

Chapter 2

Proposed Action and Alternatives

This chapter describes the Coalition's proposed rail line, the process for developing alternatives to the Coalition's proposal, and the final range of reasonable alternatives that OEA evaluated in this [Draft EIS](#). The alternatives evaluated in this [Draft EIS](#), as described below, are the Whitmore Park Alternative (the Coalition's preferred alternative), the Indian Canyon Alternative, and the Wells Draw Alternatives (collectively, the Action Alternatives). OEA also evaluated the No-Action Alternative, which would occur if the Board were to deny the Coalition's request for Board authority to construct and operate a rail line.

2.1 Proposed Action

The Coalition proposes to construct and operate an approximately 85-mile single-track rail line to connect the Uinta Basin (the Basin) to the existing interstate rail network. The proposed rail line would extend from two terminus points in the Basin near Myton, Utah and Leland Bench, Utah to a proposed connection with the existing Union Pacific (UP) Provo Subdivision near Kyune, Utah. The Coalition has entered into or intends to enter into agreements with Drexel Hamilton Infrastructure Partners (Drexel Hamilton), Rio Grande Pacific Corporation (RGPC) and the Ute Indian Tribe of the Uintah and Ouray Reservation (Ute Indian Tribe). If the Board were to authorize construction and operation for the proposed rail line, the Coalition states that Drexel Hamilton would be responsible for financing and commercialization of the proposed rail line and RGPC would operate and maintain it. The Coalition expects that the Ute Indian Tribe would become an equity partner in the proposed rail line.¹

The Coalition anticipates that rail traffic on the proposed rail line would primarily consist of trains transporting crude oil from the Basin to markets across the United States. The Coalition also expects that trains would transport frac sand into the Basin for use in the oil and gas extraction industry. The total volume of rail traffic would depend on future markets for crude oil, which is driven by global demand and capacity at oil refineries. Depending on those future market conditions, the Coalition estimates that as few as 3.68 or as many as 10.52 trains could operate on the proposed rail line each day, on average.² That estimate includes between 3.68 and 9.92 crude oil trains, including both unloaded trains entering the Basin and loaded trains leaving the Basin, and between 0 and 0.6 frac sand trains, including both loaded trains entering the Basin and unloaded trains leaving the Basin. The Coalition expects that the majority of crude oil transported on the proposed rail line would originate from new extraction projects in the Uinta Basin or increased production at existing oil wells. The Coalition does not expect that the proposed rail line would divert existing oil truck traffic to rail transportation for the purposes of serving existing oil refineries in Salt Lake City in the short term.

¹ As used in this [Draft EIS](#), references to the Coalition as the project applicant also refer to any private partners that may be involved in the construction and operation of the proposed rail line, including Drexel Hamilton and RGPC.

² In its petition, the Coalition has stated that projections of future rail traffic are based on conditions existing before the ongoing COVID-19 pandemic, and that it anticipates these conditions caused by the pandemic will be temporary in nature.

The Coalition expects that shippers could also use the proposed rail line to transport various heavy and bulk commodities found in the Basin, such as soda ash, phosphate, natural gas, oil shale, gilsonite, natural asphalt, limestone, bentonite, heavy clay, aggregate materials, bauxite, low-sulfur coal, and agricultural products. These products would be transported in cars added to crude oil trains or frac sand trains. The Coalition does not anticipate that the volume of other commodities would be large enough to warrant dedicated trains.

The Coalition anticipates that shippers of crude oil or other third parties would construct terminals at the two terminus points of the proposed rail line near Myton and Leland Bench to facilitate the transportation of crude oil. The Coalition is not proposing to construct terminals at the two terminus points as part of its petition filed with the Board, and the Board would not have a role in permitting those facilities if another non-railroad party were to construct them. Because the potential terminals are not part of the proposed action being evaluated in this [Draft EIS](#), those facilities are discussed separately in Chapter 3, Section 3.15, *Cumulative Impacts*.

2.2 Alternatives

This section discusses the process that was used to develop the alternatives considered in this [Draft EIS](#), routes that were considered but were not analyzed in detail, and the final set of reasonable alternatives that were carried forward for detailed review. OEA incorporates by reference the following source documents referred to in this section.

The Board's website (www.stb.gov) and the Board-sponsored project website (uintabasinrailwayeis.com) include all documents incorporated by reference.

- 2014–2015 Utah Department of Transportation (UDOT) Studies:
 - *Alternatives Feasibility Report* (UDOT 2014a)
 - *Alternatives-Development and Screening Methodology Report* (UDOT 2014b)
 - *Uinta Basin Railroad Feasibility Study Summary Report* (UDOT 2015)
- 2019–2020 Coalition Reports:
 - *Uinta Basin Railway: Evaluation of Potential Route Alternatives* (Coalition 2019a)
 - *Uinta Basin Railway: Supplemental Route Selection Information* (Coalition 2020)

2.2.1 Alternatives Development

The National Environmental Policy Act (NEPA) requires that federal agencies consider reasonable alternatives to the proposed action. To be reasonable, an alternative must meet the project purpose and need and must be logistically feasible and practical to implement. In railroad construction cases, OEA typically determines the range of reasonable alternatives by first developing a list of conceptual routes. OEA then carefully considers those potential alternatives in consultation with appropriate agencies, other stakeholders, and the public. In determining whether an alternative is reasonable, OEA considers the totality of circumstances for each potential alternative, including the following:

- **Logistical constraints.** Some potential alternatives may not be logistically feasible because they would involve especially steep grades or high curvature ratios that would increase the risk of derailment and other accidents. A potential alternative may also be unreasonable if it would

require unusual or unique design features, such as especially long tunnels or long viaducts that may be impossible or impractical to construct or to operate safely.

- **Length of the rail line.** In general, longer rail lines are more expensive to construct and operate and are likely to result in more environmental impacts than shorter rail lines. A conceptual route that is significantly longer than other potential alternatives may not be reasonable under NEPA if it does not offer potential benefits in terms of lower environmental impacts, improved operational safety, or increased economic efficiency relative to other potential alternatives.
- **Disproportionately significant environmental impacts.** A potential alternative that would cross areas containing especially sensitive environmental or cultural resources may ~~be~~ not be reasonable under NEPA when it is clear from initial desktop review that the potential alternative would result in significant environmental impacts that cannot be mitigated and that would be substantially greater than the impacts associated with other potential alternatives. OEA believes it would be a misuse of public and agency time and resources to analyze in detail a potential alternative that the Board would not be able to ultimately authorize as its environmentally preferable alternative.
- **Construction and operation costs.** Because freight rail lines are typically constructed and operated by private companies using private investment funds, the costs of constructing and operating a new rail line are ultimately passed along to shippers in the form of rates charged by the rail line operator to transport freight. If the cost of constructing and operating a new rail line is prohibitively high, it could make it impossible for the operator to offer rates that would be competitive with other means of transportation. Some potential alternatives may, therefore, be economically infeasible because they would entail prohibitively high construction and operation costs.

Because each rail line construction case is unique, OEA does not have established thresholds for any of the above parameters. Therefore, to determine the range of reasonable alternatives, OEA carefully considered the totality of circumstances for each potential alternative, including agency and public comments received during the scoping process.³

The three Action Alternatives examined in this ~~Draft~~ EIS were developed over the course of several years of analysis by the Utah Department of Transportation (UDOT) and the Coalition, and later OEA. Because the Basin is surrounded by high mountains and plateaus, there are very few feasible routes that a rail line could follow that would allow for freight trains to operate within modern standards of safety and efficiency. This section summarizes the processes that UDOT, the Coalition, and OEA used to evaluate the feasibility of conceptual routes and determine the final range of alternatives. Additional details regarding the alternative development process, including the reports referenced in this section and listed in Section 2.2, *Alternatives*, are available to the public on the

³ OEA recognizes that other agencies may have the responsibility to assess the feasibility of potential alternatives under regulations other than NEPA, including Section 404 of the Clean Water Act (33 U.S.C. § 1344). Section 404 requires that the applicant consider all practicable alternatives and demonstrates the proposed action is the Least Environmental Damaging Practicable Alternative (LEDPA). Although it is beyond the scope of the Board's environmental review under NEPA to present a full analysis for the purposes of Section 404, OEA believes that the information summarized in this section and provided in detail in the 2014–2015 UDOT Studies, the 2019–2020 Coalition Reports, and other sources referenced in this section should be reasonably sufficient to support the identification of practicable alternatives per the section 404(b)(1) guidelines. OEA also believes that the information provided in Chapter 3, *Affected Environment and Environmental Consequences*, is reasonably sufficient to support the selection of the LEDPA.

Board's website (www.stb.gov) and the Board-sponsored project website (www.uintabasinrailwayeis.com).

In 2014 and 2015, UDOT completed alternative feasibility studies that examined the feasibility of constructing a rail line to connect the Basin to the interstate railroad network (2014–2015 UDOT Studies).⁴ The 2014–2015 UDOT Studies identified 26 conceptual routes for a potential rail line and applied four levels of screening to determine which, if any, of those routes could feasibly be constructed. In the first-level screening, UDOT assessed whether each route would meet the project's purpose and need. The second-level screening involved a high-level engineering analysis to determine whether the routes that passed the first-level screening would have a maximum grade of no more than 2.4 percent, which UDOT considered to be the maximum grade that a heavy freight rail line can safely and efficiently operate. In the third-level screening, UDOT overlaid the conceptual routes that passed the second-level screening with available geospatial data and eliminated those that would have disproportionate environmental impacts on residences, known resources of cultural and historic value, and unique or particularly sensitive wildlife habitat. In the fourth-level screening, UDOT conducted a more detailed engineering analysis of the conceptual routes that passed the third-level screening and eliminated the routes that would be infeasible to construct.

In 2019 and 2020, the Coalition issued their route alternative selection reports (2019–2020 Coalition Reports)⁵, which detailed the Coalition's efforts to reassess the conceptual routes identified in the 2014–2015 UDOT Studies. In addition to the 26 routes that UDOT identified, the Coalition also considered three additional routes that it had identified. The Coalition then conducted a three-level screening process to eliminate routes that would not be reasonable alternatives. In the first-level screening, the Coalition conducted a desktop analysis and eliminated routes that would cross areas of particularly sensitive wildlife habitat, areas known to contain important cultural resources, or highly developed areas with many residences, buildings, and infrastructure. In the second-level screening, the Coalition conducted a high-level engineering review of the routes that passed the first-level [screening](#) and eliminated those that would be infeasible to construct and operate; the primary criterion that the Coalition used in this second-level screening was a maximum grade of 2.5 percent, which is slightly higher than UDOT's criterion of 2.4 percent maximum grade. In the third-level screening, the Coalition eliminated several conceptual routes that passed the second-level screening due to being largely duplicative with other routes that passed the second-level screening. For routes that passed all three levels of screening, the Coalition provided additional information regarding the relative technical and economic feasibility of the route and the results of desktop review of potential environmental impacts.

The Coalition proposed that OEA consider three routes as potential alternatives in the EIS, based on UDOT's and the Coalition's screening results. Those proposed alternatives were the Indian Canyon Alternative, the Wells Draw Alternative, and an alignment referred to as the Craig Route. After considering the comments that OEA received during the EIS scoping process, which are available to the public on the Board's website, the Coalition proposed an additional route as a potential alternative. That route, the Whitmore Park Alternative, although largely similar to the Indian Canyon Alternative, would avoid some sensitive habitat and some residential areas relative to the Indian Canyon Alternative. The Coalition also concluded, based on new information received during

⁴ See *Alternatives Feasibility Report* (UDOT 2014a); *Alternatives-Development and Screening Methodology Report* (UDOT 2014b); and *Uinta Basin Railroad Feasibility Study Summary Report* (UDOT 2015).

⁵ See *Uinta Basin Railway: Evaluation of Potential Route Alternatives* (Coalition 2019a) and *Uinta Basin Railway: Supplemental Route Selection Information* (Coalition 2020).

scoping, that the Craig Route would not meet the Coalition's purpose and need and requested that OEA eliminate that route from further review.

Throughout 2019 and 2020, OEA conducted its own analysis of the conceptual routes that were considered by UDOT and the Coalition. OEA also requested and received from the Coalition additional, more detailed engineering information about some of the routes that were eliminated during the screening analysis that the Coalition conducted. OEA also consulted with and carefully considered comments from federal, state, and local agencies; tribes; other potentially affected stakeholders; and the public about potential alternatives during the scoping process.

Based on the analyses conducted by UDOT, the Coalition, and OEA, as well as comments submitted during scoping, OEA concluded that, of the conceptual routes that were considered at various times, only three routes would be reasonable under NEPA. OEA notes that the major reason that conceptual routes were found to be infeasible is due to the prevailing, challenging topography (e.g., mountain elevations, steep grades) surrounding the Basin. All of the routes identified by UDOT and the Coalition that OEA ultimately found infeasible would require substantial cut-and-fill and large or numerous bridges. Most routes would have also required numerous or large tunnels to pass through mountains. For example, the Coalition estimates that the least-cost route, the Indian Canyon Alternative, would cost approximately 1.29 billion dollars to construct, which is equivalent to approximately 16 million dollars per mile, while a typical rail line constructed on relatively flat terrain typically costs between approximately 1 and 2 million dollars per mile to construct. The other two reasonable alternatives analyzed in detail in this [Draft EIS](#), the Whitmore Park Alternative and the Wells Draw Alternative, would have estimated construction costs of approximately 1.35 billion dollars and 2.14 billion dollars, respectively.

2.2.2 Routes Considered but Not Analyzed in the EIS

This section briefly discusses the conceptual routes that OEA considered but did not analyze in detail in this [Draft EIS](#) because they would be logistically infeasible or unreasonable to construct and operate. Additional information regarding the conceptual routes that OEA did not analyze in detail is provided in the 2014–2015 UDOT Studies and the 2019–2020 Coalition Reports, which are publicly available on the Board's website (www.stb.gov) and on the Board-sponsored project website (www.uintabasinrailwayeis.com). Notably, none of the routes are entirely unique and many include substantial overlap with other routes. Where appropriate, this section notes the similarities between routes.

2.2.2.1 Craig Route

The Craig Route would extend approximately 185 miles from terminus points in the Basin to an existing rail line near Axial, Colorado. From the terminus points in the Basin, the Craig Route would proceed generally northward then turn and proceed generally eastward, crossing the Green River approximately 5 miles south of Jensen, Utah. The route would then proceed southeasterly, entering Colorado approximately 3 miles northwest of Dinosaur, Colorado, and would connect to the Deseret Power Railroad (DPR) south of Dinosaur. The Craig Route would use approximately 13 miles of the DPR to proceed eastward and would depart the DPR approximately 2 miles west of the Deserado Mine. It would then proceed generally eastward to connect to the UP Craig Subdivision near the railroad timetable station at Axial.

The Craig Route was first identified in the 2019–2020 Coalition Reports, which concluded that the route would be logistically feasible to construct because, despite having a substantially longer length relative to other conceptual routes, it would traverse less challenging terrain. For this reason, OEA initially decided to carry the Craig Route forward for review in the EIS scoping process as a potential alternative. During scoping, however, OEA received comments raising concerns regarding the potential environmental impacts of the Craig Route, as well as the reasonableness and feasibility of that proposed alternative, as detailed below.

The Coalition submitted a comment letter to OEA explaining that, based on information obtained during scoping, the Coalition no longer believes the Craig Route would meet the project's purpose and need. First, the Coalition stated that two segments of the Craig Route are currently private rail lines, not common-carrier rail lines, which means that the Coalition would need to obtain the right to operate over those segments in order to construct and operate the Craig Route. Second, the Coalition noted that if the Craig Route were constructed, shippers in the Basin would gain access only to a rail line owned and operated by UP. According to the Coalition, the lack of access to two existing carriers on the Craig Route would result in higher rates for shippers and could affect the Coalition's ability to attract shippers and obtain financing. Third, the Coalition stated that the economic feasibility of the Craig Route could be affected by the high maintenance and operating costs on the UP Craig Subdivision, to which the Craig Route would connect. Because trains from the proposed rail line would be the primary source of rail traffic on the UP Craig Subdivision, the Coalition stated it could be forced to either purchase that UP line or incur substantial costs to ensure that it is adequately maintained. Finally, the Coalition noted the comments from federal, state, and local agencies discussed below regarding the disproportionate potential impact of the Craig Route on wildlife and other resources relative to the other proposed build alternatives.

The U.S. Department of the Interior, Bureau of Land Management (BLM) submitted comments requesting that OEA eliminate the Craig Route from detailed analysis in the EIS due to the likelihood of significant environmental impacts on specific resources in Colorado. BLM explained that the Craig Route would be inconsistent with BLM management decisions and would require an amendment to applicable BLM Resource Management Plans (RMPs) to permit a right-of-way. BLM identified potential significant environmental impacts on important greater sage-grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) habitat; important winter habitat for big game species, including pronghorn (*Antilocapra Americana*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*); and habitat for the black-footed ferret (*Mustela nigripes*) in the Wolf Creek Management Area. Other issues raised by BLM regarding the Craig Route include potential visual impacts and impacts on several threatened and endangered plant species.

The National Park Service submitted comments identifying potential environmental impacts—including increased air pollution, noise, and altered daytime viewsheds and dark night sky views—of the Craig Route on Dinosaur National Monument (DNM) that would be caused by the Craig Route's close proximity (within 5 miles) to DNM. By comparison, the Indian Canyon Alternative and the Wells Draw Alternative would avoid these impacts because both routes would be more than 30 miles away from the DNM.

Colorado Parks and Wildlife (CPW) submitted comments raising concerns about the Craig Route due to the area's extremely high value for numerous wildlife species and the potential of the proposed route to adversely affect those species. CPW identified eight properties in which CPW maintains an interest that would be bisected by the Craig Route, potentially resulting in the fragmentation of wildlife habitat or affecting public use of the properties. CPW noted that the Craig Route would cross

numerous tributary streams of the White River and the Yampa River, which serve as spawning areas for threatened and endangered fish species. In addition, CPW commented that the Craig Route would cross crucial winter range areas and migration routes for big game species and raised concerns regarding potential impacts on greater sage-grouse, sharp-tailed grouse, raptors, and black-footed ferrets. Finally, CPW identified several proposed projects in the vicinity of the Craig Route that could potentially result in significant cumulative impacts on biological resources when considered in conjunction with the proposed rail line, including the Transwest Express Transmission Line, Energy Gateway South Transmission Line, Tri-State's Colowyo coal mine expansion, federal oil and gas leasing projects, and proposals for sand and gravel mining.

In comments submitted during scoping, the commissioners of Moffat County, Colorado did not ask OEA to eliminate the Craig Route, but raised several issues unique to the Craig Route that would need to be addressed if that route were carried forward in the EIS. Among these issues are the lack of the Craig Route's connection to an existing common carrier rail line in Colorado, which would require the Coalition to acquire rights to operate over a private rail line in order to implement the proposed rail line if the Craig Route were authorized. Moffat County also pointed to potential bottleneck issues related to adding new rail traffic to parts of the proposed route that could make the Craig Route infeasible. Moffat County further noted the existence of several wildlife conservation easements along the Craig Route corridor and cited potential rail crossings that would need to intersect public roads and landowner concerns.

OEA's independent analysis of the Craig Route concluded that the route, due to its substantially longer length, would require a greater number of water body crossings than other proposed alternatives, would affect a greater area of wetlands, would likely require greater volumes of water during construction, and would have a greater potential to affect cultural resources, such as undiscovered archeological sites. The Craig Route is also the only one of the three initially proposed alternatives that would cross the Green River, which contains designated critical habitat for federally listed endangered fish species that are endemic to the Colorado River basin.

Based on the serious concerns discussed in this section, OEA concluded that the Craig Route would not be a reasonable alternative because it might not provide shippers with a viable rail alternative to trucking and would have the potential for disproportionately significant environmental impacts, including visual, noise, and air quality impacts on DNM and water quality impacts on the Green River related to the proposed crossing of that river.

2.2.2.2 Craig City Route

The Craig City Route would extend generally eastward approximately 181 miles from terminus points in the Basin to a connection with an existing rail line near Craig, Colorado. From the Basin, the route would head east toward and along DPR into Colorado before generally following U.S. Highway 40 (US 40) northeast to the rail connection near Craig.

The 2014–2015 UDOT Studies concluded that the Craig City Route would not meet the purpose and need of the proposed rail line and did not consider the route further. The 2019–2020 Coalition Reports concluded that the Craig City Route would be substantially duplicative of the Craig Route and did not consider the Craig City Route further as a distinct route. OEA reviewed the available information and concluded that, like the Craig Route, the Craig City Route is not a reasonable alternative because it might not provide shippers with a viable alternative to trucking and would have the potential for disproportionately significant environmental impacts, including visual, noise,

and air quality impacts on DNM and water quality impacts on the Green River related to the proposed crossing of that river.

2.2.2.3 Axial-Meeker Route

The Axial-Meeker Route would extend approximately 183 miles from terminus points in the Basin to a connection with an existing privately owned rail line near Axial, Colorado. From the Basin, the route would head east toward and along the existing DPR into Colorado before following Colorado State Highway 64 (CO 64) to Meeker, Colorado. It would then turn north and follow Colorado State Highway 13 (CO 13) to the rail connection near Axial.

The 2014–2015 UDOT Studies concluded that the Axial-Meeker Route would not meet the purpose and need of the proposed rail line and did not consider the route further. The 2019–2020 Coalition Reports concluded that the Axial-Meeker Route would be substantively duplicative of the Craig Route and did not consider it further as a distinct route. OEA reviewed the available information and concluded that the Axial-Meeker Route is not a reasonable alternative because, like the Craig Route, it might not provide shippers with a viable alternative to trucking and would have the potential to result in disproportionately significant environmental impacts, including visual, noise, and air quality impacts on DNM and water quality impacts on the Green River related to the proposed crossing of that river.

2.2.2.4 Echo Canyon Route

The Echo Canyon Route would extend generally northwest approximately 157 miles from terminus points in the Basin to an existing UP rail line near Echo, Utah. From the Basin, the route would extend westward up the Duchesne River valley toward Wolf Creek Pass. It would then descend northwesterly from the summit, paralleling the Provo River through Kamas, Utah toward Echo. The route would require approximately 12.4 miles of tunnels to traverse areas of high elevation surrounding the Basin.

The 2014–2015 UDOT Studies concluded that the Echo Canyon Route would not meet the project's purpose and did not consider the route further. The 2019–2020 Coalition Reports found that the Echo Canyon Route would be feasible to construct in the first-level screening but eliminated the route from further review in the second-level screening due to disproportionate impacts on the built and natural environments. Specifically, the 2019–2020 Coalition Reports concluded that the Echo Canyon Route would pass through extensively developed residential areas in the vicinity of Park City, Utah, and would likely require the relocation of or result in impacts on many residences and other aspects of the built environment. OEA reviewed the available information and concluded that the Echo Canyon Route is not a reasonable alternative because it would result in disproportionately significant impacts on residential areas near Park City, potentially including the relocation of numerous residences in that area, without offering benefits in terms of lower impacts on other environmental resources. OEA also concluded that the potential costs associated with the relocations of numerous residences and the acquisition of numerous properties in the Park City area would result in a prohibitively high construction cost that would make the Echo Canyon Route impractical to construct.

2.2.2.5 Sowers Canyon Route

The Sowers Canyon Route would extend generally southwest approximately 104 miles from terminus points in the Basin to a connection with an existing UP rail line near Kyune, Utah. From the Basin, the route would follow Sowers Canyon by way of Antelope Canyon and then travel through three tunnels to reach the Whitmore Park Plateau to the west of Nine Mile Canyon Road. It would then parallel Emma Park Road to Kyune. The Sowers Canyon Route would be identical along much of its length to the Minnie Maud Canyon—Sowers Canyon Route and the Argyle Canyon—Sowers Canyon Route, all three of which would pass through Sowers Canyon. It would also be similar to the Indian Canyon Alternative, sharing the same terminus points in the Basin and the same connection to the existing UP rail line near Kyune.

The 2014–2015 UDOT Studies concluded that the Sowers Canyon Route would be logistically feasible to construct and operate. However, UDOT recommended that the Sowers Canyon Route not be considered further because it would be largely similar to the Indian Canyon Alternative but would result in more significant environmental impacts. The 2019–2020 Coalition Reports reevaluated the Sowers Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Sowers Canyon Route is not a reasonable alternative because it would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.6 Minnie Maud Canyon—Sowers Canyon Route

The Minnie Maud Canyon—Sowers Canyon Route would extend generally southwest approximately 112 miles from terminus points in the Basin to a connection with an existing rail line near Kyune. From the Uinta Basin, the route would follow Antelope Canyon to Sowers Canyon, where two tunnels would provide a connection to Minnie Maud Canyon. It would then extend southward through Nine Mile Canyon to the Whitmore Park Plateau, where it would parallel Emma Park Road to Kyune. The Minnie Maud Canyon—Sowers Canyon Route would be identical along much of its length to the Sowers Canyon Route and the Argyle Canyon—Sowers Canyon Route, all three of which would pass through Sowers Canyon. It would also be similar to the Indian Canyon Alternative, sharing the same terminus points in the Basin and the same connection to the existing UP rail line near Kyune.

The 2014–2015 UDOT Studies concluded that the Minnie Maud Canyon—Sowers Canyon Route would meet the project's purpose and need and would be logistically feasible to construct and operate. However, UDOT's third-level screening concluded that the route would have higher potential for environmental impacts than the largely similar Sowers Canyon Route because it would require a greater number of water crossings and would cross a larger area of wetland and cross larger areas of sensitive wildlife habitat, including greater sage-grouse habitat and black-footed ferret habitat. The 2019–2020 Coalition Reports reevaluated the Minnie Maud Canyon—Sowers Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Minnie Maud Canyon—Sowers Canyon Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous

stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.7 Argyle Canyon—Sowers Canyon Route

This conceptual route would extend generally southwest approximately 125 miles from terminus points in the Basin to a connection with an existing UP rail line near Kyune, Utah. From the Basin, the route would follow Antelope Canyon to Sowers Canyon, where a tunnel would connect to Argyle Canyon. It would then follow Argyle Canyon for approximately 13 miles before following Nine Mile Canyon south to the Whitmore Park Plateau, where it would head west along Emma Park Road to Kyune. The Argyle Canyon—Sowers Canyon Route would be identical along much of its length to the Sowers Canyon Route and the Minnie Maud Canyon—Sowers Canyon Route, all three of which would pass through Sowers Canyon. It would also be similar to the Indian Canyon Alternative, sharing the same terminus points in the Uinta Basin and the same connection to the existing UP rail line near Kyune.

The 2014–2015 UDOT Studies concluded that the Argyle Canyon—Sowers Canyon Route would meet the project’s purpose and need and would be logistically feasible to construct and operate. However, UDOT’s third-level screening concluded that the route would have higher potential for environmental impacts than the largely similar Sowers Canyon Route. The 2019–2020 Coalition Reports reevaluated the Argyle Canyon—Sowers Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Argyle Canyon—Sowers Canyon Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.8 Nine Mile Canyon—Wells Draw Route

The Nine Mile Canyon—Wells Draw Route would extend generally southwest approximately 110 miles from termini in the Basin to a connection with an existing UP rail line near Kyune, Utah. From the Basin, the route would follow Wells Draw Road south through Gate Canyon and would then parallel Nine Mile Canyon Road to the Whitmore Park Plateau. It would then head west along Emma Park Road toward the rail connection near Kyune.

The 2014–2015 UDOT Studies concluded that the Nine Mile Canyon—Wells Draw Route would be logistically infeasible to construct due to a maximum grade of approximately 3.5 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Nine Mile Canyon—Wells Draw Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Nine Mile Canyon—Wells Draw Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.9 Nine Mile Canyon—Upper Green River Canyon Route

The Nine Mile Canyon—Upper Green River Canyon Route would extend generally southwest approximately 144 miles from terminus points in the Basin to a connection with an existing UP rail line near Kyune, Utah. From the Basin, the route would follow Nine Mile Canyon Road through Nine Mile Canyon from the Green River south to the Whitmore Park Plateau. It would then head west along Emma Park Road toward the rail connection near Kyune.

The 2014–2015 UDOT Studies concluded that the Nine Mile Canyon—Upper Green River Canyon Route would be impractical to construct due to the height of the canyon walls in the Green River Canyon, the high water flows that fill the canyon floor, and the lack of continuous bench or beach on which to build the rail line. The 2019–2020 Coalition Reports concluded in the first-level screening that the route would ~~be~~ not be reasonable due to unavoidable impacts on Nine Mile Canyon and Green River Canyon. Nine Mile Canyon contains numerous significant cultural resources, including extensive rock art and archeological features created by the Fremont culture and the Ute people, while Green River Canyon contains significant natural resources, including the Green River, which supports numerous aquatic species, including federally and state listed protected species. OEA reviewed the available information and concluded that the Nine Mile Canyon—Upper Green River Canyon Route is not a reasonable alternative because it would result in disproportionately significant impacts on cultural and natural resources in Nine Mile Canyon and Green River Canyon.

2.2.2.10 Green River Canyon Route

The Green River Canyon Route would extend generally south approximately 159 miles from terminus points in the Basin to a connection with an existing UP rail line near the junction of U.S. Highway 6 (US 6) and Interstate 70 (I-70). From the Basin, the route would follow the Green River from Wild Horse Bench south toward the rail connection.

The 2014–2015 UDOT Studies concluded that the Green River Canyon Route would be impractical to construct due to the height of the canyon walls in the Green River Canyon, the high water flows that fill the canyon floor, and the lack of continuous bench or beach on which to build the rail line. The 2019–2020 Coalition Reports concluded in the first-level screening that the route would not be reasonable due to potential impacts on Green River Canyon. Green River Canyon contains significant natural resources, including the Green River, which supports numerous aquatic species, including federally and state listed protected species. OEA reviewed the available information and concluded that the Green River Canyon Route is not a reasonable alternative because it would result in disproportionately significant impacts on natural resources in Green River Canyon.

2.2.2.11 Thompson Canyon Route

The Thompson Canyon Route would extend generally south approximately 120 miles from terminus points in the Basin to a connection with an existing UP rail line east of Crescent Junction, Utah. From the Basin, it would generally follow Willow Creek to She Canyon and would then follow Bogart Canyon and Thompson Canyon south toward the rail connection.

The 2014–2015 UDOT Studies concluded that the Thompson Canyon Route would be logistically infeasible to construct due to a maximum grade of approximately 4.0 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Thompson Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent.

OEA reviewed the available information and concluded that the Thompson Canyon Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.12 Sego Canyon Route

The Sego Canyon Route would be largely similar to the Thompson Canyon Route. It would extend generally south approximately 120 miles from terminus points in the Basin to a connection with an existing UP rail line east of Crescent Junction, Utah. From the Basin, it would generally follow Willow Creek to She Canyon and would then follow Bogart Canyon and Thompson Canyon south toward the rail connection.

The 2014–2015 UDOT Studies concluded that the Sego Canyon Route would be logistically infeasible to construct due to a maximum grade of approximately 3.8 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Sego Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Sego Canyon Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.13 Mack Route

As described in the 2014–2015 UDOT Studies, the Mack Route would extend approximately 145 miles generally southeast from terminus points in the Basin to a connection with an existing UP rail line near Mack, Colorado. Although the route passed first-, second-, and third-level screening in the 2014–2015 UDOT Studies, UDOT ultimately eliminated it after more detailed engineering analysis in the fourth-level screening. Specifically, UDOT concluded during field review that the steep slopes and loose material in the Baxter pass area would make construction and operation of a rail line impractical due to the susceptibility of the geology to rockslides. UDOT also concluded that the steep slopes in the area through which the route would pass would make the construction of the rail main line and associated siding logistically infeasible.

The 2019–2020 Coalition Reports revised the Mack Route to accommodate new terminus points in the Basin. The revised route would extend approximately 155 miles from two terminus points near Myton, Utah and Leland Bench, Utah to a connection with an existing UP rail line near Mack. From Leland Bench and Myton, the route would extend northeasterly, crossing the Uinta River south of Fort Duchesne, Utah, then south-southeast to cross the Green River. It would then turn south, crossing the White River, then follow Bitter Creek Canyon to a summit tunnel through the East Tavaputs Plateau. From the summit tunnel, the route would follow Atchee Wash, exiting the Book Cliffs, then traverse Grand Valley to connect to the UP Green River Subdivision. Portions of the Mack Route would be identical to the Westwater Route, the East Rifle Route, the West Rifle Route, the Craig Route, and other conceptual routes.

Approximately 90.4 miles of the Mack Route would cross relatively open terrain. The remaining mileage, however, would cross rugged terrain characterized by mountains and deep valleys. Crossing that topography would require many areas of cut-and-fill, numerous bridges, and approximately 5.1 miles of tunnels to maintain a maximum grade of 2.5 percent. Due to the substantially longer length of the Mack Route relative to other conceptual routes and the significantly higher amounts of regrading that would be required, the Coalition concluded that the Mack Route would not be economically feasible to construct and operate. For the purpose of comparison, the Coalition estimated that the Mack Route would cost approximately 2.78 billion dollars to construct, which is well over twice the estimated construction cost of the least-cost route, the Indian Canyon Alternative. Desktop analysis conducted by the Coalition concluded that the Mack Route would also have greater potential for significant environmental impacts relative to other routes under consideration.

OEA reviewed the available information and concluded that the Mack Route is not a reasonable alternative because the construction and maintenance costs associated with the route's substantial length, as well as the extensive regrading, tunneling, and numerous bridges and other structures that would be required, would make the route impractical to construct and operate.

2.2.2.14 Mack-Evacuation Creek Route

The Mack-Evacuation Creek Route would extend generally southeast approximately 132 miles from terminus points in the Basin to a connection with an existing UP rail line near Mack, Colorado. From the Basin, it would travel east to follow the abandoned Uintah Railway route before following Baxter Pass Road south toward the UP rail connection.

The 2014–2015 UDOT Studies concluded that the route would be logistically infeasible to construct due to a maximum grade of approximately 4.8 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Mack-Evacuation Creek Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Mack-Evacuation Creek Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.15 Mack-Park Canyon Route

The Mack-Park Canyon Route would extend approximately 190 miles between terminus points in the Basin and a connection with an existing UP rail line near Mack, Colorado. From the Basin, it would travel east to the DPR and would follow the DPR toward Rangely, Colorado. It would then head southwest along Rio Blanco County 23 to Evacuation Creek and, then, to Baxter Pass. South of the pass, it would generally follow the abandoned narrow-gauge Uintah Railway route to the railroad connection near Mack.

The 2014–2015 UDOT Studies concluded that the Mack-Park Canyon Route would be logistically infeasible to construct due to a maximum grade of approximately 2.7 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the

Mack-Park Canyon Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Mack-Park Canyon Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.16 Douglas Pass Route

The Douglas Pass Route would extend approximately 178 miles between terminus points in the Basin and a connection with an existing UP rail line near Mack, Colorado. From the Basin, it would travel east to the DPR and would follow the DPR toward Rangely, Colorado. It would then head south along Blue Mountain Road and Colorado State Highway 139 (CO 139) toward Mack via Douglas Pass.

The 2014–2015 UDOT Studies concluded that the Douglas Pass Route would be logistically infeasible to construct due to a maximum grade of approximately 4.0 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Douglas Pass Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Douglas Pass Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.17 Wamsutter Route

The Wamsutter Route would extend generally northwest approximately 248 miles from terminus points in the Basin to a connection with an existing UP rail line near Wamsutter, Wyoming. From the Basin, the route would head east toward and along the existing DPR into Colorado before following US 40 and County Road 143 north. It would follow the Little Snake River from its confluence with the Yampa River to Baggs, Wyoming. It would then head north along Wyoming State Highway 789 (WY 789) and Wamsutter Road to the rail connection near Wamsutter.

The 2014–2015 UDOT Studies concluded that the Wamsutter Route would not meet the purpose and need of the proposed rail line and did not consider the route further. The 2019–2020 Coalition Reports reevaluated the Wamsutter Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Wamsutter Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.18 De Beque Route

The De Beque Route would extend approximately 200 miles from terminus points in the Basin to a connection with an existing UP rail line near De Beque, Colorado. From the Basin, the route would head east toward and along the existing DPR into Colorado before following Piceance Creek, Willow Creek, and West Willow Creek south toward the Book Cliffs. It would then continue south along Tom Creek, Clear Creek Road, County Road 204, and Roan Creek toward the rail connection near De Beque.

The 2014–2015 UDOT Studies concluded that the De Beque Route met the basic engineering criteria in its first-level screening, but in its second-level screening found that the route would likely result in disproportionate impacts on the natural and built environments. The 2019–2020 Coalition Reports reevaluated the De Beque Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the De Beque Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.19 Parachute-Piceance Creek Route

The Parachute-Piceance Creek Route would extend approximately 194 miles from terminus points in the Basin to a connection with an existing UP rail line near Parachute, Colorado. From the Basin, the route would head east toward and along the existing DPR into Colorado before following CO 64 and Piceance Creek. It would then turn south and follow County Road 215 and the existing American Soda Rail Spur toward Parachute.

The 2014–2015 UDOT Studies conducted by UDOT concluded that the Parachute-Piceance Creek Route would be logistically infeasible to construct due to a maximum grade of 2.5 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Parachute-Piceance Creek Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Parachute-Piceance Creek Route is not a reasonable alternative because, in order to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.20 West Rifle Route

As described in the 2014–2015 UDOT Studies, the West Rifle Route would extend east and southeast approximately 202 miles from terminus points in the Basin to a connection with an existing UP rail line near Rifle, Colorado. UDOT concluded that the West Rifle Route would be logistically infeasible to construct due to a ruling grade of 2.5 percent, which is in excess of the criterion of 2.4 percent set in the 2014–2015 UDOT Studies.

In the 2019–2020 Coalition Reports, the Coalition revised the West Rifle Route to include new terminus points within the Basin. The revised West Rifle Route would be approximately 201.6 miles long, of which approximately 136.9 miles would traverse open terrain. The remaining mileage would cross rugged terrain characterized by mountains and deep valleys. Due to the substantial length of the West Rifle Route and the difficult terrain that it would cross, the Coalition concluded that the West Rifle Route would not be economically feasible to construct and operate. For the purpose of comparison, the Coalition estimated that the West Rifle Route would cost approximately 2.67 billion dollars to construct, which is more than twice the estimated construction cost of the least-cost route. Desktop analysis conducted by the Coalition concluded that the West Rifle Route would also cross a greater number of water bodies and would affect a greater area of wetlands than other routes under consideration.

OEA reviewed the available information and concluded that the West Rifle Route is not a reasonable alternative because the construction and maintenance costs associated with the route's substantial length, as well as the extensive regrading, tunneling, and numerous bridges and other structures that would be required, would make the route impractical to construct and operate. OEA also concluded that, like the Craig Route, the West Rifle Route would result in disproportionately significant environmental impacts, including visual, noise, and air quality impacts on DNM and water quality impacts on the Green River related to the proposed crossing of that river.

2.2.2.21 Parachute-RioBlanco Pass Route

The Parachute-RioBlanco Pass Route would extend approximately 174 miles from terminus points in the Basin to a connection with an existing UP rail line near Parachute, Colorado. From the Basin, the route would head east toward and along the existing DPR into Colorado before following CO 64 to Meeker, Colorado. It would then turn south along CO 13 and would follow East Middle Fork Parachute Creek, County Road 215, and the existing American Soda Rail Spur toward the rail connection near Parachute.

The 2014–2015 UDOT Studies concluded that the Parachute-RioBlanco Pass Route would be logistically infeasible to construct due to a maximum grade of 2.5 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Parachute-RioBlanco Pass Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Parachute-RioBlanco Pass Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.22 East Rifle Route

As described in the 2014–2015 UDOT Studies, the East Rifle Route would extend generally east and south approximately 200 miles from terminus points in the Basin to a connection with an existing UP rail line near Rifle, Colorado. UDOT concluded that the East Rifle Route would be logistically infeasible to construct due to a maximum grade of 2.5 percent, which is in excess of the criterion of 2.4 percent set in the 2014–2015 UDOT Studies.

In the 2019–2020 Coalition Reports, the Coalition revised the East Rifle Route to accommodate new terminus points in the Basin. The revised East Rifle Route would be approximately 196.8 miles long, of which approximately 132.1 miles would traverse open terrain. The remaining mileage would cross rugged terrain characterized by mountains and deep valleys. Due to the substantial length of the East Rifle Route and the difficult terrain that it would cross, the Coalition concluded that the route would not be economically feasible to construct and operate. For the purpose of comparison, the Coalition estimated that the East Rifle Route would cost approximately 2.63 billion dollars to construct, which is more than twice the estimated construction cost of the least-cost route. Desktop analysis conducted by the Coalition concluded that the East Rifle Route would also have greater potential for significant environmental impacts relative to other routes under consideration.

OEA reviewed the available information and concluded that the East Rifle Route is not a reasonable alternative because the construction and maintenance costs associated with the route's substantial length, as well as the extensive regrading, tunneling, and numerous bridges and other structures that would be required, would make the route impractical to construct and operate. OEA also concluded that, like the Craig Route, the East Rifle Route would result in disproportionately significant environmental impacts, including visual, noise and air quality impacts on DNM and water quality impacts on the Green River related to the proposed crossing of that river.

2.2.2.23 Newcastle Route

The Newcastle Route would extend approximately 203 miles from terminus points in the Basin to a connection with an existing UP rail line near Newcastle, Colorado. From the Basin, the route would head east toward and along the existing DPR into Colorado before following CO 64 to Meeker, Colorado. It would then head south along Flag Creek and Piceance Creek and would follow West Rifle Creek and County Road 252 past Rifle Gap State Park. It would then head southeast along Elk Creek toward the rail connection near Newcastle.

The 2014–2015 UDOT Studies concluded that the Newcastle Route would be logistically infeasible to construct due to a ruling grade of 2.8 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Newcastle Route and concluded, in the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Newcastle Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.24 Westwater Route

As described in the 2014–2015 UDOT Studies, the Westwater Route would extend generally southward approximately 134 miles from terminus points in the Basin to a connection with an existing UP rail line east of Crescent Junction, Utah. UDOT concluded that the Westwater Route would meet the basic engineering criteria set for its second-level screening and would not result in disproportionate environmental impacts in its third-level screening. In its fourth-level screening, however, more detailed engineering review concluded that the Westwater Route would entail a maximum grade of 2.8 percent, which exceeds the criterion of 2.4 percent maximum grade in the 2014–2015 UDOT Studies.

In the 2019–2020 Coalition Reports, the Coalition revised the Westwater Route to accommodate new terminus points in the Basin. From the Basin, the revised route would follow Willow Creek, Kelly Canyon, and Rock Springs Canyon, then turn southeast and enter a tunnel to Preacher Canyon. It would then follow the Westwater Creek drainage along Book Cliffs Road toward the rail connection east of Crescent Junction. The revised route would extend approximately 159.7 miles, of which 94.9 miles would cross open terrain and the remainder of which would cross rugged terrain characterized by mountains and deep valleys. Due to the substantial length of the Westwater Route and the difficult terrain that it would cross, the Coalition concluded that the Westwater Route would not be economically feasible to construct and operate. For the purpose of comparison, the Coalition estimated that the Westwater Route would cost approximately 2.84 billion dollars to construct, which is well over twice the estimated construction cost of the least-cost route.

OEA reviewed the available information and concluded that the Westwater Route is not a reasonable alternative because the construction and maintenance costs associated with the route's substantial length, as well as the extensive regrading, tunneling, and numerous bridges and other structures that would be required, would make the route impractical to construct and operate.

2.2.2.25 Westwater-Seep Ridge Route

The Westwater-Seep Ridge Route would extend generally south approximately 129 miles from terminus points in the Basin to a connection with an existing UP rail line east of Crescent Junction, Utah. From the Basin, it would follow Bitter Creek Road and Middle Bitter Creek Road toward Sweetwater Canyon. From Sweetwater Canyon, it would follow East Canyon southwest to the Westwater Creek drainage and would then follow Book Cliffs Road toward the rail connection.

The 2014–2015 UDOT Studies concluded that the Westwater-Seep Ridge Route would be logistically infeasible to construct due to a maximum grade of approximately 4.8 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Westwater-Seep Ridge Route and concluded, in the second-level screening, that the route would not be feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Westwater-Seep Ridge Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.26 Cisco Route

The Cisco Route would extend generally southward approximately 141 miles from terminus points in the Basin to a connection with an existing rail line east of Crescent Junction, Utah. From the Basin, the Cisco Route would travel south and southwest through She Canyon and through a tunnel toward the junction of Cottonwood Canyon and Upper Cottonwood Canyon. It would follow Cottonwood Canyon to Cisco Springs Road and then head south toward the rail connection east of Crescent Junction.

The 2014–2015 UDOT Studies concluded that the Cisco Route would be logistically infeasible to construct due to a maximum grade of 4.0 percent, which is in excess of the criterion of 2.4 percent set in those studies. The 2019–2020 Coalition Reports reevaluated the Cisco Route and concluded, in

the second-level screening, that the route would not be logistically feasible to construct and operate while maintaining a maximum grade of 2.5 percent. OEA reviewed the available information and concluded that the Cisco Route is not a reasonable alternative because, to maintain a safe maximum grade, the route would require extensive tunneling, extensive embankment construction on steep slopes, and numerous stream crossings in narrow canyons, all of which would substantially increase the risk of derailment and accidents, the costs associated with construction and operation, and the potential for significant environmental impacts.

2.2.2.27 Avintaquin Canyon Route

The Avintaquin Canyon Route would extend approximately 97 miles from terminus points in the Basin to a connect with an existing UP rail line near Soldier Summit, Utah. From the Basin, it would proceed generally westward along Strawberry River toward Avintaquin Canyon. It would then turn southwesterly and follow Avintaquin Canyon upstream to a summit tunnel through the West Tavaputs Plateau. It would then descend the Roan Cliffs toward the rail connection near Soldier Summit. The Avintaquin Canyon Route was not considered in the 2014–2015 UDOT Studies. The route was first identified in the 2019–2020 Coalition Reports, which concluded that it would not be economically feasible to construct and operate because a significant proportion of the route would traverse rugged terrain characterized by mountains and deep canyons. Construction in such terrain would require many large cut and fills, retaining walls, numerous bridges, multiple large bridges, and tunnels through mountains that are not practical to cross in the open.

Although the Avintaquin Canyon Route would cross extremely challenging terrain, its shorter length relative to some of the other conceptual routes that were assessed initially led OEA to believe that the route could be feasible to construct and operate. Therefore, OEA requested that the Coalition provide more detailed information regarding that route than what was presented in its 2019–2020 Coalition Reports. In its response to OEA's request, the Coalition clarified that the Avintaquin Canyon Route would entail unique engineering and operational challenges that would make the route logistically infeasible.⁶ First, the high altitude of the route would expose the rail line to heavy snowfall that would likely make it inoperable during winter months. Reducing the altitude of the Avintaquin Canyon Route summit to a feasible altitude would require an approximate 11-mile tunnel, a feature that has never before been constructed for a modern, heavy-haul rail line. Additionally, the Avintaquin Canyon Route would require embankments constructed on steep mountain slopes that would be at extreme risk for frequent rockslides, slope failures, and embankment slips. The steep tunnels needed along the Avintaquin Canyon Route would also create the risk of track creep, which occurs when track slides downhill due to the force of uphill-moving trains. According to the Coalition, overcoming track creep on the Avintaquin Canyon Route would be particularly difficult due to the confined space of the tunnels and the relatively thin ballast section, which would have poor adhesion to the solid rock floor of the tunnel beneath the track structure.

OEA has reviewed the available information and concluded that the Avintaquin Canyon Route is not a reasonable alternative because, as described above, it would require impractically extensive regrading and tunneling, as well as requiring logistically impractical engineering features that might not be possible to construct and that, if constructed, would create unacceptable safety risks and maintenance issues during operations.

⁶ See *Coalition's Response to Information Request #4* (Coalition 2019b).

2.2.3 Alternatives Analyzed in the EIS

This section describes the route details and any anticipated permits or amendments needed from other agencies for the three Action Alternatives and No-Action Alternative. The Coalition's voluntary mitigation, found in Chapter 4, *Mitigation*, includes route location and design revisions to minimize or avoid potential impacts. All Action Alternatives would connect two terminus points near Myton, Utah and Leland Bench, Utah to an existing rail line near Kyune, Utah. The following subsections include additional details concerning project features and an overview map for each alternative showing those features. Appendix A, *Action Alternatives Supporting Information*, includes detailed map sets for each alternative illustrating project features and tables showing the same information in tabular form. Chapter 3, *Affected Environment and Environmental Consequences*, discusses specific features relevant to certain resources.

2.2.3.1 Indian Canyon Alternative

The Indian Canyon Alternative would extend approximately 81 miles from two terminus points in the Basin near Myton and Leland Bench to a connection with an existing UP rail line near Kyune (Figure 2-1). Starting at Leland Bench, approximately 9.5 miles south of Fort Duchesne, Utah, the route would proceed westward, past the South Myton Bench area, until intersecting Indian Canyon approximately 2 miles south of Duchesne, Utah. After entering Indian Canyon, the route would turn southwest and follow Indian Creek upstream toward its headwaters below Indian Creek Pass, paralleling U.S. Highway 191 (US 191) for approximately 21 miles. The Indian Canyon Alternative would use a summit tunnel to pass through the West Tavaputs Plateau near Indian Creek Pass on US 191. After emerging from the tunnel, it would descend the Roan Cliffs to reach Emma Park, an open grassy area at the base of the Roan Cliffs. The route would then run westward through Emma Park where it would split into a westbound and eastbound wye⁷ configuration that would connect to the UP Provo Subdivision near the railroad timetable station at Kyune. In addition to the summit tunnel, the Indian Canyon Alternative would include two additional tunnels.

The 2014–2015 UDOT Studies concluded that this route would meet the project's purpose and need, would be feasible to construct in terms of engineering and economics, and would result in fewer significant impacts on the natural and built environment than other conceptual routes. The 2019–2020 Coalition Reports also concluded that the route would be feasible to construct and operate and would not result in disproportionate environmental impacts relative to other routes. Among all of the conceptual routes that have been considered for the proposed rail line, the Indian Canyon Alternative would be the shortest in length at approximately 81 miles and would entail the lowest estimated construction cost at approximately 1.29 billion dollars. Because it would be logistically and economically feasible to construct and operate and because it would not present unreasonable challenges related to engineering, economics, or disproportionately significant environmental impacts, OEA concluded that the Indian Canyon Alternative is a reasonable alternative and has analyzed it in detail in this [Draft EIS](#).

The Indian Canyon Alternative would cross 12 miles of National Forest System land within Ashley National Forest. If the Board were to authorize this alternative, the Coalition would have to seek U.S. Forest Service (Forest Service) approval for permitting the rail line right-of-way, which could include amending the Ashley Forest Plan with a project-specific amendment in the areas of visual

⁷ The term *wye* refers to the Y-like formation that is created at the point where train tracks branch off the mainline to continue in different directions.

quality and scenery management, pursuant to the requirements of the 2012 Planning Rule (36 C.F.R. Part 219). [With the exception of the project-specific amendment for visual quality and scenery management, the Indian Canyon Alternative would be consistent with the Ashley Forest Plan.](#) The project-specific amendment would include the following language:

The plan amendment adds the following to the Forest Plan Standard and Guideline for Objective 9 for Recreation under IV. Forest Management Direction, C. Goals, Objectives, Standards and Guidelines by Management Area (Forest Plan, page IV-19): This standard and guideline does not apply to the Uinta Basin Railway Project (ROD, [date]).

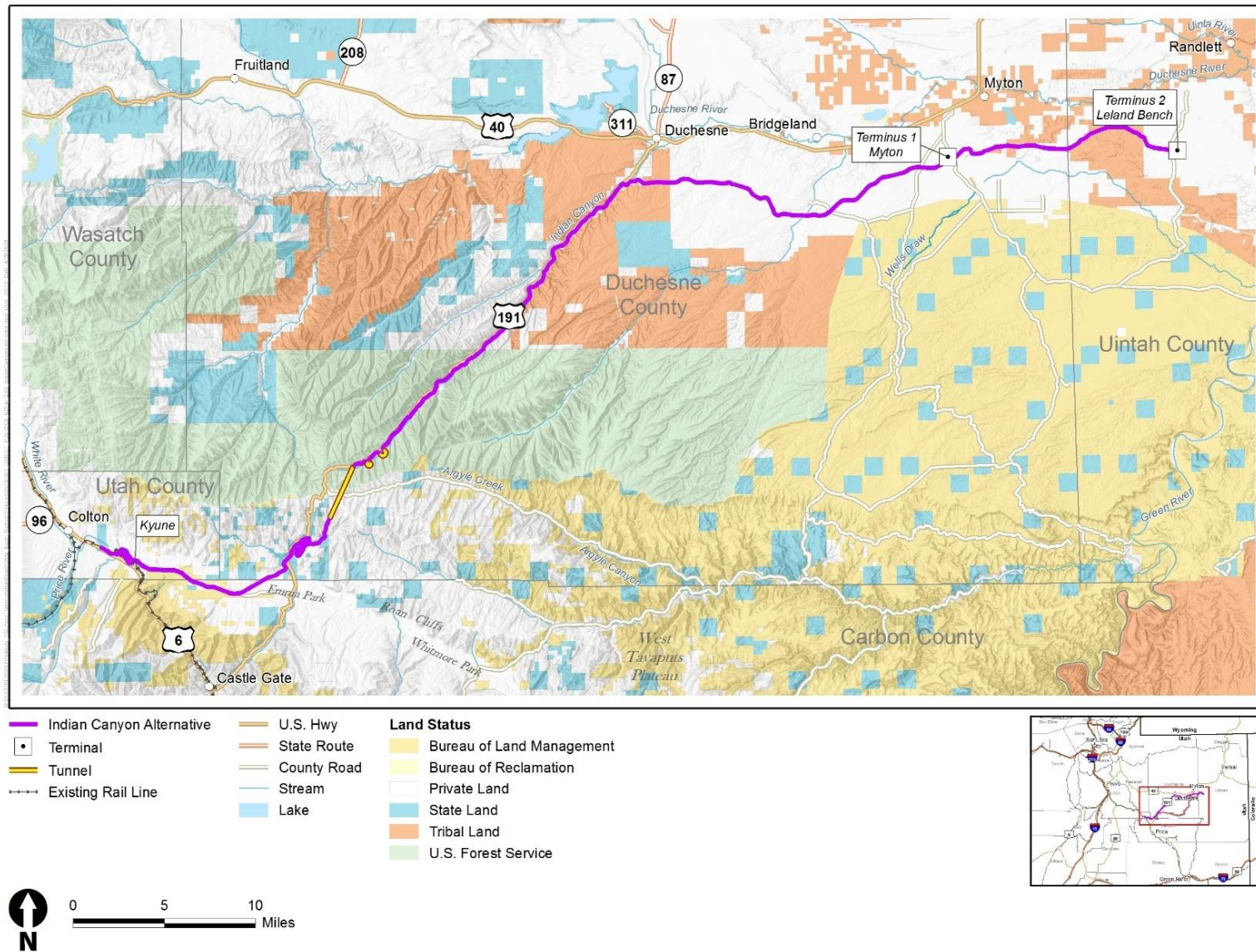
Because the Indian Canyon Alternative would cross through [inventoried](#) roadless areas in Ashley National Forest, review and approval by the Regional Forester would have to be completed to ensure consistency with the 2001 Roadless Area Conservation Rule (36 C.F.R., Part 294, Subparts A and B).

The Indian Canyon Alternative would also cross 2.5 miles of BLM land administered by the BLM Vernal Field Office, Price Field Office, and Salt Lake Field Office. Therefore, if the Board were to authorize this alternative, the Coalition would have to seek and obtain a right-of-way permit across BLM-administered public lands, pursuant to 43 C.F.R. Part 2800, before beginning construction. The issuance of a right-of-way would also be subject to the requirements of applicable BLM RMPs, including the Vernal Field Office RMP, Price Field Office RMP, and Pony Express RMP. As proposed, the Indian Canyon Alternative would not be in compliance with greater sage-grouse noise thresholds in the Price Field Office RMP and Pony Express RMP, as amended by the Utah Greater Sage-Grouse Approved RMP Amendment/Record of Decision (2015). [In addition, the Indian Canyon Alternative would exceed the ground disturbance cap for greater sage-grouse in the Price Field Office RMP and Pony Express RMP.](#) BLM would need to amend these plans to issue a right-of-way grant for the Indian Canyon Alternative.

The Indian Canyon Alternative would also cross 8.1 miles of Tribal trust lands in the Uintah and Ouray Reservation. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a consent resolution from the Ute Indian Tribe and a grant of easement for right-of-way or leases, if necessary, from the Bureau of Indian Affairs (BIA) before beginning construction.

In addition to Forest Service, BLM-administered, and Tribal trust lands, the Indian Canyon Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands.

Figure 2-1. Indian Canyon Alternative



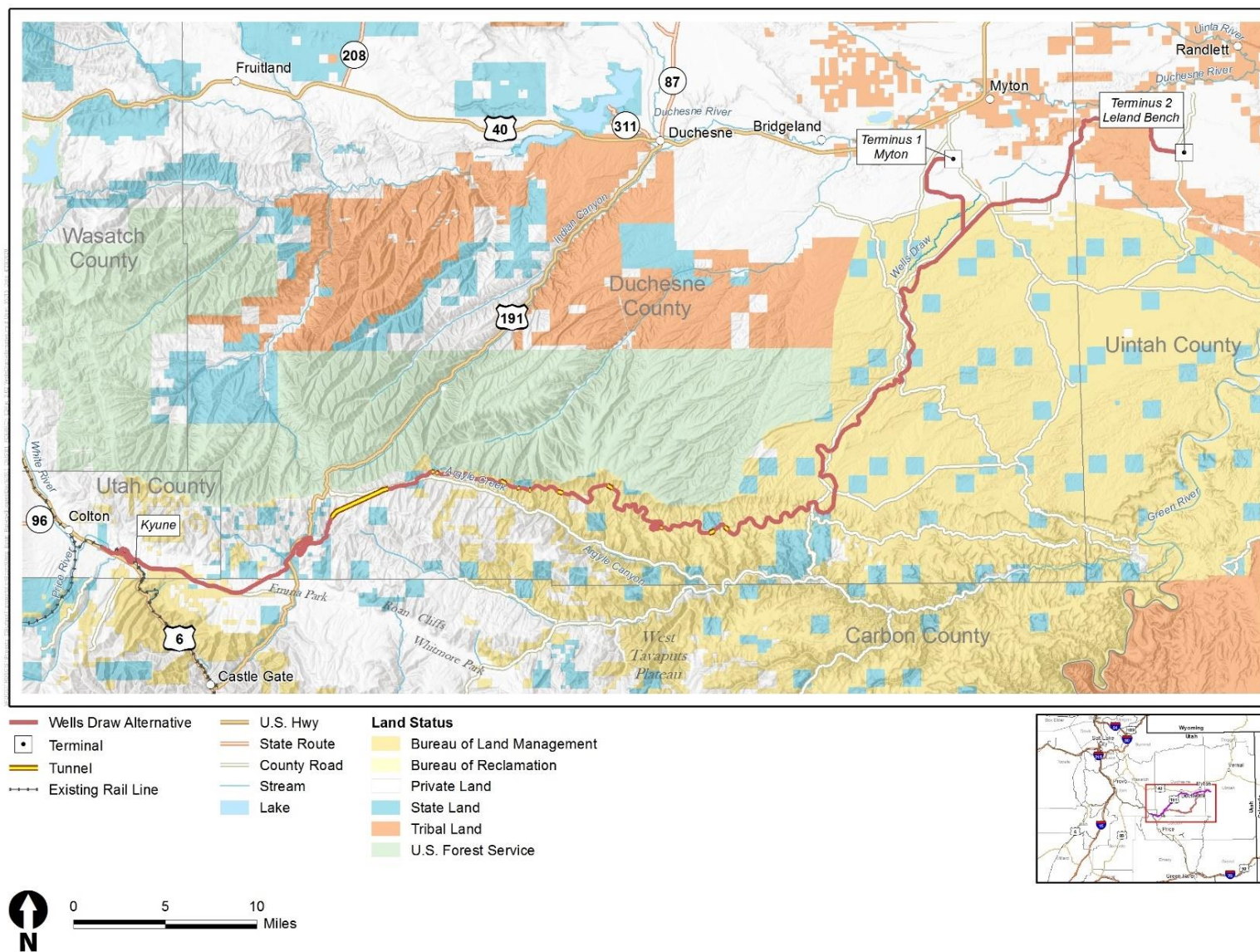
2.2.3.2 Wells Draw Alternative

The Wells Draw Alternative would extend approximately 103 miles from two terminus points in the Basin near Myton and Leland Bench to an existing UP rail line near Kyune (Figure 2-2). The lines from the two terminus points would meet at a junction approximately 6.5 miles south of South Myton Bench. From the junction, the Wells Draw Alternative would run southward, generally following Wells Draw toward its headwaters. After reaching the headwaters of Wells Draw, the alternative would turn westward and enter Argyle Canyon. It would remain on the north wall of Argyle Canyon for approximately 25 miles, eventually reaching the floor of the canyon near the headwaters of Argyle Creek. The Wells Draw Alternative would then enter a summit tunnel through the West Tavaputs Plateau. The location of the summit tunnel's west portal would be similar to the Indian Canyon's summit tunnel west portal, but its east portal would be located in the upper reaches of Argyle Canyon instead of the upper reaches of Indian Canyon. After emerging from the tunnel, the Wells Draw Alternative would descend the Roan Cliffs to reach Emma Park. It would then run westward through Emma Park where it would split into a westbound and eastbound wye configuration that would connect to the UP Provo Subdivision near Kyune. In addition to the summit tunnel, the Wells Draw Alternative would include 12 additional tunnels.

The Wells Draw Alternative was not considered in the 2014–2015 UDOT Studies. The Coalition first identified the route prior to issuing the 2019–2020 Coalition Reports, which concluded that the Wells Draw Alternative would be technically and economically feasible to construct and operate. The Wells Draw Alternative would traverse primarily moderate terrain, characterized by foothills and incised river valleys, as well as some rugged terrain comprising mountains and deep valleys. Construction of this alternative would require numerous bridges, many large areas of cut-and-fill, and 13 tunnels of varying length. The Wells Draw Alternative would, therefore, have a much higher construction cost than the Indian Canyon Alternative at 2.14 billion dollars. However, the available information indicates that the alternative would not require features that would present unreasonable engineering challenges or significant safety or operational risks. Because it would be logistically and economically feasible to construct and operate and because it would not present unreasonable challenges related to engineering, economics, or disproportionately significant environmental impacts, OEA concluded that the Wells Draw Alternative is a reasonable alternative and has analyzed it in detail in this [Draft EIS](#).

The Wells Draw Alternative would cross 57.2 miles of land managed by the BLM Vernal Field Office, Price Field Office, and Salt Lake Field Office. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a right-of-way permit across BLM-administered lands, pursuant to 43 C.F.R. Part 2800, before beginning construction. The issuance of a right-of-way would be subject to the requirements of the BLM Vernal Field Office RMP, Price Field Office RMP, and Pony Express RMP. As proposed, the Wells Draw Alternative would not be in compliance with greater sage-grouse noise thresholds in the Price Field Office RMP and Pony Express RMP, as amended by the Utah Greater Sage-Grouse Approved RMP Amendment/Record of Decision (2015). [In addition, the Wells Draw Alternative would exceed the ground disturbance cap for greater sage-grouse in the Price Field Office RMP and Pony Express RMP.](#) BLM would need to amend these plans in order to issue a right-of-way grant. BLM may also need to amend the Vernal Field Office RMP based on where the Wells Draw Alternative crosses BLM Visual Resource Management Class II land and the Lears Canyon Area of Critical Environmental Concern.

Figure 2-2. Wells Draw Alternative



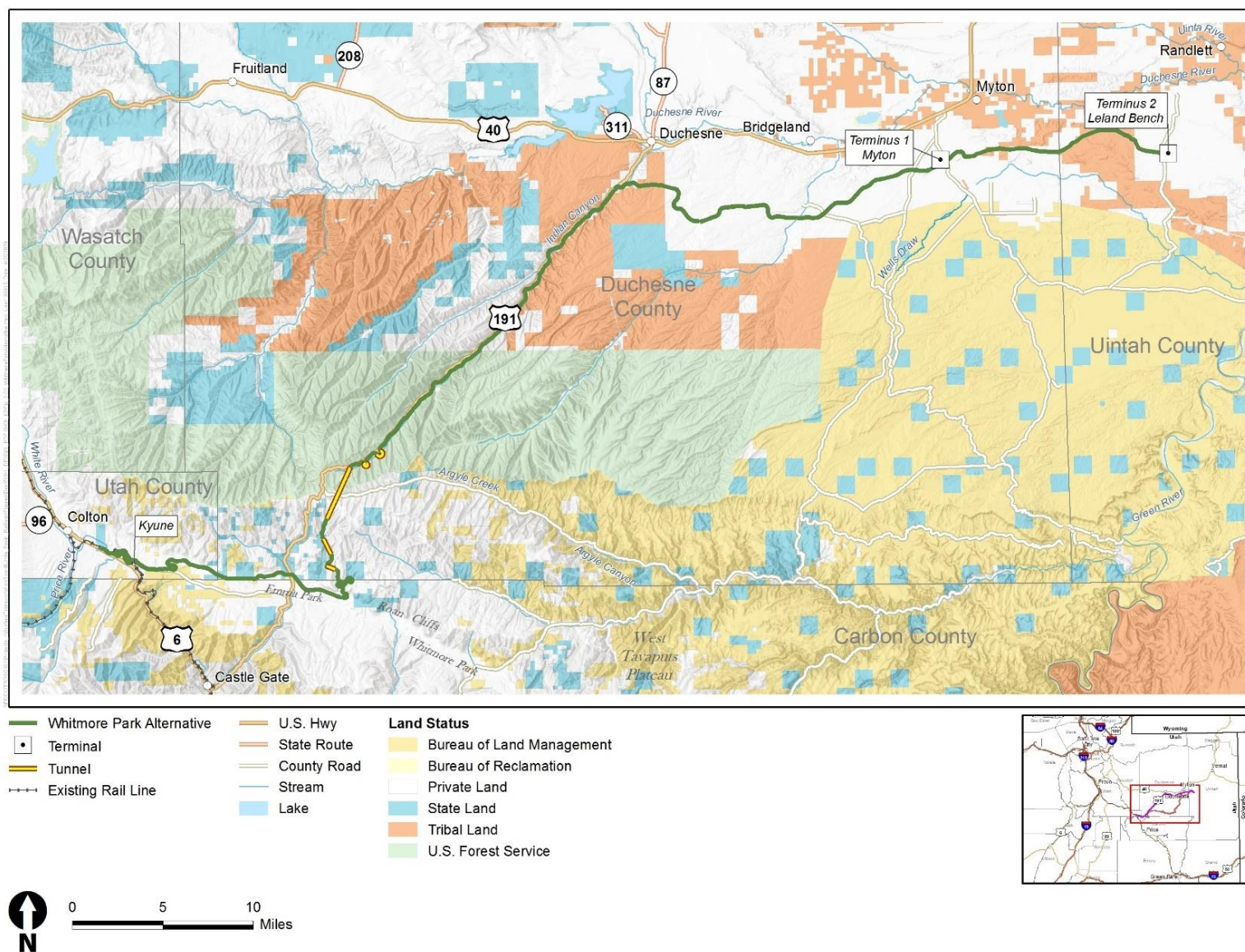
In addition to BLM-administered land, the Wells Draw Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands. The Wells Draw Alternative would not cross Forest Service land or Tribal trust lands. [Although the Wells Draw Alternative would not cross Tribal trust lands, the Wells Draw Alternative would affect lands and resources under the regulatory jurisdiction of the Ute Indian Tribe and likely cross Indian country lands within tribal jurisdiction as defined in Ute Indian Tribe v. Utah, 773 F.2d 1087 \(10th Cir. 1985\) and Ute Indian Tribe of the Uintah and Ouray Reservation v. State of Utah, 114 F.3d 1513 \(10th Cir. 1997\).](#)

2.2.3.3 Whitmore Park Alternative (Coalition's Preferred Alternative)

The Whitmore Park Alternative would extend approximately 88 miles from terminus points in the Basin near Myton and Leland Bench to an existing UP rail line near Kyune (Figure 2-3). This alternative would overlap for much of its length with the Indian Canyon Alternative. Approximately 23 miles west of the terminus point near Leland Bench, the Whitmore Park Alternative would diverge from the Indian Canyon Alternative, heading south to avoid the residential Mini Ranches area near Duchesne, Utah. It would then continue west to Indian Canyon and turn southwest to follow Indian Creek, paralleling US 191. Like the Indian Canyon Alternative, the Whitmore Park Alternative would use a summit tunnel to pass through the West Tavaputs Plateau near Indian Creek Pass on US 191. After emerging from the tunnel, the Whitmore Park Alternative would again diverge from the Indian Canyon Alternative to head south and southeast on its descent from the Roan Cliffs. After reaching Emma Park, it would follow Whitmore Park Road westward, cross US 191, and continue west along Quarry Road and Emma Park Road where it would split into a westbound and eastbound wye configuration that would connect to the UP Provo Subdivision near Kyune. In addition to the summit tunnel, the Whitmore Park Alternative would include four additional tunnels.

The Whitmore Park Alternative was not considered in the 2014–2015 UDOT Studies or in the 2019–2020 Coalition Reports. The Coalition developed the alternative during the scoping process in response to comments that OEA received from federal, state, and local agencies; tribes; other affected stakeholders; and the public, as well as additional outreach and consultation that the Coalition conducted. According to the Coalition, the Whitmore Park Alternative was developed specifically to avoid or minimize impacts on the natural and built environments, including residences in the Mini Ranches area near Duchesne and known greater sage-grouse leks in the Carbon Sage-Grouse Management Area. Although it would entail a construction cost of approximately 1.35 billion dollars, which is approximately 60 million dollars higher than the Indian Canyon Alternative, the Coalition has identified the Whitmore Park Alternative as its preferred alternative.

Figure 2-3. Whitmore Park Alternative



The Whitmore Park Alternative would cross 12 miles of Forest Service land within Ashley National Forest. If the Board were to authorize this alternative, the Coalition would have to seek Forest Service approval for permitting the rail line right-of-way, which could include amending the Ashley ~~National~~ Forest Plan with a project-specific amendment in the areas of visual quality and scenery management, pursuant to the requirements of the 2012 Planning Rule. [With the exception of the project-specific amendment for visual quality and scenery management, the Whitmore Park Alternative would be consistent with the Ashley Forest Plan.](#) The project-specific amendment would include the following language:

The plan amendment adds the following to the Forest Plan Standard and Guideline for Objective 9 for Recreation under IV. Forest Management Direction, C. Goals, Objectives, Standards and Guidelines by Management Area (Forest Plan, page IV-19): This standard and guideline does not apply to the Uinta Basin Railway Project (ROD, [date]).

Because the Whitmore Park Alternative would cross through [inventoried](#) roadless areas in Ashley National Forest, review and approval by the Regional Forester would have to be completed to ensure consistency with the 2001 Roadless Area Conservation Rule.

The Whitmore Park Alternative would also cross 8.1 miles of Tribal trust lands in the Uintah and Ouray Reservation. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a consent resolution from the Ute Indian Tribe and a grant of easement for right-of-way or leases, if necessary, from BIA before beginning construction.

In addition to Forest Service and Tribal trust lands, the Whitmore Park Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands. The Whitmore Park Alternative would not cross BLM-administered lands.

2.2.3.4 No-Action Alternative

Under the No-Action Alternative the Board would not license the Coalition to construct and operate the proposed rail line. The Coalition would not construct the proposed rail line and the quality of the human environment would not change from current conditions.

2.3 Construction and Design Features

This section describes the Coalition's plans for constructing the proposed rail line, including information pertaining to the rail line, temporary, and project footprints; railbed and track construction; materials for rail line construction; construction staging areas; staffing and worker housing; bridges, culverts, and other surface water crossings; grade crossings; road relocations; and facilities that the Coalition would construct as part of the proposed rail line. This section also describes the Coalition's anticipated construction schedule if the Board were to authorize the proposed rail line. Figure 2-1 through Figure 2-3 include project construction and features location information for the Indian Canyon Alternative, Wells Draw Alternative, and Whitmore Park Alternative, respectively. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding project features, as well as detailed map sets for each Action Alternative.

2.3.1 Rail Line, Temporary, and Project Footprints

OEA has defined the following terms to describe the areas where construction and operation of the rail line would occur.

- **Rail line footprint.** The rail line footprint includes the area of the railbed, as well as the full width of the area cleared and cut or filled. The rail line footprint would also include other physical structures installed as part of the proposed rail line, such as fence lines, communications towers, siding tracks, relocated roads, and power distribution lines. The rail line footprint is the area where rail line operations and maintenance would occur. The area would be permanently disturbed.
- **Temporary footprint.** The temporary footprint is the area that would be temporarily disturbed during construction, including areas for temporary material laydown, staging, and logistics. The temporary footprint would be reclaimed and revegetated following construction.
- **Project footprint.** The project footprint is the combined area of the rail line footprint and temporary footprint, both of which would be disturbed during construction, comprising where construction and operations of the proposed rail line would occur.

The width of the rail line footprint would vary depending on site-specific conditions, such as topography, soil slope stability, and other geotechnical conditions. Table 2-1 provides the length and area of the rail line, temporary, and project footprints for each Action Alternative. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding the footprints.

Table 2-1. Length and Footprints by Action Alternative

Action Alternative	Length (miles)	Rail Line Footprint (acres)	Temporary Footprint (acres)	Project Footprint (acres)
Indian Canyon	80.5	1,340.5	2,467.8	3,808.2
Wells Draw	103.3	2,560.1	5,095.2	7,655.3
Whitmore Park	87.7	1,430.6	3,087.7	4,518.3

The Coalition would either purchase the land or obtain easements for the entire project footprint. However, only the rail line footprint would be permanently cleared of vegetation for construction and operation of the proposed rail line. The Coalition might not need to use the entire project footprint after construction. The Coalition has voluntarily committed to mitigation that would require it to limit ground disturbance to only the areas necessary for project-related construction and to reclaim disturbed areas when construction is completed (refer to voluntary mitigation VM-16 and VM-22 in Chapter 4, *Mitigation*).

All Action Alternatives would require constructing temporary and permanent access roads. The Coalition would construct temporary access roads that would provide access to the rail embankment, tunnel portals, and bridge and drainage structure locations during construction. The Coalition would also construct several permanent access roads to provide access to rail sidings and long tunnels during rail operations. OEA expects that temporary and permanent access roads would be 13 feet wide, on average, and would connect to nearest existing roadways to minimize the length of the access roads. Figure 2-4 presents example cross-sections of the rail line footprint.

[illegible]

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2.3.2 Railbed and Track Construction

Under each Action Alternative, the width of the railbed would extend approximately 10 to 20 feet from the centerline to the edge of the subballast. This distance would vary in cut-and-fill locations where ditches could be required. The Coalition would construct the track on top of approximately 12 inches of subballast material and 8 inches of ballast. Timber, steel, or concrete ties would support the continuously welded steel rail. The Coalition could use hot-mix asphalt under the ties if the final design indicates that this is practical. OEA expects that the Coalition would design the track to accommodate loading requirements and to support a gross weight of 315,000 pounds per rail car and 432,000 pounds per locomotive.⁸

2.3.3 Rail Line Construction Equipment and Methods

Construction of the proposed rail line would involve a variety of construction methods and equipment. Bull dozers, front-end loaders, and dump trucks would be used to create the appropriate corridor and grade. Cranes may be needed to construct bridges over roads and surface waters. Mining and potentially blasting methods would be used to construct tunnels. Rail would be laid and welded by track welding machine or crews where necessary.

2.3.4 Materials for Rail Line Construction

The Coalition would use existing, permanent quarries located in Carbon, Duchesne, Uintah, and Utah Counties to obtain and stockpile aggregate and rock materials. Trucks would deliver the materials to the rail line using existing roadways and temporary and permanent access roads. The Coalition anticipates obtaining concrete aggregate and subballast material from existing UDOT-certified quarries and ballast material from an existing rail-served quarry near Milford, Utah. If that source of ballast material were unavailable, the Coalition would obtain ballast material from existing rail-served quarries near Granite Canyon, Wyoming, and Carr, Colorado. The Coalition does not anticipate needing or developing new quarry sources. If the Coalition were to identify the need for additional sources during the final design phase of the proposed rail line, the Coalition would develop those sources in conformance with applicable local and state land use and permitting regulations and applicable UDOT specifications.

The Coalition intends to balance cut-and-fill material so that fill and spoil sites would not be required. During construction, subballast would be transported via truck, and ballast would be delivered by rail directly to its final location. Staging for subballast and ballast material would occur at the quarries from which those materials were obtained. The Coalition intends to obtain water for compaction, dust control, and concrete work from existing water right holders and would not pursue any new water rights. The Coalition would identify the specific existing water rights for construction during the final design phase based on discussions with current water right holders, timing of construction activities and seasonal availability, location of the water right point of diversion, and the type of water right diversion (e.g., well, surface water). The sources for water

⁸ The estimated maximum weight of locomotives used by the proposed rail line would range from approximately 380,000 to 432,000 pounds. The typical weight of loaded crude oil rail cars operating over the proposed rail line is expected to be 143 tons, or 286,000 pounds, per car.

used during construction may include groundwater, surface water, potable water, or reclaimed and treated wastewater.

2.3.5 Construction Staging Areas

During construction of the proposed rail line, the Coalition intends to locate all temporary staging areas within the project footprint or in existing permanent industrial sites permitted for construction uses. To receive construction materials by rail, the Coalition would use existing permanent rail-to-truck transload facilities located in Salt Lake City, Ogden, Provo, Helper, Price, and other locations in Utah, and would transfer the materials to trucks for final delivery to the project footprint. The Coalition would establish temporary material laydown, staging, and logistics areas within the project footprint at bridge locations, tunnel portals, roadway crossings, and other locations.

2.3.6 Staffing and Worker Housing

The average annual workforce during construction of all three Action Alternatives would include approximately 1,000 individuals, with peak employment of approximately 1,500 individuals. The Coalition expects that peak employment would occur between May 1 and October 30, during each year of construction. Most construction personnel would reside in their own personal residences or in existing [recreational vehicle parks](#), commercial hotels and motels, but dedicated construction camps would be needed for some staff. Specifically, the Indian Canyon Alternative and Whitmore Park Alternative would each require one temporary construction camp for 30 to 40 people, and the Wells Draw Alternative would require two construction camps for 30 to 40 people and another construction camp for 200 people (Table 2-2). Appendix A, *Action Alternatives Supporting Information*, identifies the proposed location of the temporary housing camps.

Table 2-2. Temporary Housing Camps for Construction Staff

Action Alternative	Capacity (people)	Type of Construction	Size (acres)	Location (milepost)
Indian Canyon	30–40	Tunnel	5	35
Wells Draw	30–40	Tunnel	5	23
	30–40	Tunnel	5	36
	200	Embankments and bridges	8.5	57
Whitmore Park	30–40	Tunnel	5	40

2.3.7 Bridges, Culverts, and Stream Realignment

The proposed rail line and associated access roads and road relocations would require bridges and culverts to cross streams, rivers, and drainages, as well as existing roadways. Table 2-3 shows the number of bridges and culverts for each Action Alternative.

Table 2-3. Bridges and Culverts

Action Alternative	Rail Bridges	Road Bridges	Culverts
Indian Canyon	31	2	372
Wells Draw	33	3	496
Whitmore Park	30	1	423

Notes:

Bridges include Precast Prestressed Concrete Double Cell Box Beam Span, Rolled Steel Beam Span with Steel Pan Deck, Structural Steel Plate Arch, and other bridge types to be determined during final design.

Construction of the proposed rail line would require realignments of stream segments to accommodate permanent project features, including portions of the rail bed and areas of cut and fill. Table 2-4 displays the number and length of streams [filled at](#) realignments by Action Alternative.

Table 2-4. Stream Realignments per Action Alternative

Action Alternative	Number of Realignments	Total Length of Streams Filled at Realignments (miles)
Indian Canyon	59	3.9
Wells Draw	17	1.4
Whitmore Park	55	3.8

Appendix A, *Action Alternatives Supporting Information*, includes location information for all bridges, culverts, and stream realignments.

2.3.8 Tunnels

The proposed rail line would require tunnels to traverse the mountainous terrain surrounding the Basin. Drilling and blasting (i.e., “mine” construction methods) may be used in certain locations, depending on the length of the tunnel and the specific geological features at the tunnel locations. Tunnels over 1 mile long would likely require rock stabilization and ventilation features. Shorter tunnels may not require those features, depending on the specific geological features at the tunnel locations. The Coalition may install mechanical ventilation, such as jet fans mounted on tunnel walls or ceilings, depending on the length and configuration of the tunnel. Table 2-5 displays the number of tunnels and total length of tunnels by Action Alternative. Appendix A, *Action Alternatives Supporting Information*, provides design details for the proposed tunnels for each Action Alternative, including milepost references, length of tunnels, and ownership of land crossed.

Table 2-5. Tunnels

Action Alternative	Number of Tunnels	Total Length of Tunnels (miles)
Indian Canyon	3	4.3
Wells Draw	13	5.6
Whitmore Park	5	5.7

2.3.9 Grade Crossings

Table 2-6 shows the number of planned public and private road crossings for each Action Alternative. Paved public roadway crossings, if not grade-separated, would be equipped with active warning devices (bells, flashers, and gates) and constant warning time devices. Gravel and

unsurfaced public roadway crossings and all private roadway crossings, if not grade-separated, would be equipped with passive warning devices (stop signs and crossbucks). The Coalition would design grade-crossing warning devices to comply with the *Manual on Uniform Traffic Control Devices* (FHWA 2009) and applicable safety regulations. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding grade crossings, including the number of public and private roadway crossings.

Table 2-6. Number of Road Crossings per Action Alternative

Action Alternative	At-Grade	Grade-Separated	Total
Indian Canyon	53	17	70
Wells Draw	61	29	90
Whitmore Park	66	14	80

2.3.10 Road Relocations

Construction of the proposed rail line would result in the relocation of existing public and private roads. Table 2-7 shows the number of road relocations and the total length of relocations. Chapter 3, Section 3.11, *Land Use and Recreation*, provides more detailed information on road relocations and potentially disturbed acres of land. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding road relocations.

Table 2-7. Road Relocations per Action Alternative

Action Alternative	Number of Relocations	Total Length of Relocations (miles)
Indian Canyon	52	11.8
Wells Draw	65	13.7
Whitmore Park	71	13.8

2.3.11 Associated Facilities

2.3.11.1 Support Facilities

The Coalition does not anticipate constructing or operating stations along the proposed rail line. The Coalition expects that UP and BNSF Railway Company would conduct run-through operations on the proposed rail line and does not intend to construct locomotive repair shops, rail car repair shops, marshalling yards, or storage yards as part of the proposed rail line. Shippers could conduct mechanical inspections and repairs at potential shipper-owned facilities.

2.3.11.2 Siding Tracks and Set-Out Tracks

The proposed rail line would consist of a single main track with sidings to enable trains to meet and/or pass. Siding tracks would add 15 to 20 feet to the width of the track structure. Table 2-8 shows the estimated numbers and lengths of sidings for each Action Alternative. The Coalition would determine the exact locations of siding tracks during final design. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding siding and set-out tracks.

Table 2-8. Siding Tracks and Set-Out Tracks

Action Alternative	Number of Sidings	Total Length of Sidings (miles)	Range of Sidings (miles)
Indian Canyon	6	12.4	1.65–3.69
Wells Draw	3	5.2	1.64–1.85
Whitmore Park	9	18.0	1.65–3.69

2.3.11.3 Distribution Lines and Power

Power distribution lines would be needed for some signals, communications, and safety equipment. The Coalition would determine the exact locations of power distribution lines during detailed design following the conclusion of the Board's environmental review process. OEA anticipates that any needed power distribution lines would be constructed within the rail line footprint, and would connect to existing lines where there are connections adjacent to the rail line footprint. In more remote or inaccessible locations, OEA anticipates that the Coalition would use solar-powered equipment. This would include any power needed for the communications towers and remote grade crossings requiring active warning devices.

2.3.11.4 Communications Towers

The proposed rail line would require the construction of permanent communications towers. Each tower site would be approximately 0.5 acre in area and approximately 120 feet high, though the exact height would depend on final design details. Each Action Alternative would require the construction of four communications towers. The Coalition would construct permanent access roads to provide access to the communications towers. These access roadways would be approximately 13 feet wide and located within the rail line footprint. Appendix A, *Action Alternatives Supporting Information*, provides additional information regarding the location of the communications towers and access roads.

2.3.12 Construction Schedule

The Coalition anticipates that construction of the Indian Canyon Alternative or the Whitmore Park Alternative would take approximately 2 years, but this time frame could range from 20 to 28 months depending on weather conditions. The Coalition expects that construction of the Wells Draw Alternative would take approximately 3 years, but could range from 32 to 48 months depending on weather conditions. The construction season would be different for the different components of the rail line.

Construction of the following features would occur year-round (12 months per year).

- Tunnels
- Bridges
- Signal and communications systems

Construction of the following components would be limited to an 8-month construction season each year, beginning in mid-April and ending in mid-November.

- Embankments (cuts and fills)
- Culverts

- Retaining walls
- Roadways and roadway crossings
- Track
- Fencing

2.4 Operations

Following construction of the proposed rail line, RGPC would operate the proposed rail line. The Coalition anticipates that shippers would primarily use the proposed rail line to transport crude oil using trains composed of 110 tank cars each, on average. The Coalition also expects that shippers could transport frac sand on the proposed rail line using frac sand trains composed of 110 cars each, on average. It is also possible that shippers would transport other commodities in rail cars that would be added to the oil trains or the frac sand trains. Each oil train and each frac sand train would be powered by approximately eight 4,300- to 4,400-horsepower locomotives.

Trains on the proposed rail line would operate at speeds allowable for Federal Railroad Administration (FRA) Class 3 tracks. The Coalition anticipates an average train speed of between 10 and 20 miles per hour. The maximum speed would not exceed the safe operating speed on FRA Class 3 tracks, which is 40 miles per hour for freight rail. Trains on the proposed rail line would operate 365 days per year, 24 hours per day, as permitted by weather conditions.

2.4.1 Rail Traffic

Depending on future market conditions, the Coalition estimates that between 672 and 1,809 loaded oil trains would leave the Basin per year using the proposed rail line. An equal number of empty oil trains would enter the Basin each year on the proposed rail line. These estimates correspond to a daily average of 3.68 to 9.92 loaded and empty oil trains on the proposed rail line. Each loaded oil train would include, on average, 110 tank cars and each tank car would contain, on average, approximately 642 barrels of crude oil. Therefore, the total volume of oil that would be transported on the proposed rail line would range from 130,000 to 350,000 barrels per day, on average. The actual volumes of oil that would move over the proposed rail line would depend on the demand for crude oil from the Basin, which is determined by global crude oil prices and capacity at oil refineries.

In addition, and also depending on future market conditions, the Coalition estimates that between 0 and 110 loaded frac sand trains would enter the Basin each year using the proposed rail line, to support oil mining in the Basin. An equal number of empty frac sand trains would leave the Basin each year on the proposed rail line. These estimates correspond to a daily average of 0 to 0.6 loaded and empty frac sand trains on the proposed rail line.

Including loaded and empty frac sand trains and unloaded and empty oil trains, the Coalition estimates that total rail traffic on the proposed rail line would range from 3.68 to 10.52 trains per day, on average. Shippers could also use the proposed rail line to transport other commodities, but the Coalition does not anticipate that the volume of those commodities would be large enough to support dedicated trains. Therefore, other commodities would be shipped in manifest rail cars attached to the oil trains and frac sand trains. The Coalition estimates that the number of manifest rail cars added to the oil trains and frac sand trains would range from 24 carloads per day to 36 carloads per day, on average, including loaded and empty rail cars.

Because the rail traffic would depend on future market conditions that the Board does not control and that OEA cannot precisely predict, OEA defined two reasonably foreseeable scenarios for future traffic levels for the purposes of this [Draft EIS](#). The two scenarios correspond to the lowest and highest estimated traffic estimates. Under the high rail traffic scenario, 10.52 trains would move on the proposed rail line each day, on average. Under the low rail traffic scenario, 3.68 trains would move on the proposed rail line each day, on average.

2.4.2 Maintenance

OEA expects that the Coalition would construct the proposed rail line using new materials, which would initially require a minimal amount of maintenance. Maintenance activities on the tracks would include rail surfacing, ballast cleaning and tamping, and rail grinding. Other maintenance activities would include maintaining rail sensors; lubricating rails; replacing rail, ties, and ballast; and inspecting track. In addition, any tunnels would need regular inspections and maintenance.

2.4.3 Staffing

Operations and maintenance employment requirements would be similar for the Indian Canyon Alternative and Whitmore Park Alternative. Due to its longer length and the more difficult topography that it would cross, the Wells Draw Alternative would require a greater number of staff for operations and maintenance. Staffing requirements would also depend on the train traffic volume. Table 2-9 lists the operations and maintenance staffing requirements for each Action Alternative for the high rail traffic scenario and the low rail traffic scenario.

Table 2-9. Operations and Maintenance Staffing Requirements

Action Alternative	High Rail Traffic Scenario (10.52 trains per day)	Low Rail Traffic Scenario (3.68 trains per day)
	Employees	Employees
Indian Canyon	100	50
Wells Draw	120	65
Whitmore Park	100	50

Skilled labor and unskilled labor positions would include the following:

- Railroad operations employees, such as engineers, conductors, foremen, and train dispatchers.
- Maintenance-of-way employees, such as track maintainers, bridge maintainers, machine operators, truck drivers, signal and communications systems maintainers, and laborers.
- Mechanical employees, such as rail car and locomotive maintainers and inspectors (i.e., light repairs and replacement of consumables such as brake shoes) and laborers.

Management labor would consist of the following:

- Operations management, which would include supervision of train crews and direction of day-to-day operations.
- Engineering management, which would include supervision of track, bridge, and signal maintainers, and direction of day-to-day fixed infrastructure maintenance.

- Mechanical management, which would include supervision of locomotive and rail car maintainers and inspectors.
- General management and general office staff.

Table 2-10 shows the estimated percentages of the total operations and maintenance workforce by job type.

Table 2-10. Estimated Percentages of Total Operations and Maintenance Workforce by Job Type

Job Type	High Rail Traffic Scenario (%)	Low Rail Traffic Scenario (%)
Operations	60	45
Maintenance of Way	25	35
Mechanical	5	5
Management	10	15

OEA expects that the relative percentage of operations employees would be higher under the high rail traffic scenario. The relative percentages of maintenance-of-way and management employees would be higher under the low rail traffic scenario. The relative percentage of mechanical employees would be the same under both scenarios.

2.5 Summary of Impacts

Chapter 3, *Affected Environment and Environmental Consequences*, discusses the environmental impacts that could occur as a result of construction and operation of the Indian Canyon Alternative, Wells Draw Alternative, or Whitmore Park Alternative. Table 2-11 provides a summary of the findings in Chapter 3 and compares potential environmental between the three Action Alternatives. The table does not include the No-Action Alternative because existing conditions would remain the same under this alternative.

Table 2-11. Summary of Impacts

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Vehicle Safety and Delay			
Total VMT during construction	194,035,062	328,384,855	234,989,847
Annual VMT during operations	<ul style="list-style-type: none"> • Low rail traffic scenario:^a -902,385 • High rail traffic scenario:^a 1,002,046 	<ul style="list-style-type: none"> • Low rail traffic scenario: -15,409 • High rail traffic scenario: 2,346,551 	<ul style="list-style-type: none"> • Low rail traffic scenario: -835,637 • High rail traffic scenario: 1,135,542
Average daily trips during construction	3,659	3,243	4,163
Average daily trips during operation	<ul style="list-style-type: none"> • Low rail traffic scenario: 4 • High rail traffic scenario: 104 	<ul style="list-style-type: none"> • Low rail traffic scenario: 34 • High rail traffic scenario: 144 	<ul style="list-style-type: none"> • Low rail traffic scenario: 4 • High rail traffic scenario: 104
Average number of accidents at grade crossings per year	<ul style="list-style-type: none"> • Low rail traffic scenario: 0.088 • High rail traffic scenario: 0.153 	<ul style="list-style-type: none"> • Low rail traffic scenario: 0.324 • High rail traffic scenario: 0.559 	<ul style="list-style-type: none"> • Low rail traffic scenario: 0.190 • High rail traffic scenario: 0.331
Average delay at grade crossings in 24-hour period	<ul style="list-style-type: none"> • Low rail traffic scenario: 4.07 minutes • High rail traffic scenario: 11.10 minutes 	<ul style="list-style-type: none"> • Low rail traffic scenario: 7.67 minutes • High rail traffic scenario: 20.89 minutes 	<ul style="list-style-type: none"> • Low rail traffic scenario: 3.99 minutes • High rail traffic scenario: 10.88 minutes
Rail Operations Safety			
Predicted rail accident (collisions and derailments) frequency	0.20 to 0.56 accident per year	0.24 to 0.72 accident per year	0.22 to 0.60 accident per year
Water Resources			
Temporary surface water impacts	<ul style="list-style-type: none"> • Perennial stream: 15.4 acres • Intermittent stream: 0.2 acre • Ephemeral stream: 8.6 acres • Canal/ditch: 1.3 acres • Pond: 1.0 acre • Playa: <0.1 acre 	<ul style="list-style-type: none"> • Perennial stream: 6.5 acres • Intermittent stream: 28.1 acres • Ephemeral stream: 24.7 acres • Canal/ditch: 1.1 acres • Pond: 4.6 acre • Playa: 1.2 acre 	<ul style="list-style-type: none"> • Perennial stream: 16.4 acres • Intermittent stream: 0.2 acre • Ephemeral stream: 15.7 acres • Canal/ditch: 1.3 acres • Pond: 0.9 acre • Playa: <0.1 acre
Permanent surface water impacts	<ul style="list-style-type: none"> • Perennial stream: 6.3 acres • Intermittent stream: 0.2 acre • Ephemeral stream: 4.1 acres • Canal/ditch: 0.9 acre • Pond: 1.0 acre • Playa: 0.1 acre 	<ul style="list-style-type: none"> • Perennial stream: 3.0 acres • Intermittent stream: 30.4 acres • Ephemeral stream: 23.5 acres • Canal/ditch: 0.3 acre • Pond: 3.3 acres • Playa: 0.8 acre 	<ul style="list-style-type: none"> • Perennial stream: 5.6 acres • Intermittent stream: 0.2 acre • Ephemeral stream: 6.4 acres • Canal/ditch: 0.9 acre • Pond: 0.4 acre • Playa: 0.1 acre

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Stream realignments	59 realignments	17 realignments	55 realignments
Section 303(d) Impaired Assessment Unit impacts	2,660.0 acres	7,089.6 acres	2,866.2 acres
Accidental spills of hazardous materials	Depends on train accident or derailment occurrence and severity, but expected to be minimized with mitigation	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Temporary floodplain impacts	0.8 acre	1.7 acres	20.2 acres
Permanent floodplain impacts	0.1 acre	0.2 acre	5.9 acres
Temporary wetland impacts	13.2 acres	16.3 acres	11.2 acres
Permanent wetland impacts	7.0 acres	6.5 acres	3.6 acres
Temporary groundwater wells and springs impacts	<ul style="list-style-type: none"> • Groundwater wells: 6 • Springs: 7 	<ul style="list-style-type: none"> • Groundwater wells: 4 • Springs: 9 	<ul style="list-style-type: none"> • Groundwater wells: 2 • Springs: 4
Permanent groundwater wells and springs impacts	<ul style="list-style-type: none"> • Groundwater wells: 2 • Springs: 2 	<ul style="list-style-type: none"> • Groundwater wells: 1 • Springs: 2 	<ul style="list-style-type: none"> • Groundwater wells: 0 • Springs: 2
Water rights	<ul style="list-style-type: none"> • Water rights within the rail line footprint would be discontinued 	<ul style="list-style-type: none"> • Same as Indian Canyon Alternative 	<ul style="list-style-type: none"> • Same as Indian Canyon Alternative
Biological Resources			
Temporary big game <u>crucial</u> habitat impacts ²	4,803.9 <u>3,782.8</u> acres	10,712.64 <u>4,364.6</u> acres	6,342.65 <u>5,504.6</u> acres
Permanent big game <u>crucial</u> habitat impacts ²	3,421.6 <u>2,406.3</u> acres	6,337.6 <u>2,367.9</u> acres	3,762.82 <u>723.5</u> acres
<u>Temporary big game substantial habitat impacts²</u>	<u>1,837.5 acres</u>	<u>7,595.6 acres</u>	<u>2,144.0 acres</u>
<u>Permanent big game substantial habitat impacts²</u>	<u>1,015.5 acres</u>	<u>3,969.8 acres</u>	<u>1,039.3 acres</u>

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
The largest percent removal of big game crucial habitat in UDWR management unit for any species in any management unit	≤0.38	≤0.97	≤0.59
Number of Big Game Movement Corridor Crossings	36 (6 low importance, 15 medium importance, 15 high importance)	31 (1 low importance, 9 medium importance, 21 high importance)	34 (6 low importance, 15 medium importance, 13 high importance)
Fish habitat degradation	Fewest impacts on fish habitat due to fewest number of surface waters crossed and fewest number of crossing structures	Greatest impacts on fish habitat due to greatest number of surface waters crossed and greatest number of crossing structures	Impacts on fish habitat due to surface water crossings and crossing structures
Temporary vegetation community impacts	2,467.8 acres	5,095.7 acres	3,087.9 acres
Permanent vegetation community impacts	1,340.5 acres	2,559.9 acres	1,430.5 acres
Temporary riparian vegetation impacts	57.1 acres	40.0 acres	54.0 acres
Permanent riparian vegetation impacts	36.5 acres	22.6 acres	27.6 acres
Temporary federally listed plant species habitat impacts	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 46.0 acres • Barneby ridge-cress white shale habitat: 5.4 acres • Pariette cactus: 364.0 acres • Uintah Basin hookless cactus: 364.0 acres • Ute's ladies-tresses: 2.8 acres 	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 0 acre • Barneby ridge-cress white shale habitat: 0 acre • Pariette cactus: 396.5 acres • Uintah Basin hookless cactus: 396.5 acres • Ute's ladies-tresses: 0.1 acres 	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 97.3 acres • Barneby ridge-cress white shale habitat: 14.1 acres • Pariette cactus: 364.0 acres • Uintah Basin hookless cactus: 364.0 acres • Ute's ladies-tresses: 2.7 acres
Permanent federally listed plant species habitat impacts	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 20.0 acres • Barneby ridge-cress white shale habitat: 3.4 acres • Pariette cactus: 140.7 acres • Uintah Basin hookless cactus: 140.7 acres • Ute's ladies-tresses: 1.5 acres 	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 0 acres • Barneby ridge-cress white shale habitat: 0 acres • Pariette cactus: 153.5 acres • Uintah Basin hookless cactus: 153.5 acres • Ute's ladies-tresses: <0.1 acre 	<ul style="list-style-type: none"> • Barneby ridge-cress Pinyon-juniper habitat: 34.3 acres • Barneby ridge-cress white shale habitat: 6.6 acres • Pariette cactus: 140.7 acres • Uintah Basin hookless cactus: 140.7 acres • Ute's ladies-tresses: 1.5 acres

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Temporary Mexican Spotted Owl habitat impacts	865.8 acres	3,535.1 acres	1,531.7 acres
Permanent Mexican Spotted Owl habitat impacts	584.8 acres	1,856.3 acres	777.8 acres
Temporary greater sage-grouse habitat impacts	<ul style="list-style-type: none"> • UDWR-defined: 459.8 acres • BLM-defined: 544.0 acres 	<ul style="list-style-type: none"> • UDWR-defined: 459.8 acres • BLM-defined: 588.0 acres 	<ul style="list-style-type: none"> • UDWR-defined: 1,123.6 acres • BLM-defined: 1,047.0 acres
Permanent greater sage-grouse habitat impacts	<ul style="list-style-type: none"> • UDWR-defined: 294.5 acres • BLM-defined: 360.3 acres 	<ul style="list-style-type: none"> • UDWR-defined: 294.5 acres • BLM-defined: 328.3 acres 	<ul style="list-style-type: none"> • UDWR-defined: 482.8 acres • BLM-defined: 486.4 acres
Train noise impacts on at five closest greater sage-grouse leks	37–79 dBA	37–79 dBA	49–64 dBA
Geology, Soils, Seismic Hazards, and Hazardous Waste Sites			
Distance of the proposed rail line that would cross unstable geologic units	21 miles	54 miles	18 miles
Area of soil disturbance	1,340 acres	2,560 acres	1,431 acres
Impacts on hazardous waste sites	None	None	None
Surface fault rupture and seismic ground shaking	Possibility for seismic movement with the potential to cause landslides, but expected to be minimized with mitigation	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Noise and Vibration			
Number of receptors adversely affected by construction-related noise	0	0	0
Number of receptors adversely affected by construction-related vibration	0	0	0

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Number of receptors adversely affected by operations-related noise	6	1	2
Number of receptors adversely affected by operations-related vibration	0	0	0
Air Quality			
Construction-related criteria pollutant emissions	<ul style="list-style-type: none"> • CO: 917 tons • NOx: 512 tons • PM10: 779 tons • PM2.5: 228 tons • SO₂: 2 tons • VOCs: 94 tons 	<ul style="list-style-type: none"> • CO: 1,541 tons • NOx: 649 tons • PM10: 1,075 tons • PM2.5: 299 tons • SO₂: 2 tons • VOCs: 146 tons 	<ul style="list-style-type: none"> • CO: 992 tons • NOx: 598 tons • PM10: 880 tons • PM2.5: 281 tons • SO₂: 2 tons • VOCs: 103 tons
Operations-related criteria pollutant emissions	<ul style="list-style-type: none"> • Low rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 136 tons/year ○ NOx: 343 tons/year ○ PM10: 10 tons/year ○ PM2.5: 7 tons/year ○ SO₂: 0.4 tons/year ○ VOCs: 13 tons/year • High rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 373 tons/year ○ NOx: 969 tons/year ○ PM10: 29 tons/year ○ PM2.5: 21 tons/year ○ SO₂: 1 ton/year ○ VOCs: 36 tons/year 	<ul style="list-style-type: none"> • Low rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 176 tons/year ○ NOx: 413 tons/year ○ PM10: 13 tons/year ○ PM2.5: 9 tons/year ○ SO₂: 0.5 tons/year ○ VOCs: 18 tons/year • High rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 479 tons/year ○ NOx: 1,162 tons/year ○ PM10: 35 tons/year ○ PM2.5: 26 tons/year ○ SO₂: 2 ton/year ○ VOCs: 48 tons/year 	<ul style="list-style-type: none"> • Low rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 147 tons/year ○ NOx: 374 tons/year ○ PM10: 11 tons/year ○ PM2.5: 8 tons/year ○ SO₂: 0.4 tons/year ○ VOCs: 14 tons/year • High rail traffic scenario: <ul style="list-style-type: none"> ○ CO: 405 tons/year ○ NOx: 1,056 tons/year ○ PM10: 32 tons/year ○ PM2.5: 23 tons/year ○ SO₂: 1 ton/year ○ VOCs: 40 tons/year
Concentrations in comparison to the NAAQS	All concentrations would be less than the NAAQS at all modeled locations. 1-hour NO₂ concentration could exceed the NAAQS at one location south of Myton under certain conditions. This outcome is unlikely to occur and would not impact sensitive receptors.	Same as Indian Canyon Alternative. All concentrations would be less than the NAAQS at all modeled locations.	Same as Indian Canyon Alternative. 1-hour NO₂ concentration could exceed the NAAQS at one location south of Myton under certain conditions. This outcome is unlikely to occur and would not impact sensitive receptors.

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Energy			
Electricity consumption and distribution	Existing electricity distribution system would be adequate for construction and operations	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Construction-related fuel (gasoline and diesel) consumption	19,859,000 gallons	27,803,000 gallons	23,217,000 gallons
Operations-related fuel (gasoline and diesel) consumption	<ul style="list-style-type: none"> Low rail traffic scenario: 3,955,941 gallons/year High rail traffic scenario: 11,696,171 gallons/year 	<ul style="list-style-type: none"> Low rail traffic scenario: 5,206,157 gallons/year High rail traffic scenario: 15,127,985 gallons/year 	<ul style="list-style-type: none"> Low rail traffic scenario: 4,341,206 gallons/year High rail traffic scenario: 12,765,347 gallons/year
Impacts on utilities (pipelines and transmission lines)	114 utilities would be crossed; some but impacts on service would be avoided or minimized with mitigation but some portions of existing pipelines may need to be relocated	6 utilities would be crossed but impacts on service would be avoided or minimized with mitigation	136 utilities would be crossed; some but impacts on service would be avoided or minimized with mitigation but some portions of existing pipelines may need to be relocated
Number of oil and gas wells adversely affected by construction	4	11	2
Cultural Resources			
Sensitive cultural resources physically affected	14	12	13
Sensitive cultural resources affected by change in setting	2	7	3
Paleontological Resources			
PFYC acreage in the project footprint	<ul style="list-style-type: none"> PFYC 5: 787 acres PFYC 4: 879 acres PFYC 3: 628 acres 	<ul style="list-style-type: none"> PFYC 5: 926 acres PFYC 4: 4,901 acres PFYC 3: 628 acres 	<ul style="list-style-type: none"> PFYC 5: 853 acres PFYC 4: 977 acres PFYC 3: 1,370 acres
Scientifically important fossil localities in the project footprint	26	1	26

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Land Use and Recreation			
Temporary disturbance by land ownership	<ul style="list-style-type: none"> • BLM: 73 acres • SITLA: 285 acres • Tribal: 257 acres • UDOT: 4 acres • Forest Service: 234 acres • Private: 1,614 acres 	<ul style="list-style-type: none"> • BLM: 3,246 acres • SITLA: 554 acres • Tribal: 0 acres • UDOT: 1 acre • Forest Service: 0 acres • Private: 1,293 acres 	<ul style="list-style-type: none"> • BLM: 0 acres • SITLA: 283 acres • Tribal: 255 acres • UDOT: 4 acres • Forest Service: 234 acres • Private: 2,312 acres
Permanent disturbance by land ownership	<ul style="list-style-type: none"> • BLM: 46 acres • SITLA: 158 acres • Tribal: 121 acres • UDOT: <1 acre • Forest Service: 167 acres • Private: 847 acres 	<ul style="list-style-type: none"> • BLM: 1,571 acres • SITLA: 327 acres • Tribal: 0 acres • UDOT: 0 acre • Forest Service: 0 acres • Private: 662 acres 	<ul style="list-style-type: none"> • BLM: 0 acres • SITLA: 103 acres • Tribal: 118 acres • UDOT: 0 acre • Forest Service: 167 acres • Private: 1,042 acres
Temporary disturbance of agricultural land in the study area	<ul style="list-style-type: none"> • Irrigated cropland: 145 acres • Prime farmland: 56 acres 	<ul style="list-style-type: none"> • Irrigated cropland: 35 acres • Prime farmland: 15 acres 	<ul style="list-style-type: none"> • Irrigated cropland: 145 acres • Prime farmland: 56 acres
Permanent disturbance of agricultural land in the study area	<ul style="list-style-type: none"> • Irrigated cropland: 92 acres • Prime farmland: 6 acres 	<ul style="list-style-type: none"> • Irrigated cropland: 6 acres • Prime farmland: 4 acres 	<ul style="list-style-type: none"> • Irrigated cropland: 92 acres • Prime farmland: 6 acres
Temporary loss of AUMs	50	176	73
Permanent loss of AUMs	34	88	37
Special designations	Forest Service Inventoried Roadless Areas	Route would cross BLM's Lears Canyon ACEC, Nine Mile Canyon ACEC, two Lands with Wilderness Characteristics areas, and the Nine Mile SRMA	Same as Indian Canyon Alternative
BLM Land Use Plan Amendment Required	Yes	Yes	No
Forest Service Land Use Plan Amendment Required	Yes	No	Yes
Disturbance within Forest Service Inventoried Roadless Areas	394 acres	0 acres	394 acres

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Cooperative Wildlife Management Units impacts	816 acres	466 acres	1,472 acres
Conservation Easements affected	1	0	1
Visual Resources			
RKOP scenic quality ratings on BLM-administered lands	No change in scenic quality rating	Same as Indian Canyon Alternative	Alternative does not cross BLM-administered land
Visual quality ratings on other federal, state, tribal, and private land	<ul style="list-style-type: none"> • No change in rating at 1 RKOP • -1 reduced rating at 2 RKOPs • -2 reduced rating at 23 RKOPs • -3 reduced rating at 1 RKOP • -4 reduced rating at 1 RKOP 	<ul style="list-style-type: none"> • -1 reduced rating at 1 RKOP • -2 reduced rating at 12 RKOPs • -4 reduced rating at 1 RKOP 	<ul style="list-style-type: none"> • -1 reduced rating at 23 RKOPs • -2 reduced rating at 32 RKOPs • -3 reduced rating at 1 RKOP
Sensitive viewscapes	<ul style="list-style-type: none"> • Ashley National Forest • BLM lands • Tribal trust lands • Indian Canyon Scenic Byway • Reservation Ridge Scenic Backway 	<ul style="list-style-type: none"> • Ashley National Forest • BLM lands • Reservation Ridge Scenic Backway 	Same as Indian Canyon Alternative
Infrastructure changes	<ul style="list-style-type: none"> • Install 4 new towers • Install 6 new sidings • Remove 3 nonresidential structures 	<ul style="list-style-type: none"> • Install 4 new towers • Install 3 new sidings • Remove 4 residences • Remove 1 other structure 	<ul style="list-style-type: none"> • Install 4 new towers • Install 9 new sidings • Remove 1 residence • Remove 5 other structures
Socioeconomics			
Land acquisitions required	3,808.2 acres	7,655.3 acres	4,518.3 acres
Impacts on private property	Greatest adverse impact on smaller private property owners because it would cross the greatest number of smaller-subdivided properties in the Argyle Canyon and Duchesne Mini-Ranches areas of Duchesne County	Route would affect the smallest area of private property, but would displace the largest number of residences	Route would affect the largest area of private property across the three Action Alternatives and would primarily affect larger property owners and ranching and farming operations
Annual employment, labor income, and value added impacts from construction	\$290.6 million	\$351.3 million	\$311.8 million

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Annual Employment (direct, indirect, induced) during Operations	<ul style="list-style-type: none"> Low rail traffic scenario: 170 jobs High rail traffic scenario: 420 jobs 	<ul style="list-style-type: none"> Low rail traffic scenario: 220 jobs High rail traffic scenario: 530 jobs 	<ul style="list-style-type: none"> Low rail traffic scenario: 190 jobs High rail traffic scenario: 470 jobs
Annual labor income from operation	<ul style="list-style-type: none"> Low rail traffic scenario: \$8.3 million High rail traffic scenario: \$23.3 million 	<ul style="list-style-type: none"> Low rail traffic scenario: \$10.4 million High rail traffic scenario: \$29.0 million 	<ul style="list-style-type: none"> Low rail traffic scenario: \$9.3 million High rail traffic scenario: \$25.8 million
Operations-related state tax revenue	<ul style="list-style-type: none"> Low rail traffic scenario: \$0.4–0.5 million High rail traffic scenario: \$1.1–1.4 million 	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Environmental Justice			
Air Quality, Water Resources, Land Use, Socioeconomics, Vehicle Safety and Delay, Rail Operations Safety, Noise	No disproportionately high and adverse impacts on minority or low-income populations	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Cultural resources	Impacts may disproportionately affect the Ute Indian Tribe but would be mitigated and would not be high and adverse	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Biological resources	Effects on suitable habitat for the Paria cactus and Uinta Basin hookless cactus would represent a disproportionately high and adverse effect on the Ute Indian Tribe	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Downline			
Delay at downline at-grade road crossings	Increase delay up to 9.84 seconds per vehicle	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Predicted downline rail accident frequency at grade crossings	Increase of 0.001 to 0.024 accident per year	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative
Noise level increases at downline receptors	0.4 dB to 6.0 dB	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative

Impact	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Maximum downline criteria pollutant emissions	<ul style="list-style-type: none"> CO: 1,048.35^{1,803.68} tons/year NOx: 2,913.84^{5,013.24} tons/year PM10: 63.00^{108.39} tons/year PM2.5: 61.11^{105.14} tons/year SO₂: 3.70^{6.36} tons/year VOC: 103.66^{178.34} tons/year 	Same as Indian Canyon Alternative	Same as Indian Canyon Alternative

Notes:

^a The Coalition estimates that rail traffic on the proposed rail line could range from as few as 3.68 trains per day, on average (the low rail traffic scenario), to as many as 10.52 trains per day, on average (the high rail traffic scenario), depending on future market conditions, including future demand for crude oil produced in the Basin.

^b Notably, there is significant overlap of big game habitat for the different big game species (see Appendix G, *Biological Resources Figures, for big game habitats along the Action Alternatives*), and the permanent and temporary habitat impacts affect multiple big game species in those areas of habitat overlap.

VMT = vehicle miles traveled; UDWR = Utah Division of Wildlife Resources; BLM = U.S. Department of the Interior, Bureau of Land Management; dBA =A-weighted decibels; dB = decibels; CO = carbon monoxide; NOx = nitrogen oxides; PM10 = particulate matter 10 microns or less in diameter; PM2.5 = particulate matter 2.5 microns or less in diameter; SO₂ = sulfur dioxide; VOCs = volatile organic compounds; NO₂ = nitrogen dioxide; NAAQS = National Ambient Air Quality Standards; PFYC = Potential Fossil Yield Classification; AUM = animal unit month; SITLA = School and Institutional Trust Lands Administration; UDOT = Utah Department of Transportation; ACEC = Area of Critical Environmental Concern; SRMA = Special Recreation Management Area; Forest Service = U.S. Forest Service; RKOP = rendered key observation point

2.6 Environmentally Preferred Alternative

Based on OEA's analysis and consultation with appropriate government agencies, the Ute Indian Tribe, other interested stakeholders, and the public, OEA ~~preliminarily~~ concludes that, among the three Action Alternatives, the Whitmore Park Alternative would result in the fewest significant impacts on the environment. In particular, the Whitmore Park Alternative would permanently affect the smallest area of water resources, including wetlands and perennial streams; would minimize impacts on greater sage-grouse leks and associated summer brood rearing habitat; and would avoid impacts on subdivided residential areas.

Compared to the Wells Draw Alternative, the Whitmore Park Alternative would permanently and temporarily affect a smaller area of wetlands and of intermittent streams, as well as a smaller number of springs. It would avoid impacts on special use areas on BLM-administered lands, including Areas of Critical Environmental Concern, Lands with Wilderness Characteristics, and areas classified by BLM as sensitive to visual impacts. The Whitmore Park Alternative would affect a smaller area of suitable habitat for the Endangered Species Act-listed Pariette cactus (*Sclerocactus brevispinus*) and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*) than the Wells Draw Alternative, would avoid potential impacts on moderately suitable habitat for the ESA-listed Mexican spotted owl (*Strix occidentalis lucida*) and would affect a smaller area of big game habitat. In addition, it would result in fewer total emissions of criteria air pollutants and greenhouse gases during construction and during rail operations; would cross a smaller area of land that may be prone to landslides; would result in fewer displacements of residences; would involve a lower risk for accidents at at-grade road crossings; and would cross a smaller area with high potential for wildfires.

Compared to the Indian Canyon Alternative, the Whitmore Park Alternative would permanently and temporarily affect a smaller area of wetlands, a smaller area of riparian habitat, and smaller number of springs and would also require fewer stream realignments. It would avoid noise impacts on residences during rail operations, as well as visual and other impacts on residential areas in the Argyle Canyon and Duchesne Mini-Ranches areas of Duchesne County. The Whitmore Park Alternative would generate more employment, labor income, and local and state tax revenue during construction than the Indian Canyon Alternative and would cross a smaller area of geological units that may be prone to landslides and a smaller area of land with high wildfire hazard potential.

For these reasons, should the Board decide to authorize construction and operation of the proposed rail line, OEA ~~preliminarily~~ recommends that the Board authorize the Whitmore Park Alternative to minimize impacts of construction and operation on the environment. ~~OEA invites agency and public comment on this preliminary recommendation and will make its final recommendations to the Board in the Final EIS after considering all comments received during the public comment period.~~