevant projects to result in cumulative impacts on grade-crossing safety in the cumulative impacts study area (Appendix U, Section U.4.1.3, *Grade-Crossing Safety*). The contribution of impacts from the proposed rail line to cumulative grade-crossing safety impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Ongoing activities at existing coal mines, including in the reasonably foreseeable development (RFD) areas, and the Colstrip Power Plant would have little effect on predicted accidents at new and existing at-grade crossings in the study area except at the crossing of Highway 314. This grade crossing has a higher predicted accident frequency of 0.08891 accident per year and a

predicted interval between accidents of 11 years under the high coal production scenario (Appendix C, *Coal Production and Markets*). Any of the Colstrip Alternatives or Decker Alternatives would contribute to traffic because the existing coal mines and Colstrip Power Plant are already operating in the cumulative impacts study area and the associated vehicle traffic is included in the AADT levels used in the analysis of vehicle safety at new or existing grade crossings.

- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative grade-crossing safety impacts by increasing traffic on area roads. Construction of the proposed Otter Creek Mine would occur before or would coincide with construction of new grade crossings. Construction of the potentially induced mines would temporarily increase vehicular traffic on area roads and could affect safety at new grade crossings. The resulting cumulative grade-crossing safety impact for all vehicle traffic would be an average predicted accident frequency of 0.02865 accidents per year with an accident interval of 1 accident every 35 years.

Operation of the proposed and potentially induced mines would increase traffic on area roads from workers commuting to and from the mines. The actual traffic increases would be small due to differences in employee shift hours, construction time period, commuting distance, and routes used.⁴ The cumulative average predicted accident frequency would be 0.03931 accident per year with an accident interval of one accident every 25 years.

- **Energy development.** The preferred alternative in the BLM Draft RMP/EIS would increase the amount of land to be leased for oil and gas development, which would increase the traffic on local roads. OEA calculated traffic increases associated with construction of the wells. OEA assumed that each drill rig would require three workers and each worker would add one vehicle to daily traffic on local roads. The road length per well that would be affected by CBNG construction would range from 0.237 to 0.365 mile, with an average of 0.301 mile per well. The total road length that would be affected would range from 90.3 to 2,107.7 miles across all four counties (Table 18-1). The total length of affected roads would be distributed throughout the counties. Therefore, any impact on traffic or grade-crossing safety would occur only during construction of the wells and periodically during maintenance. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

Energy development on nonfederal lands would cause an increase in traffic levels along Moon Creek Road, Foster Creek Road, Tongue River Road, Liscom Creek Road, Beaver Creek Road, Snider Creek Road, East Tongue River Road, Four Mile Creek Road, and Highway 314 during construction and maintenance.

Although traffic would increase on local roads, the workforce for well construction and maintenance is expected to be small. Impacts on traffic and grade-crossing safety would

⁴ The estimates are conservative because they are based on construction jobs outlined in Section 18.5.13, *Socioeconomics*, which does not directly correspond to mine construction employees.

not be permanent. BLM would introduce signaling and speed bumps where appropriate to reduce traffic speed and reduced accidents (Bureau of Land Management 2013).

Any build alternative would contribute to cumulative grade-crossing safety impacts by increasing traffic on area roads during construction and maintenance of oil and gas wells, whether on federal or nonfederal lands in the cumulative impact area. Increased traffic on area roads would result from construction and operation workers.

- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives could contribute to cumulative grade-crossing safety impacts related to Tongue River Road paving. Improved roads could increase traffic and speeding, which could increase the accident frequency rate and reduce the interval between accidents. The increase in the predicted accident frequency rate for the high production scenario could result in one accident during the 20-year analysis period (2018 to 2037) based on the predicted interval between accidents at crossings along Tongue River Road for the northern alternatives.

In summary, construction and operation of any build alternative would result in cumulative impacts on grade-crossing safety when combined with the proposed and potentially induced coal mines and energy development. Some build alternatives would result in cumulative impacts on grade-crossing safety when combined with the existing coal mines, Colstrip Power Plant, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in minor adverse cumulative impacts on grade-crossing safety.

18.5.1.4 Navigation

None of the relevant projects and actions would include placement of a structure or work in, over, below, or above navigable waterways. Therefore, no additional analysis of cumulative impacts on navigation is warranted (Appendix U, Section U.4.2.4, *Navigation*), and no cumulative impacts on navigation would result.

18.5.2 Air Quality

The proposed rail line would affect air quality and could combine with impacts from the other relevant projects to result in cumulative impacts on air quality in the cumulative impacts study area (Appendix U, Section U.4.2, *Air Quality*). The contribution of impacts from the proposed rail line to cumulative air quality impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Table 18-2 summarizes permitted criteria air pollutant emissions for operation of the existing mines and the Colstrip Power Plant. Coal mines and power plants are subject to Montana DEQ air quality permitting requirements (17

Administrative Rules of Montana [ARM] 8.7). Depending on the type of equipment or process, a permit may require emission controls or best management practices to minimize potential air quality impacts.

Table 18-2. Existing Coal Mine and Power Plant Permitted Criteria Air Pollutant Emissions

Existing Mine Area	Criteria Air Pollutant Emissions (tons per year)				
	Non-Fugitive Emissions Total				
	CO	NO _x	SO ₂	VOC	PM
Colstrip Power Plant	232	1,435	1,840	16	73
Rosebud Mine	547	377	41	29	1,547
Spring Creek	NR	603	NR	NR	1,048
Decker	1,151	701	77	56	1,732

Notes:
CO = carbon monoxide; NO_x = nitrogen oxides; PM = particulate matter; SO₂ = sulfur dioxide; VOC = volatile organic compound; PM = particulate matter; NR = not reported in permit
Sources: Montana Department of Environmental Quality 2001a, 2001b, and Arch Coal 2012: MAQP# 1120-11, p13, 2013

Any build alternative would contribute to cumulative air quality impacts by contributing criteria air pollutant and hazardous air pollutant emissions to emissions from the existing mines and power plant. Cumulative air quality impacts would include impacts on air quality-related values (AQRVs), which are resources that are affected by air pollution, such as plants and wildlife.

- **Proposed and potentially induced coal mines.** Fugitive particulate matter emissions estimated from construction of the proposed and potentially induced mines are summarized in Table 18-3.

Table 18-3. Fugitive PM Emissions from Construction of Proposed and Potentially Induced Mines

Proposed / Potentially Induced Mine	General Construction Fugitive Emissions			
	Total Mine Area (acres)	Construction Activity Duration (months)	Fugitive PM10 Emissions (tons)	Fugitive PM2.5 Emissions (tons)
Otter Creek	18,181	29	120,213	18,032
Poker Jim Creek–O’Dell Creek	10,171	29	67,251	10,088
Canyon Creek	24,649	29	162,979	24,447

Notes:
PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less

The proposed and potentially induced mines would operate at different levels of production based on a specific coal production scenario (high, medium, low). Each coal production scenario would induce a unique group of mines and builds alternatives associated with that scenario (Appendix C, *Coal Production and Markets*). OEA estimated the criteria pollutant emissions from fuel consumption for the operation of the proposed and potentially induced mines for the low, medium, and high production

scenarios. Table 18-4 presents the estimated criteria pollutant emissions and Table 18-5 presents the estimated hazardous air pollutant emissions for the high production scenario, southern alternatives, which is the scenario that would have the highest emissions for the high production scenario. Tables in Appendix U, Section U.4.2.2, *Proposed and Potentially Induced Mine Operations*, provide the emissions for the low and medium production scenarios as well.

Table 18-4. Criteria Air Pollutant Emissions from Fuel Consumption for Proposed and Potentially Induced Mine Operations – Southern Alternatives, High Production Scenario

Proposed / Potentially Induced Mine	Annual Coal Production Rate (million tons/year)	Fuel Usage (million gallons)	Criteria Air Pollutant Emissions (million tons)						
			CO	NO _x	Pb	PM10	PM2.5	SO ₂	VOC
Otter Creek Mine									
Year 1	20.4	5.9	7.21E-04	2.02E-03	8.74E-07	8.53E-05	8.27E-05	2.63E-06	1.59E-04
Year 2	27.2	7.8	9.62E-04	2.70E-03	1.17E-06	1.14E-04	1.10E-04	3.51E-06	2.12E-04
Year 3+	34.0	9.8	1.20E-03	3.37E-03	1.46E-06	1.42E-04	1.38E-04	4.39E-06	2.65E-04
Poker Jim Creek-O'Dell Creek Mine									
Year 1	9.6	2.8	3.39E-04	9.51E-04	4.11E-07	4.01E-05	3.89E-05	1.24E-06	7.48E-05
Year 2	12.8	3.7	4.53E-04	1.27E-03	5.49E-07	5.35E-05	5.19E-05	1.65E-06	9.97E-05
Year 3+	16.0	4.6	5.66E-04	1.59E-03	6.86E-07	6.69E-05	6.49E-05	2.07E-06	1.25E-04
Canyon Creek Mine									
Year 1	13.2	3.8	4.67E-04	1.31E-03	5.66E-07	5.52E-05	5.35E-05	1.70E-06	1.03E-04
Year 2	17.6	5.1	6.22E-04	1.74E-03	7.54E-07	7.36E-05	7.14E-05	2.27E-06	1.37E-04
Year 3+	22.0	6.3	7.78E-04	2.18E-03	9.43E-07	9.20E-05	8.92E-05	2.84E-06	1.71E-04

Notes:

Fuel usage is a mix of diesel fuel and gasoline

CO = carbon monoxide; NO_x = nitrogen oxides; Pb = lead; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

Table 18-5. Hazardous Air Pollutant Emissions from Fuel Consumption for Proposed and Potentially Induced Mine Operations – Southern Alternatives, High Production Scenario

Proposed / Potentially Induced Mine	Hazardous Air Pollutant Emissions (tons)				
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Ethylbenzene
Otter Creek Mine					
Year 1	3.83E-02	7.29E-03	4.41E-03	5.24E-03	3.18E-01
Year 2	5.11E-02	9.72E-03	5.88E-03	6.99E-03	4.24E-01
Year 3+	6.38E-02	1.22E-02	7.35E-03	8.74E-03	5.30E-01
Poker Jim Creek–O’Dell Creek Mine					
Year 1	1.80E-02	3.43E-03	2.07E-03	2.47E-03	1.50E-01
Year 2	2.40E-02	4.57E-03	2.77E-03	3.29E-03	1.99E-01
Year 3+	3.00E-02	5.72E-03	3.46E-03	4.11E-03	2.49E-01
Canyon Creek Mine					
Year 1	2.48E-02	4.72E-03	2.85E-03	3.39E-03	2.06E-01
Year 2	3.30E-02	6.29E-03	3.80E-03	4.52E-03	2.74E-01
Year 3+	4.13E-02	7.86E-03	4.75E-03	5.66E-03	3.43E-01
	Formaldehyde	n-Hexane	Toluene	Xylene	
Otter Creek Mine					
Year 1	8.06E-02	7.16E-03	0.5086	0.7630	
Year 2	1.07E-01	9.55E-03	0.6782	1.0173	
Year 3+	1.34E-01	1.19E-02	0.8477	1.2716	
Poker Jim Creek–O’Dell Creek Mine					
Year 1	3.79E-02	3.37E-03	0.2394	0.3590	
Year 2	5.06E-02	4.49E-03	0.3191	0.4787	
Year 3+	6.32E-02	5.62E-03	0.3989	0.5984	
Canyon Creek Mine					
Year 1	5.21E-02	4.63E-03	0.3291	0.4937	
Year 2	6.95E-02	6.18E-03	0.4388	0.6582	
Year 3+	8.69E-02	7.72E-03	0.5485	0.8228	

Notes:

Fuel usage is a mix of diesel fuel and gasoline

OEA estimated fugitive particulate matter emissions based on particulate matter emission factors and the coal production rate for each proposed and potentially induced mine. Table 18-6 presents the estimated fugitive particulate matter emissions for the high production scenario, southern alternatives, which is the scenario that would have the highest emissions. Tables in Appendix U, Section U.4.2.2, *Proposed and Potentially Induced Mine Operations*, provide the emissions for the low and medium production scenarios as well.

Table 18-6. Fugitive PM Emissions for Proposed and Potentially Induced Mine Operation – Southern Alternatives, High Production Scenario

Proposed / Potentially Induced Mine	Annual Coal Production Rate (million tons/year)	Fugitive PM Emissions (tons)		
		PM	PM	PM2.5
Otter Creek Mine				
Year 1	20.4	10,560	3,946	368
Year 2	27.2	14,080	5,261	491
Year 3+	34	17,600	6,576	613
Poker Jim Creek-O’Dell Creek Mine				
Year 1	9.6	4,969	1,857	173
Year 2	12.8	6,626	2,476	231
Year 3+	16	8,282	3,095	289
Canyon Creek-Mine				
Year 1	13.2	6,833	2553	238
Year 2	17.6	9,111	3404	317
Year 3+	22	11,388	4255	397

Notes:
Fuel usage is a mix of diesel fuel and gasoline
PM = particulate matter; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less

The Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives would provide access to the proposed Otter Creek Mine and the potentially induced Poker Jim Creek–O’Dell Creek Mine. Construction start and completion dates for the proposed Otter Creek Mine would depend on the construction schedule for the proposed rail line. The Decker Alternatives would provide access to the proposed Otter Creek Mine and to the potentially induced Poker Jim Creek–O’Dell Creek and Canyon Creek Mines. The Decker Alternatives would be the only build alternatives that would provide access to the potentially induced Canyon Creek Mine.

Any build alternative would contribute to cumulative air quality impacts by contributing criteria air pollutant and hazardous air pollutant emissions to emissions from the proposed and potentially induced mines. Cumulative air quality impacts would include impacts on AQRVs. The contributions from the proposed rail line, existing mines, and proposed and potentially induced mines to cumulative impacts would not result in exceedances of ambient air quality standards.

Land management. Fort Keogh facility and vehicle operation would result in a small amount of air pollutant emissions, which would contribute to impacts on ambient air quality. The use of construction equipment and vehicles at the Tongue River Reservoir State Park would result in a small amount of air pollutant emissions, which would contribute to impacts on ambient air quality. BLM estimated emissions for activities that are part of the BLM Draft RMP/EIS preferred alternative (Table 18-7). The Beaver Creek LMP would result in a small amount of air pollutant emissions that would contribute to impacts on ambient air quality.

Any build alternative would contribute to cumulative air quality impacts by contributing criteria air pollutant and hazardous air pollutant emissions to emissions from land management. Cumulative impacts would include impacts on AQRVs.

Table 18-7. Criteria and Hazardous Air Pollutant Emissions for BLM Land Management under the BLM Draft RMP/EIS Preferred Alternative

Resource or Resource Use	Emissions (tons per year)						
	CO	NO _x	SO ₂	PM10	PM2.5	VOC	HAP
Vegetation management	11.3	0.1	0	10.7	1.4	3.1	0.3
Fire management	1,741.9	58.3	13.6	210.7	151.1	97.3	9.7
Forestry and woodland products	2.7	3.9	0.1	10.7	1.3	0.4	0
Livestock grazing	11.3	9.3	0.2	136.9	14.3	4.2	0.4
Recreation trails and travel management	26.6	0.1	0	292.6	30.1	27.1	2.7
General purpose BLM fleet travel	4.6	1.7	0	72.7	7.3	2	0.2
Road maintenance	0.5	1.2	0	1.4	0.2	0.1	0
TOTAL	1,798.9	74.6	13.9	735.7	205.7	134.2	13.3

Notes:

BLM = Bureau of Land Management; CBNG = coal bed natural gas; CO = carbon monoxide; NO_x = nitrogen oxides; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; SO₂ = sulfur dioxide; VOC = volatile organic compound; HAP = hazardous air pollutant

Source: Bureau of Land Management 2007a

- **Energy development.** BLM estimated the criteria and hazardous air pollutant emissions for energy development projects under the preferred alternative of the BLM Draft RMP/EIS (Table 18-8).

Table 18-8. Criteria and Hazardous Air Pollutant Emissions for Energy Development and Production under the BLM Draft RMP/EIS Preferred Alternative

Resource or Resource Use	Emissions (tons per year)						
	CO	NO _x	SO ₂	PM10	PM2.5	VOC	HAP
Oil and Gas Development/ Production							
Oil	347.8	151.7	2.3	34.8	9.3	1,207.5	76.3
Natural Gas	136.1	56.3	0.1	8.8	3.2	38.9	3.9
CBNG	59.6	30.1	0	6.7	2.0	20.6	3.9
Coal Mining	2,121.0	1,817.4	179.8	4,448.4	444.8	144.2	14.4
TOTAL	2,664.5	2,055.5	182.2	4,498.7	459.3	1,411.2	98.5

Notes:

BLM = Bureau of Land Management; CBNG = coal bed natural gas; CO = carbon monoxide; HAP = hazardous air pollutant; NO_x = nitrogen oxides; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

Source: Bureau of Land Management 2007a

BLM's estimate of the total criteria air pollutant emissions is for CBNG development projects involving construction and operation of 18,225 CBNG production wells and

1,730 conventional oil and gas production wells over a 21-year project period. OEA independently estimated that 1,158 oil and gas production wells would be constructed in the four-county area within a 20-year planning cycle. However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*). OEA estimated the criteria air pollutant emissions from projected future oil and gas production using the BLM emissions-per-well factors for construction and operation of CBNG wells (Bureau of Land Management 2007a), assuming that the criteria air pollutant emissions would be proportional to the number of wells constructed and operated. Because the combined construction and operation emission factors for conventional oil and gas wells are higher than the combined emission factors for CBNG wells, OEA assumed that all of the projected 1,158 wells in the four-county area would be conventional oil and gas wells. Table 18-9 summarizes the criteria air pollutant emissions estimated by BLM for the CBNG project and estimated by OEA for projected wells in the four-county area.

CBNG wells and the associated gas processing facilities are subject to Montana DEQ air quality permitting requirements (17 ARM 8.7). Depending on the equipment type (e.g., pump engine, compressor, generator) a permit may require emission controls or best management practices to minimize potential air quality impacts.

Table 18-9. Projected Oil and Gas Development Emission Factors and Life of Project Emissions

	NO _x	PM10	PM2.5	SO	CO	VOC
Emissions Factors: tons per well (BLM)						
Operation	0.028005	0.022943	0.004753	0.002043	0.00639	0.002186
Construction	11.73868	1.032434	0.516984	1.449514	2.754828	0.437738
Estimated Emissions tons total emissions (OEA)						
Operation	48.4	39.7	8.2	3.5	11.1	3.8
Construction	20,308	1,786	894	2,508	4,766	757
Total	20,356	1,826	903	2,511	4,777	761

Notes:

CO = carbon monoxide; NO_x = nitrogen oxides; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; SO = sulfur monoxide; VOC = volatile organic compound

Source: Bureau of Land Management 2007: Appendix A Sections A.1.4, A.2.4

Any build alternative would be constructed and operate in landscapes affected by future oil and gas development. Most of the region around the northern build alternatives has a low potential for oil and gas development. There is moderate potential for development along the Decker Alternatives. Any build alternative would contribute to cumulative air quality impacts by contributing criteria air pollutant and hazardous air pollutant emissions to emissions from the energy development activities. Cumulative air quality impacts would include impacts on AQRVs.⁵

⁵ The cumulative air quality analysis includes CBNG based on the results of BLM studies. For further information, see Appendix U, *Cumulative Impacts Analysis*.

- Construction projects.** The 32.7-mile paving project proposed for Tongue River Road would contribute criteria air pollutant and hazardous air pollutant emissions from fuel combustion. Criteria air pollutant emissions from road paving activities are estimated based on fuel consumption, and are summarized in Table 18-10; hazardous air pollutant emissions are summarized in Table 18-11.

Table 18-10. Criteria Air Pollutant Emissions from Paving of Tongue River Road

Activity	Fuel Usage (gallons)	Criteria Air Pollutants (tons)						
		CO	NO _x	Pb	PM10	PM2.5	SO ₂	VOC
Road paving	66900.00	340.91	50.70	0.07	1.12	1.09	0.21	12.07

Notes:
CO = carbon monoxide; NO_x = nitrogen oxides; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; SO = sulfur monoxide; VOC = volatile organic compound

Table 18-11. Hazardous Air Pollutant Emissions from Paving of Tongue River Road

Activity	Hazardous Air Pollutant Emissions (tons)				
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Ethylbenzene
Road paving	5.04E-04	9.59E-05	5.80E-05	6.90E-05	2.41E-02
	Formaldehyde	n-Hexane	Toluene	Xylene	
Road paving	1.06E-03	9.42E-05	3.86E-02	5.79E-02	

Notes:
Fuel usage is a mix of diesel fuel and gasoline

Leasing the 38.55-acre bull pasture subdivision would contribute criteria air pollutant and hazardous air pollutant emissions. Emissions would result from vehicle usage associated with inspection, management, and similar activities would result in a small amount of air pollutant emissions that would contribute to impacts on ambient air quality.

Any build alternative would contribute to cumulative impacts related to Tongue River Road paving by contributing criteria pollutant and hazardous air pollutant emissions. Any build alternative would contribute to cumulative impacts related to leasing the bull pasture by contributing criteria air pollutant and hazardous air pollutant emissions.

Construction and operation of the proposed rail line, construction and operation of the proposed and potentially induced mines, and construction and operation of other projects would all emit criteria air pollutants and hazardous air pollutants. These emissions, when combined with emissions from existing sources in and beyond the cumulative impacts study area, would lead to cumulative impacts on ambient air quality and AQRVs.

The contribution of impacts from the proposed rail line to cumulative impacts would not result in exceedances of ambient air quality standards or U.S. Environmental Protection Agency Prevention of Significant Deterioration increments. Coal dust emissions from the proposed rail line would make a minor contribution to cumulative visibility impacts.

Furthermore, nitrogen oxide and sulfur oxide emissions from operation of the proposed rail line would be well below levels modeled by BLM in a regional AQRV analysis (see Appendix U, Section U.4.2, *Air Quality*, for a complete description of assessment methods and models). Therefore, construction and operation of the proposed rail line would not contribute to major impairment of visibility or to significant acidic deposition.

In summary, construction and operation of any build alternative would result in cumulative impacts on air quality when combined with the existing, proposed, and potentially induced coal mines; Colstrip Power Plant; Fort Keogh activities; Tongue River Reservoir State Park renovations; BLM land management; Beaver Creek LMP; energy development; Tongue River Road paving project; and bull pasture subdivision leasing. These projects would have to comply with Montana DEQ and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in negligible adverse cumulative impacts on air quality.

18.5.3 Greenhouse Gases and Climate Change

The cumulative impacts analysis of key climate change components is provided in Chapter 5, *Greenhouse Gases and Climate Change*. Impacts from other relevant projects are captured in existing greenhouse gas (GHG) inventories; however, GHG emissions from the proposed Otter Creek Mine and the potentially induced Poker Jim Creek–O'Dell Creek and Canyon Creek Mines are not yet captured in an inventory and were estimated for the Chapter 5 analysis. The scenario with northern alternatives, high coal production, and high terminal capacity growth would result in the most net GHG emissions (Scenario 11, Appendix C, *Coal Production and Markets*). The scenario with northern alternatives, low coal production, and low terminal capacity growth would result in the least emissions (Scenario 3). The remaining scenarios for the northern and southern alternatives would result in net GHG emissions within the range defined by these two scenarios. Accumulated net GHG emissions from 2018 to 2037 would range from a reduction of 1.7 million metric tons of carbon dioxide equivalent (MMT_{CO2e}) to an increase of 81 MMT_{CO2e}, depending on the build alternative, coal production levels, and export terminal capacities. Net results account for displacement of other coals and natural gas. OEA concludes that the net annual life-cycle emissions would range from a negligible positive impact to a small adverse impact.

18.5.4 Coal Dust

Operation of the proposed rail line would result in negligible coal dust impacts based on the applicable ambient air quality standards for particulate matter established to protect human health. Any build alternative could contribute to cumulative impacts of fugitive coal dust by adding to impacts from past, present, and reasonably foreseeable projects.

OEA defined the study area for coal dust impacts as identical to the air quality study area: the southeastern Montana region comprising Big Horn, Custer, Powder River, and Rosebud

Counties, and extending to the nearest Class I and sensitive Class II areas, notably the Northern Cheyenne Indian Reservation. The Class I and sensitive Class II areas are included because impacts on AQRVs are assessed in these areas. However, coal dust concentrations and deposition relative to the National Ambient Air Quality Standards (NAAQS), Montana Ambient Air Quality Standards (Montana AAQS), and deposition guidelines would be within these applicable standards and guidelines. Therefore, analysis of rail line impacts is limited to the area of actual rail operation, which is a smaller portion of the study area. Because the rail line right-of-way would be fenced to prohibit access, OEA analyzed impacts beyond the right-of-way. Concentrations and deposition of coal dust decrease with distance and would be negligible and well within the NAAQS and Montana AAQS.

The coal dust cumulative impacts study area is defined as the area where the build alternatives would overlap with the footprint of each of the other relevant projects.

OEA analyzed whether cumulative impacts could result from the addition of impacts from the proposed rail line to impacts from the existing, proposed, and potentially induced mines. OEA assumed that coal dust emissions from proposed and potentially induced mines would be similar to those from existing mines. Based on the results of the existing mines' particulate matter monitoring programs and modeled concentrations that could be attributed to operation of the proposed rail line (Chapter 4, Section 4.5.1, *Impacts Common to All Alternatives*), OEA determined that cumulative ambient concentrations would be unlikely to cause a violation of the NAAQS or Montana AAQS in the cumulative impacts study area (Appendix U, Section U.4.4, *Coal Dust*).

In summary, construction and operation of any build alternative would result in cumulative coal dust impacts when combined with the existing, proposed, and potentially induced coal mines. These projects would have to comply with Montana DEQ and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in negligible adverse cumulative impacts from coal dust, but recognizes that there could be minor cumulative nuisance impacts.

18.5.5 Noise and Vibration

Although some of relevant projects and actions could increase noise levels, the noise impact areas of these projects and actions and the noise impact areas of the proposed rail line would not overlap. Therefore, no additional cumulative noise and vibration impacts analysis is warranted (Appendix U, Section U.4.5 *Noise and Vibration*), and no cumulative noise and vibration impacts would result.

18.5.6 Biological Resources

18.5.6.1 Vegetation

The proposed rail line would affect vegetation and could combine with impacts from the other relevant projects to result in cumulative impacts on vegetation in the cumulative impacts study area (Appendix U, Section U.4.6.1, *Vegetation*). The contribution of impacts from the proposed rail line to cumulative vegetation impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** The existing coal mines and Colstrip Power Plant are already operating in the vegetation cumulative impacts study area. Continued development of the Spring Creek and Decker Mines would continue to affect vegetation as mining progresses into the mines' RFD areas, which partially overlap the cumulative impacts study area. Mining and reclamation would result in vegetation loss from clearing and fill placement, constraints to plant germination and growth through soil compaction and erosion, contributions to the spread of noxious weeds, effects on plant growth through dust deposition, increased risk of wildfires, altered riparian and floodplain vegetation through altered hydrology, and altered vegetation communities. The dominant undisturbed vegetation communities in the overlap areas include sagebrush steppe (2,252 acres) and lowland prairie/grassland (766 acres). The remaining vegetated areas in the overlap consist of conifer-dominated forest and woodlands (33 acres), floodplain and riparian (35 acres), and deciduous dominated forest and woodland (12 acres).

Vegetation removal does not occur all at once because mining slowly progresses and plant and vegetation reclamation is required (Montana Code Annotated [MCA] 82-4 Part 2). Reclamation includes planting and revegetating mined lands under a plan approved by the Montana Department of Environmental Quality "to make those lands capable of supporting the uses that those lands were capable of supporting prior to any mining or to higher or better uses." Reclamation occurs concurrently with mining and the reestablished plant and vegetation communities must include native plant species that are at least equal in extent and cover to the natural vegetation in the area, have the same growth characteristics as the original vegetation, and are compatible with plant and animal species in the area (MCA 82-4-233). At the end of each mine life, all disturbed mine areas will have been reclaimed and vegetation communities reestablished (MCA 82-4 Part 2).

Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on vegetation such as permanent vegetation loss from clearing and fill placement, constraints to plant germination and growth through soil compaction and erosion, contributions to the spread of noxious weeds, effects on plant growth through dust deposition, increased risk of wildfires, altered riparian and floodplain vegetation

through altered hydrology, and altered vegetation communities as a result of maintenance activities.

- **Proposed and potentially induced coal mines.** Development of the proposed Otter Creek Mine and the potentially induced Poker Jim Creek–O’Dell Creek and Canyon Creek Mines would affect approximately 4,714 acres, 17,560 acres, and 11,644 acres of vegetation, respectively, within the cumulative impacts study area. These impacts assume the entire mine areas would be disturbed at some point during the life of the mines. The mining and reclamation process and applicable statute for the three mines would be the same as described for the Rosebud, Spring Creek, and Decker Mines, as would the described vegetation impacts during mining and reclamation. The extent and degree of these impacts would be based on the acreages of vegetation within the mine boundaries. When mine reclamation is complete, compliance with MCA 82-4 Part 2 will reestablish vegetation.

Any build alternative would contribute to the same cumulative impacts on vegetation as described above for existing coal mines.

- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative vegetation impacts related to Fort Keogh, such as permanent vegetation loss, constrained plant germination and growth, the spread of noxious weeds, and altered vegetation communities. Either of the Decker Alternatives would contribute to similar cumulative vegetation impacts related to the Tongue River Reservoir State Park renovation. Any build alternative would contribute to similar cumulative impacts on vegetation related to BLM Draft RMP/EIS land management plans.
- **Energy development.** Any build alternative would be constructed and operate in landscapes affected by oil and gas development, whether on federal or nonfederal lands. Any build alternative would contribute to cumulative vegetation impacts related to energy development such as permanent vegetation loss, constraints to plant germination and growth, the spread of noxious weeds, effects on plant growth, increased risk of wildfires, altered riparian and floodplain vegetation, and altered vegetation communities. However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** The extent and degree of impacts from construction project on vegetation would depend on the amount of area the project entails. Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative vegetation impacts related to Tongue River Road paving, such as permanent vegetation loss, constraints to plant germination and growth, the spread of noxious weeds, effects on plant growth, increased risk of wildfires, altered riparian and floodplain vegetation, and altered vegetation communities. Any of the Tongue River Alternatives or Tongue River Road Alternatives would

contribute to similar cumulative impacts on vegetation related to leasing the bull pasture subdivision.

In summary, construction and operation of any build alternative would result in cumulative impacts on vegetation when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on vegetation when combined with existing coal mines, Fort Keogh activities, Tongue River Reservoir State Park renovations, Tongue River Road paving project, and bull pasture subdivision leasing. These projects would have to comply with Montana DEQ and other state permits and approvals as well as BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in minor adverse cumulative impacts on vegetation.

18.5.6.2 Wildlife

The proposed rail line would result in the wildlife impacts of increased mortality rates; habitat loss, degradation and fragmentation; displacement of wildlife, creation of barriers to movement; and changed in species composition. These impacts could combine with impacts from the other relevant projects to result in cumulative impacts on wildlife in the cumulative impacts study area (Appendix U, Section U.4.6.2, *Wildlife*). The contribution of impacts from the proposed rail line to cumulative wildlife impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Ongoing mining at the existing mines result in habitat loss (29,466 acres in 2012), habitat degradation due to increased dust and noise levels, and habitat alteration due to mining and subsequent revegetation of mined areas (18,075 acres in 2012). Clearing activities and noise associated with mine activities result in species displacement and avoidance of highly active areas. Also, the disturbance and associated infrastructure presents barriers to movement for wildlife species. A total of 72 sharp-tailed grouse leks and 100 raptor nests are impacted by mine activities; however, all mines have monitoring and reclamation plans in place to monitor these impacts and to avoid or reduce them (MCA 82-4 Part 2).

Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on wildlife by causing habitat loss, degradation, and alteration as well as increases in mortality rates and changes to species distribution and composition.

- **Proposed and potentially induced coal mines**
 - **Proposed Otter Creek Mine.** The development of the proposed Otter Creek Mine would affect primarily riparian, grassland, and shrubland habitats and would result in habitat loss, degradation, and alteration of high-value winter range for white-tailed deer, mule deer, and antelope. Clearing activities and noise associated with mine activities result in species displacement and avoidance of highly active areas. Also, the disturbance and associated infrastructure would present barriers to movement for

- wildlife species. Thirty-four sharp-tailed grouse leks and five raptor nests, including prairie falcon and red-tailed hawk, would be affected by mine activities.
- **Potentially Induced Poker Jim Creek–O’Dell Creek Mine.** The development of the potentially induced Poker Jim Creek–O’Dell Creek Mine area would greatly affect riparian habitats because the coal deposit lies immediately adjacent to the Tongue River and would result in habitat loss, degradation, and alteration of high-value winter range for white-tailed deer, mule deer, and antelope. Clearing activities and noise associated with mine activities result in species displacement and avoidance of highly active areas. Also, the disturbance and associated infrastructure would present barriers to movement for wildlife species. Thirty-one sharp-tailed grouse leks and twelve raptor nests, including great horned owl, red-tailed hawk, American Kestrel, Cooper’s hawk, and long-eared owl, would be affected by mine activities.
 - **Potentially Induced Canyon Creek Mine.** The development of the potentially induced Canyon Creek Mine area would affect primarily woodland and grassland habitats and would result in habitat loss, degradation, and alteration of high-value winter range for white-tailed deer and mule deer. Clearing activities and noise associated with mine activities result in species displacement and avoidance of highly active areas. Also, the disturbance and associated infrastructure would present barriers to movement for wildlife species. Thirty-seven sharp-tailed leks and 31 raptor nests, including great horned owl, red-tailed hawk, and prairie falcon, would be affected by mine activities.

Any build alternative would contribute to the same cumulative impacts on wildlife as described above for existing mines. Impacts of the proposed and potentially induced mines would be reduced through compliance with the reclamation requirements of MCA 82-4 Part 2.

- **Land management.** The BLM Draft RMP/EIS addresses livestock grazing, wildlife habitat, special-designation areas, special recreation areas, national trails, and wilderness study areas. Changes to land management practices on BLM-administered lands would affect wildlife species. The BLM Draft RMP/EIS would increase areas available for livestock grazing and agriculture, affecting wildlife habitat and especially riparian areas. Any build alternative would contribute to cumulative impacts on wildlife related to BLM land management plans by causing habitat degradation, especially in riparian habitats.
- **Energy development.** Energy development within the region would affect wildlife species and their associated habitats. Species displacement due to noise occurs during construction and drilling activities and from continuous mechanical well operations. Mortality rates generally increase in conjunction with oil and gas development especially in smaller species that have more difficulty escaping the vegetation-clearing activities. Impacts on habitats result from vegetation removal for road construction, pad installation, and ditch-digging. Specific disturbance areas vary depending on type of development,

type of well used, and the needed infrastructure for development and production. The lifespan of a project would also vary and would depend on many factors.

All gas and oil projects, whether on federal or nonfederal land, must implement proper reclamation procedures when the wells are abandoned (MCA 82-10-400 et seq.). BLM also requires reclamation of oil and gas wells on BLM-administered lands.

Any build alternative would be constructed and operate in landscapes affected by oil and gas development, whether on federal or nonfederal lands and would contribute to cumulative impacts on wildlife by causing habitat loss, degradation, and alteration as well as increasing mortality rates and causing changes to species distribution and composition. However, these impacts would be reduced by timing limitations stipulations, wildlife monitoring, and coordination with state agencies. In addition, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on wildlife related to Tongue River Road paving by increasing mortality rates and causing loss of habitat due to road widening.

In summary, construction and operation of any build alternative would result in cumulative impacts on wildlife when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on wildlife when combined with existing coal mines and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals as well as BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor adverse cumulative impacts on wildlife.

18.5.6.3 Fish

The proposed rail line would affect fish and would combine with impacts from the other relevant projects to result in cumulative impacts on fish in the cumulative impacts study area (Appendix U, Section U.4.6.3, *Fish*). Construction and operation of the proposed rail line would result in the following impacts on fish: mortality from instream construction, temporary blockage of fish movement, temporary stream dewatering and fish relocation, noise and vibration, water quality (sedimentation and turbidity, and construction materials and petroleum products), removal and alteration of instream and riparian habitats, and altered stream hydraulics (referred to hereafter as the common fish impacts). The contribution of impacts from the proposed rail line to cumulative impacts on fish in each affected project category is summarized as follows.

- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative hydrologic, geomorphic, and water quality changes affecting fish in

conjunction with mine activities and construction and operation of access roads and other facilities. Two perennial fish-bearing water bodies in the cumulative impacts study area would be affected by the proposed and potentially induced coal mines and any build alternative: Otter Creek (affected by the proposed Otter Creek Mine and the potentially induced Poker Jim Creek–O’Dell Creek Mine) and Tongue River (affected by the proposed Otter Creek Mine and both potentially induced mines). In addition, eight smaller intermittent fish-bearing streams in the cumulative impact study area would be affected by the induced mines: Prairie Dog Creek, Whitten Creek, and an unnamed stream by the induced Canyon Creek Mine (Decker Alternatives only); and Black Eagle Creek, Dry Creek, King Creek, Bridge Creek, and an unnamed creek by the induced Poker Jim Creek-O’Dell Creek Mine (all build alternatives).

- **Land management.** Any of the Tongue River Alternatives or Tongue River Road Alternatives would contribute to cumulative water quality impacts affecting fish in the Tongue River, Paddy Fay Creek, and an unnamed stream in conjunction with existing research and land management at Fort Keogh. Any build alternative would contribute to cumulative water quality impacts in conjunction with actions under the BLM Draft RMP/EIS.
- **Energy development.** Any build alternative would contribute to cumulative impacts related to energy development on federal and nonfederal lands, including water quality degradation and habitat alteration affecting fish. However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on hydrology and water quality affecting fish in conjunction with the Tongue River Road paving project. These impacts would occur at up to twelve locations along the Tongue River Road Alternatives, and include the Tongue River and eleven intermittent fish-bearing streams. The Tongue River, Colstrip, and Moon Creek Alternatives would affect up to four fish-bearing streams that are also affected by the road paving project.

In summary, construction and operation of any build alternative would result in cumulative impacts on fish when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on fish when combined with Fort Keogh activities and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor adverse cumulative impacts on fish.

18.5.6.4 Special-Status Species

The proposed rail line would affect special-status species and would combine with impacts from the other relevant projects to result in cumulative impacts on special-status species in the cumulative impacts study area (Appendix U, Section U.4.6.4, *Special-Status Species*). The contribution of impacts from the proposed rail line to cumulative impacts on special-status species in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant**
 - **Special-status wildlife species.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on special-status species by causing habitat loss (29,466 acres in 2012), degradation, and alteration (18,075 acres in 2012); and by increasing mortality rates and causing changes to species distribution and composition. A total of 14 greater sage-grouse leks and 100 raptor nests, including bald eagle, golden eagle, and burrowing owl, as well as approximately 100 noncontiguous acres of prairie dog colonies are affected by mine activities. However, all mines have monitoring and reclamation plans in place to monitor these impacts and to avoid or reduce them (MCA 82-4 Part 2).
 - **Special-status plant species.** Either of the Decker Alternatives would contribute to cumulative impacts on Nuttall desert-parsley and on predicted suitable habitat for multiple special-status plant species. These impacts would include clearing vegetation, constraining plant germination and growth through soil compaction and erosion, contributing to the spread of noxious weeds, affecting plant growth through dust deposition, increasing the risk of wildland fires, altering riparian and floodplain vegetation by changing hydrology, and altering vegetation communities as a result of maintenance activities. The impacts of the Decker Alternatives, when added to the impacts of the existing coal mines, would result in cumulative impacts on Montana Natural Heritage Program-documented Nuttall desert-parsley because the species has been documented in the RFD area of the Spring Creek and Decker Mines and in the Decker Alternatives' rights-of-way. The Decker Alternatives and the RFD area of the Spring Creek and Decker Mines would also affect suitable habitat for Barr's milkvetch, woolly twinpod, slender-branched popcorn-flower, and heavy sedge. Should these species be present in both the rail line right-of-way and the RFD area, there would be a cumulative impact on these plants.
- **Proposed and potentially induced coal mines**
 - **Special-status wildlife species.** Any build alternative would contribute to impacts on special-status species by causing habitat loss, degradation, and alteration; and by increasing mortality rates and causing changes to species distribution and composition. Greater sage-grouse habitat and four greater sage-grouse leks would be impacted by mine activities as well as 15 raptor nests, including bald eagle, golden eagle, and burrowing owl.

- **Special-status plant species.** None of the build alternatives would contribute to cumulative impacts on special-status plant species. Any build alternative would contribute to the same cumulative impacts on predicted suitable habitat for multiple special-status plant species as described above for existing coal mines. The addition of impacts from the build alternatives and impacts from the potentially induced mines would result in cumulative impacts on predicted suitable habitat for Barr's milkvetch, double bladderpod, woolly twinpod, large-flowered beard tongue, slender-branched popcorn-flower, and heavy sedge. Predictable suitable habitat for Nuttall desert-parsley would be affected in the cumulative impacts area of just the Decker Alternatives and the potentially induced Poker Jim Creek–O'Dell Creek and Canyon Creek Mines. Should these species be present in both the rail rights-of-way and the mine areas, there would be a cumulative impact on these plants.
- **Land management**
 - **Special-status wildlife species.** Any build alternative would contribute to cumulative impacts on special-status wildlife species related to BLM land management plans by causing habitat degradation, especially in riparian habitats.
 - **Special-status plant species.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on special-status plant species related to Fort Keogh operations by causing permanent vegetation loss, constraining plant germination and growth through soil compaction and erosion, contributing to the spread of noxious weeds, and altering vegetation communities because of maintenance activities.
- **Energy development**
 - **Special-status wildlife species.** Any build alternative would contribute to cumulative impacts on special-status wildlife species by causing habitat loss, degradation, and alteration and by increasing mortality rates and causing changes to species distribution and composition. These cumulative impacts could be reduced on BLM-administered lands because BLM strives to maintain special-status species occurrence and habitat by using a variety of methods, including but not limited to, wildlife monitoring programs, timing limitation stipulations, and surface occupancy stipulations. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
 - **Special-status plant species.** None of the build alternatives would contribute to cumulative impacts on special-status plant species in conjunction with BLM energy development because BLM activities would maintain or enhance the presence of documented special-status plants. Any build alternative would contribute to cumulative impacts in conjunction with energy development outside of BLM-administered land, by clearing vegetation, constraining plant germination and growth through soil compaction and erosion, contributing to the spread of noxious weeds,

affecting plant growth through dust deposition, increasing the risk of wildland fires, altering riparian and floodplain vegetation by changing hydrology, and altering vegetation communities as a result of maintenance activities. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

- **Construction projects**

- **Special-status wildlife species.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on special-status wildlife species related to Tongue River Road paving by increasing mortality rates and causing loss of habitats due to widening of the road.
- **Special-status plant species.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on special-status plant species related to Tongue River Road paving by clearing vegetation, constraining plant germination and growth through soil compaction and erosion, contributing to the spread of noxious weeds, affecting plant growth through dust deposition, increasing the risk of wildland fires, altering riparian and floodplain vegetation by changing hydrology, and altering vegetation communities as a result of maintenance activities.

In summary, construction and operation of any build alternative would result in cumulative impacts on special-status species when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on special-status species when combined with existing coal mines, Fort Keogh activities, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals as well as BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in minor adverse cumulative impacts on special-status species.

18.5.7 Water Resources

18.5.7.1 Surface Water

The proposed rail line would affect surface water and could combine with impacts from the other relevant projects to result in cumulative impacts on surface water in the cumulative impacts study area (Appendix U, Section U.4.7.1, *Surface Water*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on surface water through physical alteration of surface water, degradation of water quality, and temporary surface water use.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to the same cumulative impacts on surface water as described above for existing mines.
- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts on surface water related to Fort Keogh by degradation of water quality. Either of the Decker Alternatives would contribute to cumulative impacts related to the Tongue River Reservoir State Park renovation by physical alteration of surface water and degradation of water quality. Any build alternative would contribute to cumulative impacts related to BLM land management plans through degradation of water quality. Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to forest management under the Beaver Creek LMP through physical alteration of surface water and degradation of water quality.
- **Energy development.** Any build alternative would contribute to cumulative impacts related to BLM energy development, including degradation of water quality. Any build alternative would contribute to cumulative impacts related to energy development outside of BLM-administered lands by physical alteration of surface water, degradation of water quality, and temporary surface water use. However, none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Tongue River Road paving by physical alteration of surface water, degradation of water quality, and temporary surface water use.

In summary, construction and operation of any build alternative would result in cumulative impacts on surface water when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on surface water when combined with existing coal mines, Fort Keogh activities, Tongue River Reservoir State Park renovations, Beaver Creek LMP, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals, any BLM-required mitigation measures, and Clean Water Act mitigation requirements. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in adverse cumulative impacts on surface water.

18.5.7.2 Groundwater

The proposed rail line would affect groundwater and would combine with impacts from the other relevant projects to result in cumulative impacts on groundwater in the cumulative impacts study area (Appendix U, Section U.4.7.2, *Groundwater*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts by altering infiltration and recharge characteristics, temporarily disrupting water balances, closing wells, and temporarily degrading water quality. Cumulative groundwater impacts would occur near either of the Colstrip Alternatives and in the area near either of the Decker Alternatives. BLM prepared an EIS to assess the impacts of coal mining in the Powder River region, which includes Rosebud, Powder River, and Big Horn Counties (Bureau of Land Management 1984). The Rosebud, Spring Creek, and Decker Mines were included in this BLM EIS, which estimated that mine operations would require 3.04 to 4.1 billion gallons (9,340 to 12,590 acre-feet) of groundwater per year, depending on the mining alternative. The BLM EIS estimated that approximately 275 to 425 existing groundwater wells would be destroyed or impaired. Construction of the Colstrip and Colstrip East Alternatives would permanently close 11 and 9 wells, respectively, and would require an estimated 297.2 and 390.4 million gallons (912 and 1,198 acre-feet) of water, respectively. Construction of the Decker and Decker East Alternatives would permanently close one well each, and would require an estimated 726.0 million and 736.8 million gallons (2,228 and 2,261 acre-feet) of water, respectively. Additional wells would be closed in the area near the coal mines. The Decker Alternatives would close one groundwater well within 5 miles of the Spring Creek and Decker Mines. The Colstrip Alternatives would close three groundwater wells within 5 miles of the Rosebud Mine and Colstrip Power Plant.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to the same cumulative impacts on groundwater as described above for the existing mines. Because the proposed rail line is proposed to be completed by 2018, cumulative groundwater impacts would combine with impacts from construction and operation of the proposed Otter Creek Mine. Build alternatives overlapping in time and space with the proposed Otter Creek Mine include the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives. Because construction of the potentially induced Poker Jim Creek–O’Dell Creek and Canyon Creek Mines is not expected to begin until 2021 and 2025, respectively, any cumulative groundwater impacts associated with these two mines would be limited to impacts resulting from operation of either of the Decker Alternatives. Although unlikely, operation impacts could include temporary water quality degradation if any contaminants (e.g., diesel fuel) released were to reach groundwater through infiltration. Any cumulative impacts related to groundwater quantity or quality would be limited geographically and would not be

permanent, lasting only during construction of the build alternative in these areas. Both the proposed Otter Creek Mine and the proposed rail line would involve closing wells. The Tongue River East Alternative, Colstrip East Alternative, Tongue River Road East Alternative, and Moon Creek East Alternative would close two groundwater wells within 5 miles of the proposed Otter Creek Mine. The Tongue River Alternative, Colstrip Alternative, Tongue River Road Alternative, and Moon Creek Alternative would close one groundwater well within 5 miles of the proposed Otter Creek Mine. None of the build alternatives would close a groundwater well near the potentially induced mines.

- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Fort Keogh by temporarily disrupting water balances as water is drawn from nearby wells for construction of the proposed rail line. These impacts would last the duration of construction and would not affect the existing groundwater uses in the area. Under administrative water use rights, Fort Keogh would use up to 36 acre-feet (11.7 million gallons) per year (currently allowed to use up to 26.7 acre-feet [8.7 million gallons] per year) from surface water and/or groundwater for conducting research, dust abatement, reclamation, or other administrative purposes. Irrigation water comes from surface water (Yellowstone River). Between 395.5 and 783.3 million gallons of water would be required to construct the rail line, depending on the alternative that goes through Fort Keogh.

Any build alternative would contribute to cumulative impacts related to the BLM Draft RMP/EIS by disrupting water balances and degrading water quality. Combined with a potential reduction in the rate of groundwater recharge from BLM's vegetation management activities, groundwater withdrawal during construction of any build alternative would not affect the existing groundwater uses in the area. Cumulative impacts on groundwater quality from contaminant released during rail operation combined with potential improvements in groundwater quality from improved watershed conditions would not be measurable.

- **Energy development.** Any build alternative would contribute to cumulative impacts by disrupting water balances and degrading water quality. These impacts would not be permanent. The extent of cumulative impacts on groundwater quantity would depend on whether construction of the proposed rail line withdraws groundwater from wells that are located near the existing or future oil and gas wells. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Tongue River Road paving by altering infiltration and recharge characteristics. The extent of the altered infiltration would be correlated with the footprints (length and width) of the road and rail line, which represent a small area

within the groundwater cumulative impacts study area. Any cumulative impacts associated with local groundwater recharge are not likely to be measurable.

Any of the Tongue River Alternatives or Tongue River Road Alternatives would contribute to cumulative impacts related to leasing the bull pasture by altering infiltration and recharge characteristics, temporarily disrupting water balances, and temporarily degrading water quality. The extent and degree of these impacts would depend on what the future lessor would decide to do with the land parcel.

In summary, construction and operation of any build alternative would result in cumulative impacts on groundwater when combined with the proposed and potentially induced coal mines BLM land management, and energy development. Some build alternatives would result in cumulative impacts on groundwater when combined with existing coal mines, Fort Keogh activities, bull pasture subdivision leasing, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals, any BLM-required mitigation measures, and Clean Water Act mitigation requirements. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor adverse cumulative impacts on groundwater.

18.5.7.3 Floodplains

The proposed rail line would affect floodplains and would combine with impacts from the other relevant projects to result in cumulative impacts on floodplains in the cumulative impacts study area (Appendix U, Section U.4.7.3, Floodplains). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on floodplains by causing a decrease in floodplain storage capacity, a diversion of flood flows, a constriction of flood flows, and a decrease in floodplain floodwater retention. Approximately 69 acres of floodplain would be affected as mining continues in Rosebud Mine. The Colstrip Alternatives would affect 13 acres of Federal Emergency Management Agency-mapped floodplain. The Colstrip Alternative would affect 88 acres of Natural Resources Conservation Service (NRCS)-mapped floodplains and Colstrip East Alternative would affect 42 acres of NRCS-mapped floodplains.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to the same cumulative impacts on floodplains as described above for existing mines. The proposed Otter Creek Mine would affect 45 acres of NRCS-mapped floodplains and the potentially induced Poker Jim Creek-O'Dell Creek Mine would affect 488 acres of NRCS-mapped floodplains. The potentially induced Canyon Creek Mine would not affect any mapped floodplains.

- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Fort Keogh by causing a decrease in floodplain floodwater retention.
- **Energy development.** None of the build alternatives would contribute to cumulative impacts related to BLM energy development because BLM would not allow development in floodplains. Energy development outside of BLM-administered land could contribute to cumulative impacts by causing a decrease in floodplain storage capacity, diversion of flood flows, constriction of flood flows, and decrease in floodplain floodwater retention. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Tongue River Road paving by causing a decrease in floodplain storage capacity, a diversion of flood flows, a constriction of flood flows, and a decrease in floodplain floodwater retention. Any of the Tongue River Alternatives and Tongue River Road Alternatives would contribute to the same cumulative impacts related to leasing the bull pasture as described above for the Tongue River Road paving project.

In summary, construction and operation of any build alternative would result in cumulative impacts on floodplains when combined with the proposed and potentially induced coal mines and energy development (lands not administered by BLM). Some build alternatives would result in cumulative impacts on floodplains when combined with existing coal mines, Fort Keogh activities, the Tongue River Road paving project, and bull pasture subdivision leasing. These projects would have to comply with Montana DEQ and other state permits and approvals, and Clean Water Act mitigation requirements. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in minor adverse cumulative impacts on floodplains.

18.5.7.4 Wetlands

The proposed rail line would affect wetlands and would combine with impacts from the other relevant projects to result in cumulative impacts on wetlands in the cumulative impacts study area (Appendix U, Section U.4.7.4, *Wetlands*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts by reducing wetland habitat through placing fill, compromising water quality function and degrading wetland water quality, decreasing wetland stormwater and floodwater storage capacity, altering wetlands through maintenance activities, and depositing pollutants. Continued mining of the Rosebud Mine would affect 24.3 acres of wetlands and continued mining of the

Spring Creek and Decker Mines would affect 13.1 acres of wetland. Either of the Colstrip Alternatives would contribute to cumulative impacts on wetlands in conjunction with the Rosebud Mine's wetland impacts. Either of the Decker Alternatives would contribute to cumulative impacts on wetlands in conjunction with the Spring Creek and Decker Mines' wetland impacts.

- **Proposed and potentially induced coal mines.** Any build alternative and the proposed and potentially induced coal mines would contribute to the same cumulative impacts as described above for the existing coal mines. The Otter Creek Mine would affect 74.9 acres of wetland. The Tongue River Alternative, Colstrip Alternative, Tongue River Road Alternative, and Moon Creek Alternative would affect 1 acre of wetlands in the cumulative impact study area that is associated with the Otter Creek Mine; the Tongue River East Alternative, Colstrip East Alternative, Tongue River Road East Alternative, and Moon Creek East Alternative would affect 3 acres of wetland. The Decker Alternative would affect 0.5 acre of wetlands in the cumulative impact study area that is associated with the Otter Creek Mine; the Decker East Alternative would affect 0.4 acre. The potentially induced Poker Jim Creek–O'Dell Creek Mine would affect 70.2 acres of wetlands in the cumulative impact study area and the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives would affect between 2.4 acres and 3.9 acres in the cumulative impact area associated with the potentially induced Poker Jim Creek–O'Dell Creek Mine. The potentially induced Poker Jim Creek–O'Dell Creek Mine would affect 63.5 acres of wetlands in the cumulative impact area associated with the Decker Alternatives, which would affect between 4.9 and 5.7 acres in the cumulative impact area. The potentially induced Canyon Creek Mine would affect 20.6 acres of wetlands in the cumulative impact area and the Decker Alternatives would affect between 7.5 and 8.2 acres in the cumulative impact study area.
- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives and activities at Fort Keogh would contribute to cumulative impacts by degrading wetland water quality and altering wetland vegetation. Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives and the Beaver Creek LMP would contribute to cumulative impacts by degrading wetland water quality.
- **Energy development.** None of the build alternatives would contribute to cumulative impacts related to energy development on BLM-administered lands because BLM would not allow oil and gas well development in wetlands, and activities within 300 feet of wetlands would have to be designed to maintain or improve wetland functionality. The build alternatives and energy development would contribute to cumulative impacts outside of BLM-administered lands by reducing wetland habitat through fill placement, compromising water quality function, degrading wetland water quality, decreasing wetland stormwater and floodwater storage capacity, altering wetlands through maintenance activities, and depositing pollutants. Any cumulative impacts would be reduced by compliance with the requirements of the Clean Water Act, Montana

reclamation statutes and rules governing protection of wetlands during oil and gas well development and reclamation, and best management practices that would be implemented during construction. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives and the Tongue River Road paving project would contribute to cumulative impacts by reducing wetland habitat through fill placement, compromising water quality function, degrading wetland water quality, decreasing wetland stormwater and floodwater storage capacity, altering wetlands through maintenance activities, and depositing pollutants.

In summary, construction and operation of any build alternative would result in cumulative impacts on wetlands when combined with the proposed and potentially induced coal mines and energy development (lands not administered by BLM). Some build alternatives would result in cumulative impacts on wetlands when combined with existing coal mines, Fort Keogh activities, the Beaver Creek LMP, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals, and Clean Water Act mitigation requirements. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in adverse cumulative impacts on wetlands.

18.5.8 Visual Resources

The proposed rail line would affect visual resources and would combine with impacts from the other relevant projects to result in cumulative impacts on visual resources in the cumulative impacts study area (Appendix U, Section U.4.8, *Visual Resources*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on visual resources by increasing the amount of rail infrastructure, clearing vegetation, grading, and transforming undisturbed lands in scenic areas near existing mines and the Colstrip Power Plant.
- **Proposed and potentially induced coal mines.** Any build alternative would increase the amount of rail-related facilities and infrastructure in a visual environment that is minimally developed and valued for its scenic resources. Cumulative impacts would be the same as those described above for existing mines.
- **Energy development.** Any build alternative would contribute to cumulative impacts on visual resources associated with energy development projects. Cumulative impacts would be associated with vegetation removal, grading, and excavation activities, and

introduction of industrial equipment and structures. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).

- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to impacts associated with the Tongue River Road paving project by increasing transportation infrastructure in an area where such features are minimal. The proposed rail line would also result in vegetation removal, cut and fill, and the permanent alteration of landforms in the cumulative impacts study area.

In summary, construction and operation of any build alternative would result in cumulative impacts on visual resources when combined with the proposed and potentially induced coal mines and energy development. Some build alternatives would result in cumulative impacts on visual resources when combined with existing coal mines, the Colstrip Power Plant, and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits as well as BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in moderate to highly adverse cumulative impacts on visual resources.

18.5.9 Cultural Resources

The proposed rail line would affect cultural resources and would combine with impacts from the other relevant projects to result in cumulative impacts on cultural resources in the cumulative impacts study area (Appendix U, Section U.4.9, *Cultural Resources*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts on cultural resources by removing or demolishing cultural resources, causing additional damage or alteration to the resources such that they would no longer convey their significance, or hindering accessibility of cultural resources.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to the same cumulative impacts on cultural resources as described above for existing coal mines, but to a substantially higher degree because of the additional acreage that would be affected by mine activity.
- **Land management.** Any of the Tongue River Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to ongoing surface disturbances at Fort Keogh. The Moon Creek Alternatives would not affect the Hogback Pasture but would contribute to the cumulative impacts of ongoing surface disturbances at Fort Keogh. Any build alternative would contribute to cumulative

impacts related to land management under the BLM Draft RMP/EIS by increasing surface and subsurface disturbances, potentially causing the removal, damage, or demolition of cultural resources or hindering accessibility of cultural resources, which may affect each disturbed site's ability to convey its historic significance.

- **Energy development.** Any build alternative would contribute to cumulative impacts on cultural resources by increasing the area potentially disturbed by construction and operation activities related to the exploration for coal, oil, and natural gas. Cumulative impacts would be same as described above for existing coal mines. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** The Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives would contribute to cumulative impacts on cultural resources. Impacts would be the same as those described above for existing coal mines. The Tongue River Alternatives, Colstrip Alternatives, and Tongue River Road Alternatives would contribute to cumulative impacts related to leasing the bull pasture to the extent that cultural resources are present.

In summary, construction and operation of any build alternative would contribute to cumulative impacts on cultural resources when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on cultural resources when combined with existing coal mines, Fort Keogh activities, and bull pasture subdivision leasing. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in moderate to highly adverse cumulative impacts on cultural resources.

18.5.10 Land Resources

18.5.10.1 Land Use

The proposed rail line would affect land use and could combine with impacts from the other relevant projects to result in cumulative impacts on land use in the cumulative impacts study area (Appendix U, Section U.4.10.1, *Land Use*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** None of the build alternatives would contribute to cumulative land use impacts when combined with the existing operation of the coal mines within their present boundaries. However, any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative land use impacts when combined with the impacts from the expansion of the Spring Creek Mine and the Rosebud Mine

into the RFD areas. These impacts would result from the conversion of land to new uses, primarily from grazing to nongrazing uses. The Spring Creek Mine and Rosebud Mine expansions would result in the loss of approximately 5,606 acres and 6,422 acres, respectively, of grazing land while mine activities occur.

- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative impacts on land use when combined with the proposed and potentially induced coal mines through the conversion of land from its present use to mineral extraction and mining infrastructure, or from grazing to nongrazing uses. The proposed Otter Creek Mine and the potentially induced Poker Jim Creek–O’Dell Creek and Canyon Creek Mines would result in the loss of approximately 6,845 acres, 15,773 acres, and 6,989 acres, respectively, of grazing land while mine activities occur. Any build alternative would also require the acquisition and conversion of privately owned land for the railroad right-of-way, including properties operated for agriculture and ranching. Of these affected properties, nine would also be within the development footprint for the potentially induced Poker Jim Creek–O’Dell Creek Mine and one would be within the development footprint for the proposed Otter Creek Mine.
- **Land management.** Any build alternative would contribute to cumulative impacts related to land management under the BLM Draft RMP/EIS by adding to the amount of land in the cumulative impacts study area that would be converted from its present use, primarily from grazing to nongrazing uses.
- **Energy development.** Any build alternative would contribute to cumulative impacts on land use when combined with energy development by increasing the amount of land that would be converted from present uses, primarily from grazing to nongrazing uses. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Tongue River Road improvement projects by adding to the amount of land that would change ownership and by changing the use of the land in the right-of-way.

In summary, construction and operation of any build alternative would contribute to cumulative impacts on land use when combined with the proposed and potentially induced coal mines, BLM land management, and energy development. Some build alternatives would result in cumulative impacts on land use when combined with existing coal mines and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in moderate to highly adverse cumulative impacts on land use.

18.5.10.2 Recreation

The proposed rail line would affect recreation and would combine with impacts from the other relevant projects to result in cumulative impacts on recreation in the cumulative impacts study area (Appendix U, Section U.4.10.2, *Recreation*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any of the Colstrip Alternatives or Decker Alternatives would contribute to cumulative impacts by adding visual disturbances to the ongoing activities at these mine sites. Block Management Area users could have views of the mines and either of the Colstrip Alternatives, but not simultaneously from the same vantage point. Tongue River Reservoir State Park users could have views of the mines and either of the Decker Alternatives but not simultaneously from the same vantage point. User enjoyment of either recreational resource would be diminished by the increased industrial presence associated with the proposed rail line in this mostly rural and agricultural landscape.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative impacts by adding industrial elements to the visual landscape, which may affect user enjoyment, and affecting recreational hunting or wildlife viewing opportunities in areas of the Custer National Forest at the southern end of the northern alternatives and along the northern portion of either Decker Alternative.
- **Energy development.** Any build alternative would contribute to cumulative impacts by diminishing visual character and affecting recreational hunting or wildlife viewing opportunities. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would contribute to cumulative impacts related to Tongue River Road paving by increasing visual disturbances.

In summary, construction and operation of any build alternative would result in cumulative impacts on recreation when combined with the proposed and potentially induced coal mines and energy development. Some build alternatives would result in cumulative impacts on recreation when combined with existing coal mines and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor to moderate adverse cumulative impacts on recreation.

18.5.10.3 Section 4(f) and Section 6(f) Resources

The Tongue River Alternatives and the Tongue River Road Alternatives would affect one property that is subject to Section 4(f): the Spotted Eagle Recreation Area (Appendix U, Section U.4.10.3, Section 4(f) and Section 6(f)). None of the other relevant projects would affect the Spotted Eagle Recreation Area. Therefore, no additional cumulative impact analysis is warranted, and no cumulative Section 4(f) and Section 6(f) impacts would result.

Potential cumulative impacts on recreational properties—including those eligible for protection under Section 4(f) and Section 6(f)—are described in Section 18.5.10.2, *Recreation*. Potential cumulative impacts on cultural resources—including those potentially eligible for protection under Section 4(f)—are described in Section 18.5.9, *Cultural Resources*.

18.5.10.4 Hazardous Waste Sites

Construction and operation of the proposed rail line would not affect or be affected by any hazardous waste sites. Therefore, no cumulative impacts analysis is warranted (Appendix U, Section U.4.10.4, *Hazardous Waste Sites*), and no cumulative impacts would result.

18.5.11 Geology, Soils, and Paleontological Resources

18.5.11.1 Geology and Soils

The proposed rail line would affect geology and soils and would combine with impacts from the other relevant projects to result in cumulative impacts on geology and soils in the cumulative impacts study area (Appendix U, Section U.4.11.1, *Geology and Soils*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Land management.** Any build alternative would contribute to cumulative impacts in association with management practices under the BLM Draft RMP/EIS. However, the potential for overlap is low in Custer and Rosebud Counties and medium in Powder River County, where land-management activities are not likely to occur near the right-of-way. No cumulative impacts are expected.
- **Construction projects.** Any of the Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, or Moon Creek Alternatives would be crossed by the Tongue River Road paving project. Any of the Tongue River Alternatives or Tongue River Road Alternatives would be closest to the bull pasture leasing project. These build alternatives would contribute to cumulative impacts affecting topography, slope failure, and soil erosion.

In summary, construction and operation of any build alternative would contribute to cumulative impacts on geology and soils when combined with BLM land management. Some build alternatives would result in cumulative impacts on geology and soils when

combined with the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in negligible to minor adverse cumulative impacts on geology and soils.

18.5.11.2 Paleontological Resources

The proposed rail line would affect paleontological resources and would combine with impacts from the other projects to result in cumulative impacts on paleontological resources in the study area. The contribution of the proposed rail line to cumulative impacts is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** The Colstrip Alternatives and Decker Alternatives would contribute to cumulative impacts on paleontological resources such as removing or demolishing resources due to blasting and excavation of rock and removal of sediments. When combined with impacts from the Colstrip Alternatives, development of the Rosebud Mine RFD would affect from 9,768 to 9,822 acres, depending on the build alternative. All of these acres would be across rock classed as PFYC 3, moderate or unknown sensitivity. When combined with the impacts from the Decker Alternatives, development of the Spring Creek and Decker Mine RFD would affect from 8,358 to 8,489 acres. All of these acres would be across rock units with a PFYC of 3.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative impacts on paleontological resources in combination with the proposed and potentially induced coal mines. When combined with impacts from any build alternative, the proposed Otter Creek Mine would affect from 6,763 to 8,957 acres, depending on the build alternative. As many as 1,336 acres would be classed as PFYC 5, high sensitivity, and the remainder as PFYC 3. When combined with impacts from any build alternative, the potentially induced Poker Jim Creek–O’Dell Creek Mine would affect from 19,991 to 22,185 acres. As many as 1,336 acres would be classed as PFYC 5, and the remainder as PFYC 3. When combined with impacts from the Decker Alternatives, the potentially induced Canyon Creek Mine would affect from on 14,367 to 14,498 acres. All of these acres would be classed as PFYC 3.
- **Land management.** The Tongue River Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives would contribute to cumulative impacts related to ongoing surface disturbances at Fort Keogh. Any of these build alternatives would contribute to cumulative impacts related to land management under the BLM Draft RMP/EIS by increasing surface and subsurface disturbances, potentially causing the removal, damage or demolition of paleontological resources or increasing accessibility for collection of or inadvertent damage to paleontological resources.
- **Energy development.** Any build alternative would contribute to cumulative impacts on paleontological resources by increasing the area potentially disturbed by construction and

operation related to the exploration for coal, oil, and natural gas. Cumulative impacts would be the same as described for existing coal mines.

- **Construction projects.** The Tongue River Alternatives, Colstrip Alternatives, Tongue River Road Alternatives, and Moon Creek Alternatives would contribute to cumulative impacts on paleontological resources when combined with the Tongue River Road paving project. Impacts would be the same as described for coal mines. The Tongue River Alternatives, Colstrip Alternatives, and Tongue River Road Alternatives would contribute to cumulative impacts related to leasing the bull pasture subdivision to the extent that paleontological resources are present.

In summary, construction and operation of any build alternative would result in cumulative impacts on paleontological resources when combined with the proposed and potentially induced coal mines and energy development. Some build alternatives would result in cumulative impacts on paleontological resources when combined with the existing coal mines and the Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits and approvals as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable projects and actions, would result in minor adverse cumulative impacts on paleontological resources.

18.5.12 Energy Resources

The proposed rail line would affect energy resources and would combine with impacts from the other relevant projects to result in cumulative impacts on energy resources in the cumulative impacts study area (Appendix U, Section U.4.12, *Energy Resources*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** Any build alternative could contribute to cumulative impacts by increasing demand for diesel fuel in the cumulative impacts study area. Under the high production scenario, diesel fuel consumption from construction and operation of the Moon Creek East Alternative (the build alternative with the highest predicted overall diesel fuel consumption) would be 58 percent of the diesel fuel consumption of the existing coal mines. Electricity consumption from construction and operation of the build alternatives would be less than 0.1 percent of the electricity consumption of the existing coal mines.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative impacts by increasing demand for diesel fuel and electricity in the cumulative impacts study area. The total diesel fuel energy consumption for constructing the proposed and potentially induced mines would range from 4.12 million gallons of diesel fuel for the low production scenario to 10.31 million gallons for the high production scenario for the northern alternatives and 14.85 million gallons for the high production scenario for the southern alternatives. The total diesel fuel consumption for

operating the proposed and potentially induced mines would range from 106.67 million gallons for the low production scenario to 244.68 million gallons for the high production scenario for the northern alternatives and 301.53 million gallons for the high production scenario for the southern alternatives (Appendix C, *Coal Production and Markets*). Diesel fuel consumption from construction and operation of the Moon Creek East Alternative would be 58 percent of the diesel fuel consumption of the proposed and potentially induced coal mines for the high production scenario. Electricity consumption from construction and operation of the build alternatives would be less than 0.1 percent of the electricity consumption of the proposed and potentially induced coal mines. Cumulative impacts would be associated with increased demand for diesel fuel and electricity in the cumulative impacts study area.

- **Energy development.** Any build alternative would contribute to cumulative impacts by increasing demand for diesel fuel in the cumulative impacts study area. The total energy consumption on a diesel fuel-equivalent basis for future oil and gas production over the 20-year period (based on the 2013 annual rates of oil and gas production) would be 35.4 million gallons.⁶ Any build alternative would increase demand for diesel fuel in the cumulative impacts study area. Cumulative impacts on energy resources would result from the addition of impacts from the build alternatives to impacts from future oil and gas production in conjunction with energy development. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any build alternative would contribute to cumulative impacts on energy by increasing demand for diesel fuel in the cumulative impacts study area. The total energy consumption for Tongue River Road paving would be 425,500 million gallons of fuel for operation of all necessary equipment. An additional 425,500 gallons of diesel fuel would be consumed for road maintenance over the life cycle of the paved road.

The proposed rail line would contribute to increased demand for diesel fuel in the cumulative impacts study area. Diesel fuel consumption for construction and operation of any build alternative for the high production scenario (152 million gallons for the Moon Creek East Alternative), when added to impacts from the other relevant projects (210 million gallons for operation of the existing mines; 255 million gallons for construction and operation of the proposed and potentially induced mines; 35 million gallons for future oil and gas production; and 0.4 million gallons for Tongue River Road paving), would represent approximately 7 percent of annual state-wide diesel fuel consumption. Electricity consumption for any build alternative combined with other relevant projects would represent approximately 8.5 percent of the annual state-wide electricity consumption. These impacts, in conjunction with impacts from the other relevant projects, would not affect the availability of energy resources (diesel fuel, gasoline, electricity) or result in the need to construct and operate additional

⁶ 35.4 million gallons is equivalent to 4,916,000 million British thermal units (245,820 million British thermal units per year) at a conversion factor of 5.825 million British thermal units per barrel of diesel fuel.

infrastructure for the production and distribution of energy in the cumulative impacts study area.

In summary, construction and operation of any build alternative would contribute to cumulative impacts on energy resources when combined with the existing, proposed, and potentially induced coal mines, energy development, and Tongue River Road paving project. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would result in negligible adverse cumulative impacts on energy resources.

18.5.13 Socioeconomics

The proposed rail line would affect socioeconomics and would combine with impacts from the other relevant projects to result in cumulative impacts on socioeconomics in the cumulative impacts study area (Appendix U, Section U.4.13, *Socioeconomics*). The contribution of impacts from the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

- **Existing coal mines and Colstrip Power Plant.** The Colstrip Alternatives and Decker Alternatives would contribute to cumulative impacts by generating additional employment opportunities, fiscal revenues, and demand for housing and public services in the proximity of the existing coal mines. Because the existing mines are part of the baseline for analysis of impacts for the build alternatives, the cumulative effect of impacts from the build alternatives and impacts of these mines is captured in Chapter 15, *Socioeconomics*.
- **Proposed and potentially induced coal mines.** Any build alternative would contribute to cumulative impacts by displacing livestock operations and farming. The build alternatives would generate employment opportunities and contribute to the migration of workers to the cumulative impacts study area, mostly during the 3-year construction period. These opportunities would add to employment opportunities at the mines. Projected housing availability would not be sufficient to accommodate the new demand for housing, particularly in Rosebud, Custer, Powder River, and Big Horn Counties. The excess demand would be addressed by temporary housing, by long-distance commuting, or by a combination of both. The use of temporary housing increases the demand for public services in the communities where the temporary housing is located. Long distance commuting increases traffic on roads and associated needs for maintenance and risk of accidents. OEA expects the larger communities in Rosebud, Custer, Powder River, and Big Horn Counties to be the most affected, including Miles City, Forsyth, Colstrip, and Hardin.
- **Land management.** Any build alternative would generate employment and income opportunities and would reduce the availability of lands for recreational and farming

opportunities or for conservation. Some of the land management projects would counteract such effects by making lands available for grazing and recreation or by reducing the demand for fire response.

- **Energy development.** Any build alternative would add to long-term employment, earnings, and fiscal revenues generated by energy development in Rosebud, Custer, Powder River, and Big Horn Counties. The economic base of the cumulative impacts study area would be expected to rely increasingly on energy sector workers and capital, altering the makeup of the livelihoods of people living in communities in the cumulative impacts study area. It should be noted that none of the currently approved wells would be in the project area or near the build alternatives (Appendix U, Section U.3.3.4, *Energy Development*).
- **Construction projects.** Any build alternative would facilitate development of the proposed Otter Creek Mine and potentially increase the demand for pavement of connecting roads, such as the Tongue River Road. The simultaneous construction of these and other relevant projects—such as the Keystone XL Pipeline (Fallon County, Montana) and Youngs Creek Mine and Brook Mine (Sheridan County, Wyoming)—and the proposed rail line would cause a cumulative and simultaneous increase in the demand for labor from the available workforce and demand for local public services.

In summary, construction and operation of any build alternative would contribute to cumulative impacts on socioeconomics when combined with the proposed and potentially induced coal mines, land management, and energy development. Some build alternatives would result in cumulative impacts on socioeconomics when combined with existing coal mines and construction projects. These projects would have to comply with Montana DEQ and other state permits as well as any BLM-required mitigation measures. OEA concludes that the direct impacts from the proposed rail line when combined with impacts from past, present, and reasonably foreseeable projects and actions would range from positive cumulative impacts on socioeconomics by contributing to employment and the migration of workers into the cumulative impacts study area—mostly during the 3-year construction period—to moderate to highly adverse cumulative impacts on socioeconomics by displacing economic activities such as farming.

18.5.14 Environmental Justice

OEA determined that only noise impacts from the proposed rail line could result in high and adverse⁷ impacts on minority and low-income populations. With the exception of the Decker East Alternative, operation of any build alternative would result in disproportionately high and adverse noise impacts on minority and low-income populations. OEA examined the other relevant projects and the distances to these same minority and low-income populations

⁷ The terms *high* and *adverse* are derived from Executive Order 12898, which directs agencies to identify and consider “disproportionately high and adverse” human health or environmental effects of their actions on minority and low-income communities.

that would be affected by the proposed project and determined that there would be no impact from these other projects. Therefore, OEA concluded that no cumulative disproportionately high and adverse human health or environmental impacts on minority and low-income populations would occur (Appendix U, Section U.4.14, *Environmental Justice*).