

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This analysis considers in detail a no action alternative and the proposed action.

The goal of this chapter is to describe and compare the differences among the alternatives, especially how the environmental effects of each differ. This comparison clearly frames the issues, informs the public, and provides a clear basis for choice among options for the decision-maker.

2.1.1 Formulation of Alternatives

Alternatives were formulated based on the purpose of and need for action identified in Chapter 1.0, the responses to public scoping, and further internal review by the Forest Service to ensure that a range of reasonable alternatives was considered and analyzed.

Scoping identified issues and concerns associated with the proposed action that were expressed by the public. Issues identified during scoping are addressed in this analysis in the following ways: formulation of alternatives; design criteria for alternatives; mitigation measures applied to alternatives; and analysis of alternatives.

Issues are categorized as significant or non-significant. Significant issues are those that were used during the formulation of alternatives. Significant issues are usually addressed by considering alternatives to the proposed action, whether they were considered in detail or dropped from further analysis. Other (non-significant) issues represent substantial concerns; however, these issues are usually addressed within the design criteria of the proposed alternatives, mitigation measures, or tracked through the effects analyses. The significant issues used in the formulation of alternatives are summarized below.

Effects of Pipeline Route on Wildlife and Wildlife Habitat - The proposed pipeline route should be designed to minimize impacts to wildlife, especially elk feedgrounds, big game seasonal use habitats, and migration routes.

Coordination of Pipeline Route, Specifications, and River Crossings with Other Agencies - The use of the Hoback Canyon highway corridor on National Forest System (NFS) lands for the proposed pipeline route and specifications for pipeline construction, operation, and maintenance, including river crossings, should be coordinated with other agencies. Alternative routes that avoid the Hoback Canyon highway corridor should be explored.

Disturbance of the Hoback River and Hoback Canyon – The proposed pipeline route and specifications for pipeline construction, operation, and maintenance, including river crossings should minimize disturbance, prevent pollution of the Hoback River, and should not impact the scenic qualities of Hoback Canyon.

Public Safety – Construction and operation of the pipeline should not increase hazards to public safety or violate environmental safety. Public safety concerns regarding the pipeline construction and operation should be evaluated. The pipeline would reduce hazards associated with tanker trucks on highways; however, fire danger may increase during construction of the pipeline.

Two non-significant issues also contributed to the development of alternatives.

Roadless Areas and Roadless Characteristics – Pipeline construction should not occur in roadless areas in order to preserve their roadless characteristics.

Slope Stability and Pipeline Integrity in Steep or Unstable Areas – The proposed pipeline could increase the potential for slope failures in steep or unstable areas, potentially affecting pipeline integrity and public safety unless potential effects can be mitigated by pipeline design specifications or route adjustments.

The interdisciplinary team (IDT) assembled the alternatives and eliminated all action alternatives except one from detailed study based on criteria designed to exclude alternatives that are not reasonable. The NEPA process requires that alternatives evaluated in detail be reasonable. Reasonable alternatives include those that are practical or feasible from a technical standpoint, and those that are based on common sense.

The IDT then developed the alternative to be considered in detail as the proposed action, including design criteria, mitigation measures, and monitoring requirements, to respond to the significant issues and the purpose and need. An independent engineering design review addressing the location and design of portions of the pipeline route within the highway corridor was conducted for the Wyoming Department of Transportation (WYDOT) by PB Energy Storage Services, Inc. (2005). The results of this review were used in the design of the proposed action; however, continued coordination between WYDOT and LVE since the final report was issued has resulted in joint agreement to modify some design criteria in an effort to reduce surface disturbance without compromising public safety. The proposed action and no action alternatives considered in detail in this analysis represent different ways to respond to the purpose and need and address the significant issues identified during the scoping process. The significant issues, as well as planning and policy guidelines, contributed to the formulation of the screening criteria.

2.1.2 Considerations for Alternatives

The following criteria were used to establish a threshold for developing potential action alternatives that respond to the purpose of and need for the proposed action and meet Forest Service policy and direction.

1. The alternative should be consistent with Forest-wide and management area (MA) guidance (standards and guidelines) and Desired Future Conditions (DFCs) in the Forest Plan and other applicable Forest Service policy and direction.
2. The alternative must respond to the purpose of and need for action.
3. The alternative must be technically feasible while remaining environmentally responsible.
4. The alternative must be capable of being implemented in a timely manner.

2.2 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Fifteen additional alternatives were identified during the formulation of the proposed action and no action alternatives. These alternate routes and route segments are shown in **Figure 2-1**. Based on considerations for alternatives presented above and the analysis presented in this section, these additional alternatives were eliminated from detailed consideration. Two alternate design criteria for the proposed project, boring river and stream crossings and boring the Camp Creek landslide area, are considered later in this chapter under Design Criteria for Alternative B – Proposed Action on pages 2-37 and 2-38. Alternatives based on energy conservation and alternative energy sources are outside the scope of this EIS analysis, which responds to a special use application submitted by LVE, and are not considered further.

Figure 2-1 Routes and Route Segments Considered but Dropped

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The alternatives evaluated below were determined not to be reasonable. The theme, a discussion of the alternative, and the analysis and rationale for eliminating each of these alternatives are presented below.

Alternative: Battle Mountain Segment (**Figure 2-1**, No. 1)

Theme: Reduce the effects of pipeline construction and maintenance on the Hoback River, the highway corridor, and WYDOT's activities by realigning a portion of the proposed pipeline route away from the Hoback River and the highway corridor.

Discussion: An alternative was considered that would realign a portion of the pipeline route to reduce the length of the route that follows the Hoback River and the highway corridor. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. This route modification would reduce the effects of pipeline construction and maintenance within and near the Hoback River and the highway corridor used by WYDOT. This proposed route segment would pass north of Game Hill and Battle Mountain and cross Granite Creek. The segment would traverse steep sidehill slopes, produce visible scars, and cross unstable slopes, an existing landslide in the E1/2 of Section 4 of T.38N. R.114W., Granite Creek, a popular recreation area, and Shoal Creek. Significant quantities of rock would have to be moved by blasting to construct the pipeline along this route. Reclamation of disturbed areas would be difficult and prone to revegetation failure and excessive erosion. A portion of the proposed route is forested and would require cutting of trees during construction. No crossing of the Hoback River would be eliminated by this alternative.

The visual impacts resulting from construction of the pipeline along this route would not meet applicable Forest Plan standards for the Hoback River Canyon and the scenic byway. Visual impacts must not be evident and visual quality objectives (VQOs) of preservation or retention must be met in the foreground viewing zone of a ½-mile-wide corridor along the Hoback River under the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision). Also, the highway route through Hoback Canyon is designated as a sensitive travel corridor. A VQO of retention in the foreground and retention/partial retention in the middleground must be met in accordance with the Scenic Byway and Wild and Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision).

Rationale: This alternative was dropped because a visible scar from the construction of the pipeline along this alignment would be evident from the Hoback Canyon highway and the Granite Creek area. Applicable Forest Plan visual quality standards would not be met under this alternative. In addition, Granite Creek, a tributary to the Hoback River, has been designated by the State of Wyoming as a Class 1 stream. Class 1 waters are specially designated waters in which the existing water quality is protected regardless of the uses supported by the water. The crossing of Granite Creek could be avoided by a viable alternative that would not cross the creek.

Alternative: Muddy Creek Route (**Figure 2-1**, No. 2)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route away from the highway corridor.

Discussion: An alternative was considered that would realign a portion of the pipeline route to reduce the length of the route that follows the highway corridor. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. This route modification would reduce the effects of pipeline construction and maintenance within and near the highway corridor used by WYDOT. This proposed route would follow along and near the Muddy Creek drainage in the Noble Basin area, avoiding willow wetlands in the Beaver Creek area. Disturbance associated with this route would be visible from the Upper Hoback area. This route would disturb highly erodible and clayey soils, making erosion and sediment control, soil handling, and reclamation difficult. A forested area located in the W1/2SE1/4 of Section 21 in T.36N. R.113W. would have to be cleared to avoid an unstable area. This alternative also would require construction of temporary road access to the pipeline route in inaccessible areas. The temporary road access would affect a roadless area.

Rationale: This alternative was dropped because it would traverse a roadless area, existing landslides, and unstable slopes.

Alternative: Hoback Junction and Snake River Route (**Figure 2-1**, No. 3)

Theme: Concentrate pipeline construction and maintenance activities in previously disturbed areas along the highway corridor.

Discussion: An alternative route segment was considered that would follow the highway corridor from the Camp Creek area to Hoback Junction, and then north from Hoback Junction along the Snake River toward Jackson. This alternative route segment would traverse an extensive area of active landslides. This alternative would also increase the length of the pipeline route that follows the highway corridor and reduce new disturbance associated with pipeline construction, but would require two crossings of the Snake River. This alternative would also have the potential to affect a cultural resource site on BLM lands near the Snake River.

Rationale: This alternative was dropped because it would traverse active landslides and highly unstable areas north and east of Hoback Junction, and it was not considered to be technically or economically feasible to construct. Landslide areas, including the E1/2W1/2 of Section 23 and the N1/2NE1/4 of Section 26 in T.39N. R.116W. are so unstable that WYDOT is considering rerouting the portion of the highway that passes through the area. The alignment and design considerations for a highway in a landslide area would not be the same as the considerations for a pipeline through the same landslide area. The aboveground installation of the pipeline in a landslide area, which is the design selected for the proposed project to minimize the risk of rupture caused by a landslide, would not be feasible for a pressurized gas pipeline located in close proximity to a highway. In addition, the two crossings of the Snake River could be avoided by a viable alternative that would not cross the Snake River.

Alternative: Kelly Route (**Figure 2-1**, No. 4)

Theme: Reduce the effects of pipeline construction and maintenance on the Hoback River, the Hoback Canyon highway corridor, and WYDOT's activities by realigning the proposed pipeline route to keep it away from the Hoback River and Hoback Canyon highway corridor.

Discussion: An alternative was considered that would realign the proposed pipeline route to follow the drainages of the Upper Green River and Gros Ventre River, along existing road corridors where possible, to the Kelly area near Jackson, and then continue through Jackson to the Lower Valley Energy (LVE) facilities, a distance of 92.0 miles. This alternative would keep the pipeline route away from the Hoback River and Hoback Canyon, but would cross a portion of Grand Teton National Park (GTNP) and the National Elk Refuge. The management goal for National Park lands is preservation of special values for the enjoyment of the public, which is not compatible with surface disturbance associated with the construction of a pipeline. Special legislation would be required to implement this alternative. In order to reach LVE facilities south of Jackson, a pressurized gas line would be routed through the Town of Jackson at a cost of about \$800,000 per mile.

Rationale: This alternative was dropped because it was not considered to be economically feasible or environmentally responsible. This alternative route is considerably longer than the proposed route (92.0 miles instead of 49.7 miles for the route proposed by LVE), at an increased cost averaging \$400,000 per additional mile, or a total increased cost of \$16.9 million – about twice the cost of the proposed pipeline route. Crossing GTNP lands was not considered to be environmentally responsible when a viable alternative exists that would not cross GTNP lands. This alternative would also cross previously undisturbed areas, including the National Elk Refuge.

This alternative could not be approved under existing authorities for the National Park Service (NPS) and is not in accordance with the mission of the NPS. National parks conserve scenery, natural and historic objects, and wildlife for their enjoyment by the people in a manner that will leave them unimpaired for the enjoyment of future generations. An Act of Congress would be required to approve a pipeline route that crosses GTNP lands.

Alternative: Ramshorn Route (**Figure 2-1**, No. 5)

Theme: Reduce the effects of pipeline construction and maintenance on the Hoback River, the highway corridor, and WYDOT's activities by realigning the proposed pipeline route to keep it away from the Hoback River and the highway corridor.

Discussion: An alternative was considered that would realign a large portion of the pipeline route to reduce the length of the route that follows the Hoback River and the highway corridor. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. This route modification would reduce the effects of pipeline construction and maintenance within and near the Hoback River and the highway corridor used by WYDOT. This alternative route segment would cross steep topography, important wildlife habitats, and roadless areas. It would follow trails through high mountainous areas in the northern end of the Wyoming Range from the Camp Davis area to the Noble Basin area, traversing the Willow Creek and Cliff Creek drainages and the Ramshorn Peak and Monument Ridge areas.

Rationale: This alternative was dropped because it was not considered to be economically or technically feasible or environmentally responsible. This route would traverse previously undisturbed areas, including steep topography, important wildlife habitats, and roadless areas. New cross-country construction would involve costly blasting along steep sidehill slopes, which could destabilize these slopes. Maintenance problems would be likely for this route, as the high portions of this route would be inaccessible for up to 6 months of the year for corrective actions.

Alternative: East Bypass (**Figure 2-1**, No. 6)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of proposed pipeline route away from the highway corridor.

Discussion: An alternative was considered that would realign a segment of the proposed pipeline route to avoid the highway corridor from the LVE facility south of Jackson to the Game Creek area. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. This alternative route segment would follow existing power lines along steep sidehill slopes, crossing three steep-walled canyons. Erosion and sediment control, soil handling, and reclamation would be extremely difficult. It would reduce the length of the pipeline route that follows the highway corridor, but would also cross an existing landfill and shooting range on BLM lands.

Rationale: This alternative was dropped because it would cross steep sidehill slopes, three steep-walled canyons, and a landfill and shooting range. While the existing power line route is feasible for a power line, where lines span unfavorable topography, the continuous construction associated with a pipeline could introduce slope stability issues along steep sidehill slopes. Pipeline construction along sidehill slopes would leave a visible scar that would be evident from the highway.

Alternative: Snake River Connector (**Figure 2-1**, No. 7)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of proposed pipeline route away from the highway corridor.

Discussion: An alternative was considered that would realign a segment of the proposed pipeline route to avoid the highway corridor south of Jackson from a location near Porcupine Creek along the Snake River to a location near Horse Creek. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. This alternative route segment would reduce the length of the pipeline route that follows the highway corridor, but would also traverse unstable areas and require a crossing of the Snake River. Erosion and sediment control, soil handling, and reclamation would be difficult. This route would be visible to travelers and some residents.

Rationale: This alternative was dropped because the crossing of the Snake River could be avoided by a viable alternative that would not cross the Snake River. Hanging the pipeline on the existing highway bridge would not be allowed under existing WYDOT rules (see the next alternative below for additional explanation). This route would also cross unstable areas near the Snake River and would be visible from some areas.

Alternative: Avoid Landslide in Camp Creek Saddle Area (**Figure 2-1**, No. 8)

Theme: Eliminate the effects of pipeline construction and maintenance on an existing landslide in the Camp Creek Saddle area by modifying the pipeline route so that the landslide area is avoided.

Discussion: An alternative was considered that would modify the alignment of the pipeline in the vicinity of Camp Creek Saddle, where the slide plane in an active landslide is 40 to 60 feet below the

surface. The modified alignment would avoid the landslide area by diverting the pipeline route down a steep spur ridge located just east of Camp Creek Saddle. Pipeline construction would involve considerable surface disturbance along this spur ridge. Erosion and sediment control, soil handling, and reclamation would be extremely difficult.

The visual impacts from construction of the pipeline along this route would not meet applicable Forest Plan standards for Hoback Canyon and the scenic byway. Visual impacts must not be evident and VQOs of preservation or retention must be met in the foreground viewing zone of a ½-mile-wide corridor along the Hoback River under the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision). Also, the highway route through Hoback Canyon is designated as a sensitive travel corridor. A VQO of retention in the foreground and retention/partial retention in the middleground must be met in accordance with the Scenic Byway and Wild and Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision).

Rationale: This alternative was eliminated from detailed consideration because applicable Forest Plan visual quality standards would not be met. A visible scar from the construction of the pipeline along this alignment would be evident from the Hoback Canyon highway near Camp Creek.

Alternative: Hoback Canyon Power Line Route (**Figure 2-1**, No. 9)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning the proposed pipeline route to follow the existing power line through Hoback Canyon.

Discussion: An alternative was considered that would follow the existing power line route through Hoback Canyon. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. Pipeline construction would involve costly blasting along extremely steep slopes, which could destabilize these slopes. Excavation associated with the construction of the pipeline would result in visually evident scarring along the river and highway corridor in Hoback Canyon. Erosion and sediment control, soil handling, and reclamation would be extremely difficult. Pipeline construction activities occurring above the highway and river would likely initiate dangerous rockfall on the highway and recreationists below. In addition, the Gros Ventre Wilderness boundary coincides with the existing power line route in some locations. A pipeline could not be constructed along this alignment without encroaching on the designated wilderness.

The visual impacts in the foreground viewing zone from construction of the pipeline along this route would not meet the VQO established for Hoback Canyon and the scenic byway. Visual impacts must not be evident and VQOs of preservation or retention must be met in the foreground viewing zone of a ½-mile-wide corridor along the Hoback River under the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision). Also, the highway route through Hoback Canyon is designated as a sensitive travel corridor. A VQO of retention in the foreground and retention/partial retention in the middleground must be met in accordance with the Scenic Byway and Wild and Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision).

Rationale: This alternative was dropped because it was not considered to be economically or technically feasible. This route would traverse steep topography and require costly blasting, which would

increase rockfall hazards and could further destabilize naturally unstable slopes. This route would encroach on the Gros Ventre Wilderness in places, and would not be in compliance with the Wyoming Wilderness Act and applicable Forest Plan guidance and, therefore, could not be approved.

Construction of the proposed pipeline along an alignment that follows the Hoback Canyon power line route would also not be consistent with applicable Forest Plan guidance for visual resources. Applicable visual quality standards could not be met under this alternative.

Alternative: Granite Creek Segment (Figure 2-1, No. 10)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route near Granite Creek to follow an existing trail through a timbered area along the Hoback River, keeping that portion of the route away from the highway corridor.

Discussion: An alternative (WYDOT Alternative No. 3) was considered that would follow an existing trail through a timbered area along the Hoback River instead of the highway corridor, which would require two additional crossings of the Hoback River near Granite Creek. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. The alternative would begin at the river crossing near the confluence of Granite Creek and the Hoback River. Rather than crossing the highway just west of Granite Creek Road, the pipeline route would continue for 100 yards or so along the south side of the highway north of the river. At this point, the pipeline route would cross the Hoback River again and follow an old trail along the south side of the river. The existing trail is about 8 feet wide and would require a sidehill bench cut that is 30 to 40 feet wide along its entire length. This cut would produce a noticeable visual scar.

Unless a temporary access road is constructed in a roadless area, all construction equipment would have to be taken through the river to perform the construction work along the south side of the river where there is no existing road access. The river appears to be about 120 feet wide in this area, which would be too wide for temporary bridges such as rail flats that are 85 feet long. The trail, which continues along the river to the west and rejoins the highway, could be upgraded to serve as a temporary access road, although it gets close to the river at a couple of bends and may be washed out in places. If the trail is used for access, several areas would need to be widened for passing.

The visual impacts along this route would not meet the VQOs established for Hoback Canyon and the scenic byway. Visual impacts must not be evident and VQOs of preservation or retention must be met in the foreground viewing zone of a ½-mile-wide corridor along the Hoback River under the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision). Also, the highway route through Hoback Canyon is designated as a sensitive travel corridor. A VQO of retention in the foreground and retention/partial retention in the middleground must be met in accordance with the Scenic Byway and Wild and Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision).

Rationale: This alternative was eliminated from detailed consideration because a visible scar from the construction of the pipeline would be evident from the Hoback Canyon highway near Granite Creek. Two additional crossings of the Hoback River near Granite Creek could be avoided. Applicable Forest Plan visual quality standards would not be met under this alternative.

Alternative: Bridge Crossings of the Hoback River (Not Shown in **Figure 2-1**)

Theme: Reduce the effects of pipeline construction and maintenance on the Hoback River by attaching the pipeline to existing bridges across the Hoback River.

Discussion: An alternative was considered that would modify the alignment of the river crossings along the proposed route by attaching the pipeline to existing bridges across the Hoback River. The highway bridge structures that would be affected by attachment of the proposed pipeline are facilities owned and maintained by WYDOT, and are managed in accordance with WYDOT rules. According to existing WYDOT rules and policies, attachment of gas pipelines to highway bridges can only be authorized if the pipeline has an inside diameter of 4 inches or less and a line pressure of 60 psig (pounds per square inch gauge) or less. WYDOT's requirement limits the volume and pressure of additional flammable material (natural gas transported by pipeline attached to a highway bridge) that could contribute to the seriousness of the impacts associated with a crash involving a bridge. A review of crash statistics for Wyoming indicates that 283 crashes were associated with bridges in 2006, including 5 fatal crashes (WYDOT 2007a). A large, intense fire from a crash could cause sufficient damage to a bridge to initiate a pipeline incident. A fire resulting from the crash of a gasoline tanker truck into a guard rail on a bridge overpass in California caused steel bridge supports to melt and the bridge to collapse (San Francisco Chronicle 2007). An incident such as this recent California crash illustrates the potential risk associated with a pipeline attached to a bridge.

Rationale: This alternative was dropped because it was not considered to be technically feasible to attach a pressurized natural gas pipeline, as proposed, to highway bridges without reducing the safety factor judged by WYDOT to be appropriate for the bridge facilities operated and maintained by the agency. The proposed pipeline could not be attached to highway bridges that cross the Hoback River according to existing WYDOT rules because of its specifications. The proposed pipeline would have an inside diameter of 6 inches and a line pressure of more than 60 psig (pounds per square inch gauge), which would not comply with WYDOT rules, Chapter VI, Utility Construction within Highway Right-of-Way, Section 5, Attachment to Existing Bridges or Structures or Wyoming Highway Department (WHD) Operating Policy No. 19-3, Right-of-Way Encroachments and Policy No. 19-8, Placement of Utilities on Bridges. Reduction of the pipeline diameter or line pressure would not meet the purpose of and need for the proposed project, which is to provide natural gas service that meets the needs of the Jackson area.

Alternative: Wildlife-Friendly Route (Not Shown in **Figure 2-1**)

Theme: Reduce the effects of pipeline construction and maintenance on wildlife habitats and populations.

Discussion: An alternative was considered that would route the proposed pipeline northeast from a tie-in to an existing pipeline to Highway 191 just north of Daniel, and then parallel Highway 191 past Bondurant to Jackson. Portions of this proposed route are included in the Hoback Junction and Snake River Route alternative, discussed above and dropped.

Rationale: The Hoback Junction and Snake River Route portion of the Wildlife-Friendly Route was dropped for the reasons stated above under the Hoback Junction and Snake River Route. The remainder of the Wildlife-Friendly Route alternative has been incorporated within the proposed action.

Alternative: Far from Highway Route (Not Shown in **Figure 2-1**)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor, WYDOT's activities, public safety, and wildlife habitats and populations along Fisherman Creek.

Discussion: An alternative was considered that would route the proposed pipeline far from the highway corridor and Fisherman Creek. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated. Portions of other alternatives, when considered together, would route the proposed pipeline far from the highway. The Muddy Creek Route, discussed above and dropped, would route the proposed pipeline far from Fisherman Creek. The Ramshorn Route, discussed above and dropped, would cross through the northern end of the Wyoming Range, from the Camp Davis area to the Noble Basin area. The East Bypass alternative, discussed above and dropped, would avoid the highway corridor from the LVE facility south of Jackson to the Game Creek area. The proposed pipeline has been routed away from the highway corridor through the Camp Creek Saddle area under the proposed action. The Kelly Route, considered above and dropped, also would route the proposed pipeline far from the highway corridor and Fisherman Creek.

Rationale: The Muddy Creek, Ramshorn, and Kelly Routes, and East Bypass portions of this alternative were dropped for the reasons stated above under each of these alternatives. The route segment through Camp Creek Saddle has been incorporated within the proposed action.

Alternative: Existing Roads in Elk Feedgrounds (Not Shown in **Figure 2-1**)

Theme: Reduce the effects of pipeline construction and maintenance on wildlife habitats and populations.

Discussion: An alternative was considered that would route the proposed pipeline along existing roads in elk feedgrounds.

Rationale: A portion of this alternative was dropped because it was not considered to be technically and economically feasible to construct the pipeline with many sharp bends to match the exact alignment of the existing roads. Some portions of the pipeline route through the elk feedgrounds were straightened to minimize surface disturbance and facilitate pipeline monitoring and maintenance. The remainder of this alternative has been incorporated within the proposed action.

Alternative: Avoid Jurisdictional Wetlands (Not Shown in **Figure 2-1**)

Theme: Eliminate the effects of pipeline construction and maintenance on jurisdictional wetlands.

Discussion: An alternative theme was considered that would route the proposed pipeline away from jurisdictional wetlands or require boring underneath all wetlands that could not be avoided. However, no feasible route was found that would completely avoid jurisdictional wetlands. Avoiding willow wetlands in the Beaver Creek area would require use of the Muddy Creek route (pages 2-5 to 2-6), which was dropped because it would traverse a roadless area, existing landslides, and unstable slopes. In mountainous terrain, the most accommodating topographic features for transportation routes and utilities are drainages, valleys, and basins that contain wetlands. Unless boring of wetlands in constricted canyons

or mountainous terrain is feasible, avoidance of wetlands is not likely to be possible, or if possible, would cause more resource disturbance. Boring of wetlands along the constricted pipeline corridor would require considerable extra working space and staging areas in order to complete the bore and install the pipeline. In all cases, the bore would be considerably longer than the wetland area and would disturb more land area. It would not be possible to bore a sequence of wetlands along the pipeline corridor given the topography and alignment constraints along the highway corridor.

Rationale: This alternative was dropped because it was not considered to be technically feasible to construct a pipeline by boring underneath the wetlands along the route. It would not be technically feasible to bore a sequence of wetlands because the pipeline could not be aligned, as designed, to minimize the impact on the highway corridor and other resource values, including the river corridor and heritage resources. In addition, access would have to be developed so that equipment could reach the additional work areas and staging areas in the intervening uplands between wetlands bore areas. These additional areas would also require additional surface disturbance. Increasing disturbance, including disturbance along the highway and river corridor, would likely not be in accordance with Forest Plan management guidance for visual resources and the Wild and Scenic corridor.

In addition, a shallow bore across wetlands would also be susceptible to the loss of drilling fluids through frac-outs and lost circulation that could introduce drilling muds containing bentonite to wetland areas. A frac-out or lost circulation in a wetland bore likely would affect water quality, subsurface hydrology, and wetland function. Restoration of subsurface flows and wetland function may not be possible if the frac-out or circulation loss cannot be sealed.

The pipeline route crosses multiple fault zones, including fractured thrust fault zones, which are highly susceptible to circulation loss. The risk associated with boring wetlands within the thrust belt and creating the potential for a frac-out, with lost drilling muds affecting water quality and aquatic habitat, was judged to be an unacceptable environmental impact during the design of the proposed pipeline.

No wetland crossings for the proposed pipeline, including willow wetlands on private lands in the vicinity of fault zones near the southeastern terminus of the pipeline route, would be located outside the thrust belt in more favorable rock units for boring; therefore, no wetland borings were planned during project design. When considering all potential effects of boring these wetlands, the potential adverse environmental effects that could result from boring instead of trenching in the rock types anticipated were judged to be an unacceptable environmental risk. Planned highway bores would not risk a frac-out underneath a river or stream channel.

2.2.1 Additional Consideration for Coordination with WYDOT Activities

An additional consideration, reducing the portion of the proposed pipeline route that would be located within 50 feet of the edge of the highway pavement along U.S. 189/191, has been evaluated for specific segments of the proposed route. These segments were identified by the Forest Service in a letter dated December 8, 2005, based on the agency's coordination efforts with WYDOT and LVE on November 4, 2005. One very short modification to the pipeline route that met the considerations for alternative design and coordination with WYDOT activities, WYDOT Reroute 1689+00, was incorporated within the proposed route, reducing the effects of pipeline construction and maintenance on the highway corridor and activities conducted by WYDOT and its contractors. A reduction in the length of the pipeline route that follows the highway corridor closely would facilitate highway maintenance activities. Less coordination involving WYDOT and LVE would be necessary during highway maintenance and WYDOT's concerns over potential conflicts with the pipeline would be mitigated.

2.2.2 Evaluation of Potential Reroutes

The rationale for not incorporating other WYDOT-recommended reroutes within the proposed route is provided below. The potential reroutes are described by theme, a discussion of the reroute, and the rationale for the environmental impact analysis and Forest Plan consistency recommendation regarding the reroute.

The Forest Plan for the BTNF contains visual quality standards that protect scenic views within the Wild and Scenic Rivers System corridor (W&S corridor) for the Hoback River, which is an eligible Recreation River, and along the Wyoming Centennial Scenic Byway (scenic byway), which includes U.S. 189/191. Foreground viewing areas within ¼ to ½ mile of the viewer must meet a visual quality objective (VQO) of retention along the W&S corridor and the scenic byway. Under a retention VQO, activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes should not be visually evident. Within the highway corridor, near the highway, the existing landscape incorporates linear disturbance areas that include the highway surface, shoulder, pullouts, ditches, signage and mile markers, and guard rails. The disturbance associated with the pipeline corridor would repeat existing visual elements (form, line, color, texture) in the highway corridor. If placed in this characteristic landscape, the pipeline corridor would meet a visual standard of retention. Placing the pipeline corridor in a seen area outside the linear, disturbed landscape associated with the highway would not meet a visual quality standard of retention.

Where the visual impacts resulting from construction of the pipeline along a potential reroute would not meet a visual quality objective of retention in foreground viewing areas along the Hoback River and the highway, the reroute would not meet applicable Forest Plan standards. Visual impacts must not be evident and VQOs of preservation or retention must be met in the foreground viewing zone of a ½-mile-wide corridor along the Hoback River under the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision). Also, the highway route through Hoback Canyon is designated as a sensitive travel corridor. A VQO of retention in the foreground and retention/partial retention in the middleground must be met in accordance with the Scenic Byway and Wild and Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision).

The proposed route closely parallels the linear disturbance associated with the highway corridor. Excavation requirements would be limited to achieving the required depth of burial for the pipeline. The effect on undisturbed areas would be limited. Within the highway corridor, near the highway, the existing landscape incorporates linear disturbed areas. Placing the linear pipeline corridor in this characteristic landscape would meet a visual quality standard of retention, as the pipeline corridor would not be visually evident to travelers and recreationists once reclamation is completed following construction activities.

Potential Reroute: WYDOT Reroute 1572+60 North and South Halves

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route to keep that portion more than 50 feet away from the edge of the highway pavement.

Discussion: This route modification would reduce the effects of pipeline construction and maintenance within the highway corridor used by WYDOT. This potential reroute would be located on the opposite side of the Hoback River from the proposed route and highway, and would affect undisturbed lands within the W&S corridor. Shoal Creek would be crossed under this potential reroute, but would not be

crossed under the proposed route. Two highway crossings would be eliminated by this reroute. Additional wetlands and riparian areas along Shoal Creek would be crossed by this potential reroute.

This potential reroute would cross sidehill slopes, produce visible scars, and require removal of forested vegetation. Additional excavation would be required to construct the pipeline along this reroute. Reclamation of disturbed areas along slopes can be difficult and prone to revegetation failure and excessive erosion. The northern portion of the reroute would be evident from the river, intermittently, and would also be intermittently visible from Kozy Campground and the highway. The reroute would be visually evident where it crosses Shoal Creek and other additional drainages, and would be visible along existing trails in the area. One crossing of the Hoback River would be moved by this reroute. The new crossing, near 1483, would likely be more visually evident than the currently proposed crossing near 1571. Placing the pipeline corridor in a seen area where it would consist of new disturbance in the W&S corridor, far outside the highway landscape characterized by linear disturbances, would not meet a visual quality standard of retention.

South of the confluence of Shoal Creek with the Hoback River, the Shoal Creek landslide is located west of the Hoback River and old landslide areas are located east of the river along the path of this potential reroute. The proposed route closely parallels the highway corridor, staying low in the canyon to reduce the effects of crossing potentially unstable slopes in a higher slope position. The potential reroute would be located in a higher slope position as it crosses old landslide deposits along both sides of Shoal Creek that were mapped by Plumley (2005). Sidehill excavation associated with construction of the pipeline or the concentration of water along the pipeline corridor might trigger movement within the landslide deposits. Reclamation of disturbed areas along hillslopes can be difficult and prone to revegetation failure and excessive erosion.

Rationale for Recommendation (Reroute Not Recommended): The visual impacts resulting from construction of the pipeline along this reroute would not meet applicable Forest Plan standards for the W&S corridor and the scenic byway. This potential reroute would create an intermittently visible scar from the construction of the pipeline and the retention of the pipeline corridor with herbaceous vegetation only (no shrubs or trees). Additionally, this reroute would require considerable new disturbance within the W&S corridor for the Hoback River and across old landslide deposits.

Potential Reroute: Reroute 1589+00 to 1600+00

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route to keep that portion more than 50 feet away from the edge of the highway pavement.

Discussion: This route modification would reduce the effects of pipeline construction and maintenance within the highway corridor used by WYDOT. This potential reroute would traverse up and over the hill between the two stations rather than following the road around, and would affect undisturbed lands. This potential reroute would require the removal of forested vegetation. The removal of forested vegetation within clearing limits that are likely to be 50 to 75 feet wide, and subsequent retention of a 20-foot wide pipeline corridor without shrubs or trees, would be visually evident to travelers and recreationists. The pipeline corridor for this reroute would be visible from the river and the highway at the locations where it diverges and rejoins the proposed route. Additional excavation would be required to construct the pipeline along this reroute. Reclamation of disturbed areas along slopes can be difficult and prone to revegetation failure and excessive erosion. The reroute would be evident from the river crossing at 1599, and would also be intermittently visible from other points along the river, Kozy Campground, and the highway. The reroute would be visible, intermittently, from existing trails in the area.

Placing the pipeline corridor in a seen area where it would require new disturbance outside the highway landscape characterized by linear disturbances would not meet a visual quality standard of retention.

Rationale for Recommendation (Reroute Not Recommended): The visual impacts resulting from construction of the pipeline along this reroute would not meet applicable Forest Plan standards for the W&S corridor and the scenic byway. This potential reroute would create an intermittently visible scar from the construction of the pipeline and the retention of the pipeline corridor with herbaceous vegetation only (no shrubs or trees). Additionally, this reroute would require considerable new disturbance within the W&S corridor and across old landslide deposits.

Potential Reroute: WYDOT Reroute 1716+30

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route to keep that portion more than 50 feet away from the edge of the highway pavement.

Discussion: This route modification would reduce the effects of pipeline construction and maintenance within the highway corridor used by WYDOT. This potential reroute would be located on the hillside 200 to 500 feet away from the highway corridor, with the highway corridor located between the pipeline corridor and the Hoback River. Although the reroute would parallel the highway, the pipeline corridor would be far enough away from the linear disturbance along the highway corridor that it would not blend in with the highway corridor and would be viewed as a separate disturbance. There would be direct views of the pipeline corridor along the hillside, as seen from the highway and the river. The pipeline corridor would also be visually evident from nearby trails within the W&S corridor that provide access to the Gros Ventre Wilderness. The removal of forested vegetation near Bull Creek within clearing limits that are likely to be 50 to 75 feet wide, and subsequent retention of a 20-foot wide pipeline corridor without shrubs or trees, would be visually evident to travelers and recreationists. Placing the pipeline corridor in a seen area, where it would constitute new disturbance outside the highway landscape characterized by linear disturbances, would not meet a visual quality standard of retention.

The potential reroute would also cross an active or potentially active landslide area between Cow Creek and Bull Creek that was mapped by Plumley (2005). The reroute would cross sidehill slopes, requiring additional excavation to construct the pipeline, which might trigger movement within the existing landslide area. Reclamation of disturbed areas along hillslopes can be difficult and prone to revegetation failure and excessive erosion.

Rationale for Recommendation (Reroute Not Recommended): The visual impacts resulting from construction of the pipeline along this reroute would not meet applicable Forest Plan standards for the W&S corridor and the scenic byway. This potential reroute would create an intermittently visible scar from the construction of the pipeline and the retention of the pipeline corridor with herbaceous vegetation only (no shrubs or trees). Additionally, this reroute would cross an active or potentially active landslide area mapped by Plumley (2005) and would require considerable new disturbance within the W&S corridor for the Hoback River.

Potential Reroute: WYDOT Reroute 1791+50

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and

WYDOT's activities by realigning a portion of the proposed pipeline route to keep that portion more than 50 feet away from the edge of the highway pavement.

Discussion: This route modification would reduce the effects of pipeline construction and maintenance within the highway corridor used by WYDOT. This potential reroute would be located at the foot of the hillslope on the opposite side of the Hoback River from the current proposed action and the highway. The proposed reroute would affect undisturbed and previously disturbed lands, including an old road bed and an existing trail within the W&S corridor. Although the reroute would parallel existing disturbed areas along the river corridor, the pipeline corridor would be clearly visible from some points along the river and the highway. The pipeline corridor would also be visually evident from nearby trails within the W&S corridor that provide access to the Gros Ventre Wilderness. The removal of vegetation within clearing limits that are likely to be 50 to 75 feet wide at the proposed river crossing near 1768, and subsequent retention of a 20-foot wide pipeline corridor with no shrubs or trees, would be visually evident to travelers and recreationists. Placing the pipeline corridor and river crossing in a seen area where it would require new disturbance in the W&S corridor, outside the existing highway landscape characterized by linear disturbances, would not meet a visual quality standard of retention.

Moving the proposed river crossing to Red Creek (near 1779) would affect forested vegetation and leave a visual scar. Disturbance would be visually evident from the 4WD trail along Red Creek and would create new disturbed area in the W&S corridor that would be visually evident from the river. Moving the river crossing to a seen area requiring new disturbance in the W&S corridor, outside the existing highway landscape characterized by linear disturbances, would not meet a visual quality standard of retention.

The proposed river crossing associated with WYDOT's proposed reroute (near 1768) would cross an extensive old landslide area mapped by Plumley (2005). The river crossing would require excavation in the landslide area to construct the pipeline, which could affect slope stability in the vicinity of the crossing. Moving the proposed river crossing to the vicinity of Red Creek (near 1779) would avoid the old landslide area.

Rationale for Recommendation (Reroute Not Recommended): The visual impacts resulting from construction of the pipeline along this reroute would not meet applicable Forest Plan standards for the W&S corridor and the scenic byway. This potential reroute would create an intermittently visible scar from the construction of the pipeline and the retention of the pipeline corridor with herbaceous vegetation only (no shrubs or trees). Applicable Forest Plan visual quality standards would not be met for this reroute regardless of which river crossing is proposed (near 1768 or 1779). Additionally, the proposed river crossing associated with WYDOT's reroute (near 1768) would cross an old landslide area (Plumley 2005). This reroute, with either proposed river crossing (near 1768 or 1779), would require new disturbance within the W&S corridor.

Potential Reroute: WYDOT Reroute 1879+80 (1830 to 1880)

Theme: Reduce the effects of pipeline construction and maintenance on the highway corridor and WYDOT's activities by realigning a portion of the proposed pipeline route to keep that portion more than 50 feet away from the edge of the highway pavement.

Discussion: This route modification would reduce the effects of pipeline construction and maintenance within the highway corridor used by WYDOT. This potential reroute would be located on the hillside 200 to 600 feet away from the highway corridor, with the highway corridor located between the pipeline corridor and the Hoback River. Although the reroute would parallel the highway, the pipeline corridor would be far enough away from the linear disturbance along the highway corridor that it would not blend

in with the highway corridor and would be viewed as a separate disturbance. There would be direct views of the pipeline corridor along the hillside as seen from the highway, Hoback Campground, and the river. The pipeline corridor for this reroute would be evident from the river and the highway at the locations where it diverges and rejoins the proposed route. The pipeline corridor would also be visually evident from nearby trails within the W&S corridor that provide access to the river and the Gros Ventre Wilderness. The removal of vegetation near 1880 and subsequent retention of a 20-foot wide pipeline corridor without shrubs or trees would be visually evident to travelers and recreationists. Placing the pipeline corridor along this reroute in a seen area outside the highway landscape characterized by linear disturbances would not meet a visual quality standard of retention.

Plumley (2005) mapped landslide features along the proposed pipeline route. An old landslide area encompasses the area affected by this potential reroute. In addition, the potential reroute would cross an active or potentially active landslide area within the old landslide area. The proposed route closely parallels the highway corridor, staying low in the canyon to reduce the effects of crossing potentially unstable slopes in a higher slope position. The potential reroute would be located in a higher slope position as it crosses the landslide area. The reroute would cross sidehill slopes above the proposed route, requiring additional excavation to construct the pipeline which might trigger movement within the landslide area. Reclamation of disturbed areas along hill slopes can be difficult and prone to revegetation failure and excessive erosion.

Rationale for Recommendation (Reroute Not Recommended): The visual impacts resulting from construction of the pipeline along this reroute would not meet applicable Forest Plan standards for the W&S corridor and the scenic byway. This potential reroute would create an intermittently visible scar from the construction of the pipeline and the retention of the pipeline corridor with herbaceous vegetation only (no shrubs or trees). Additionally, this reroute would cross an active or potentially active landslide area mapped by Plumley (2005) and would require considerable new disturbance within the W&S corridor.

2.3 ALTERNATIVES, INCLUDING THE PROPOSED ACTION AND NO ACTION

2.3.1 Alternative A - No Action

Theme: No Action

Overview: Under the No Action alternative, a natural gas pipeline would not be constructed to bring natural gas service to the Jackson, Wyoming area (**Figure 2-2**).

Components: The application for a special use authorization for the construction, operation, and maintenance of a natural gas pipeline submitted to the Forest Service by Lower Valley Energy (LVE) would not be approved. A natural gas pipeline would not be constructed to bring natural gas service to the Jackson, Wyoming area from a location near Merna, Wyoming. Long-term supplies of natural gas to meet the needs of LVE's customers in the Jackson area would not be acquired by a connection to an existing gas pipeline in the Merna area. The Jackson area would continue to be supplied with liquid natural gas (LNG) by tanker trucks traveling on public highways. Currently, an estimated 500 round trips by tanker trucks along public highways occur annually. Round trips by tanker trucks are anticipated to increase within the next 5 years to 600 round trips annually along public highways.

Figure 2-2 Alternative A - No Action

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Description of Activities: The No Action alternative consists of the following activity: hauling of LNG by tanker truck on public highways that cross NFS lands.

Timeline: Activities under the No Action alternative are ongoing and arrangements to continue the use of tanker trucks to bring LNG to Jackson on a long-term basis would be implemented immediately.

Discussion: Under the No Action alternative, long-term supplies of natural gas to meet the needs of LVE's customers in the Jackson area would not be supplied by producing gas fields near Merna or elsewhere in Sublette County. The Jackson area would not be supplied with a steady stream of natural gas by pipeline.

The No Action alternative would involve no change to the current gas supply for Jackson, Wyoming. The current gas supply for LVE's distribution system is an LNG facility located adjacent to its Jackson, Wyoming office. Tanker trucks currently transport LNG from the Shute Creek facility, located south of La Barge, Wyoming, to LVE's facility.

Delivery of LNG to the Jackson area requires that trucks travel approximately 120 miles (one way) on public highways (U.S. highways 287/191/26 and 89/191) on a daily basis. From 2000 to 2003, the number of round trips by tanker trucks steadily increased from 392 to 492 round trips per year. Approximately 665 round trips per year by tanker trucks are projected by 2010. Each tanker truck carries approximately 10,000 gallons of LNG, which is equivalent to approximately 830,000 standard cubic feet (cf) of natural gas.

In addition to LNG, residences and businesses in the Jackson area would continue to rely on a variety of energy resources that include hydropower, coal-burning power plants, wind power, liquid propane (LP), fuel oil, wood burning, and solar power. LP and fuel oil are also trucked into the Jackson area from other areas in Wyoming.

Rationale: Regulations require that a No Action alternative be analyzed as a baseline against which the effects of any action alternatives can be measured or compared.

2.3.2 Alternative B - Proposed Action

Theme: Provide a steady stream of natural gas to Jackson, Wyoming by pipeline

Overview: Under the Proposed Action, the Forest Service would approve an application for a special use authorization submitted by LVE. A natural gas pipeline would be constructed, operated, and maintained by LVE to bring natural gas service (processed and odorized gas) to the Jackson, Wyoming area from a tie-in to an existing gas pipeline near Merna, Wyoming (**Figure 2-3**). The locations of five proposed manual mainline isolation valves (intermediate block and check valves) are listed in **Appendix D**. A small gas processing facility would be constructed on private lands in the vicinity of U.S. 189/191 in Section 24, T. 36 N., R. 112 W. (**Figure 2-3**).

Long-term supplies of natural gas to meet the needs of LVE's customers in the Jackson area are available in northern Sublette County. A connection to an existing gas pipeline in the SW1/4NW1/4 of Section 34, T.36N. R.112W. would give LVE the ability to provide gas directly to the Jackson area from producing fields near Merna or farther south in Sublette County. The proposed pipeline would tie directly into LVE's LNG facility in Jackson (NE1/4NE1/4 of Section 20, T.40N., R.116W.). The proposed project would deliver processed and odorized natural gas to the Jackson area for distribution to LVE's customers.

Components: The Proposed Action consists of the following components: natural gas pipeline; gas processing facility; existing road access; water use; and workforce.

Natural Gas Pipeline

LVE proposes to construct a natural gas pipeline that would provide a steady stream of natural gas to the Jackson area, greatly reducing the need for trucking LNG along public highways. The existing LNG facility located adjacent to LVE's Jackson, Wyoming office would be maintained as a backup gas supply system, requiring fewer than 50 round trips per year by tanker trucks to maintain LNG storage bullets.

The Proposed Action includes the design, construction, operation, and maintenance of a pressurized natural gas pipeline that would be 49.7 miles long. The proposed pipeline would be located on lands administered by the Forest Service, State of Wyoming lands, and private lands. About half of the pipeline route (25.4 miles) would be located on NFS lands administered by the Bridger-Teton National Forest. The size of the new steel pipeline would be 6 inches in diameter, with an outside diameter of 6.625 inches and no larger. The operational pressure of the proposed pipeline would range between 60 and 300 psi, with an average system pressure of around 200 psi. The system would typically be run at a lower pressure during the summer based on demand. The pipeline would be designed, constructed, and operated by LVE in accordance with U.S. Department of Transportation (DOT) Pipeline Safety Regulations contained in (Title) 49 of the Code of Federal Regulations (CFR). The Office of Pipeline Safety (OPS) regulations in 49 CFR Parts 190-199 contain federal pipeline safety regulations that assure safety in design, construction, inspection, testing, operation, and maintenance of natural gas pipeline facilities.

At five locations along the pipeline route, mainline isolation valves (block valves) would be placed so that the flow of gas through the pipeline could be stopped to isolate a segment of the pipeline system. These block valve locations are listed in **Appendix D**. The estimated footprint of each valve location would be 6 feet wide by ten feet long, and about 30 inches in height above ground level.

Gas Processing Facility

A small gas processing facility (Rim Station) would be constructed on private lands in the vicinity of U.S. 189/191 near the southern end of the pipeline route in Section 24, T. 36 N., R. 112 W. This facility would occupy a small site, less than 1 acre in size. It would be designed using best available control technology (BACT) and would include a glycol dehydration unit and a small natural gas-fired air compressor to inject air into the gas stream. The gas would be odorized at this location so that LVE customers along the pipeline route can receive gas that is ready for use. Once the gas is odorized and ready for delivery to customers, raw, unprocessed gas could not be added to the pipeline directly from a well tie-in.

Figure 2-3 Alternative B - Proposed Action

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Existing Road Access

Existing public roads identified in **Table 2-1** and private roads would provide access to the pipeline construction corridor. No temporary or permanent roads would be constructed in association with the proposed pipeline. LVE is contacting all affected landowners, completing surface use agreements, and executing easements and letters of authorization, as appropriate. Improvements, upgrades, or modifications to existing roads would not be required for construction of the project. However, access roads would be repaired and maintained as needed to pre-construction conditions.

Construction traffic would be limited to designated existing access roads and the pipeline construction corridor. In locations where the pipeline route deviates from existing road corridors, personnel, equipment, and materials would be transported along the pipeline construction corridor. Any turnaround areas needed would be identified as temporary work areas (TWAs) during preconstruction surveys. Designated access roads that would be used during construction activities are listed in **Table 2-1**. Proposed use is described in **Appendix D**.

TABLE 2-1 DESIGNATED ACCESS ROADS

Road or Highway	Surface Ownership
U.S. 89/191	Private, State of Wyoming
U.S. 189/191	Private, National Forest
Game Creek Road (FDR 30455)	Private, National Forest
Granite Creek Road (FDR 30500)	National Forest
Cliff Creek Road (FDR 30530)	National Forest
FDR 30686	National Forest
FDR 30461	Private, National Forest, Wyoming Game and Fish

Water Use

Non-consumptive water use would be required for hydrostatic testing of the installed pipe. Consumptive water use would be required for dust abatement. Approximately 4 acre-feet would be withdrawn from the Hoback River or obtained from another source in the Hoback River watershed for dust abatement, and 2 acre-feet would be withdrawn from the Hoback River or obtained from another source in the Hoback river watershed for hydrostatic testing. All water use would be authorized through a Water Use Agreement with the Wyoming State Engineer and negotiations with water rights owners. The management, testing, and criteria for discharge water are described later in the Hydrostatic Testing section.

The proposed pipeline route would cross a number of sensitive resource areas, including waters of the U.S. (streams and wetlands), State of Wyoming wildlife management areas, other wildlife habitats, and recreation areas. Effects on protected natural and scenic resources in Teton County would be evaluated and mitigated, as appropriate. For pipeline installations across streams or wetland areas, the pipe would be installed in accordance with U.S. Army Corps of Engineers permit requirements.

Workforce

LVE estimates that 150 to 200 workers would be needed to install the pipeline and ancillary facilities over a 6-month period. The work force would consist of equipment operators, pipe fitters, welders, truck drivers, laborers, and quality assurance and safety inspectors. No new permanent employment positions would be created for the project operations. Existing employees would perform the long-term operations and maintenance requirements of the pipeline and ancillary facilities. Existing employees reside in the surrounding area and are within commuting distance of the project.

Description of Activities: The Proposed Action consists of the following activities: pre-work conference; pre-construction staking; construction activities; pipeline installation; hydrostatic testing; reclamation; and operation and maintenance.

Pre-Work Conference

Prior to beginning field work associated with project implementation, representatives of LVE and its contractors would meet with the Forest Service to review the construction plans. The purpose of this conference would be to ensure that the project decisions made by the Forest Service, including design criteria, implementation standards, and monitoring requirements, are clearly understood by all.

Pre-Construction Staking

LVE or its contractors would stake the centerline of the pipeline, the limits of the pipeline construction corridor, the limits of TWAs, and the gas processing facility site. Global positioning system (GPS) reference points would be established for the pipeline centerline and the other project components (access roads, valves, gas processing facility site). All construction disturbance would be confined to the limits of approved construction work areas.

The “one call” service would be initiated to notify all utility operators of the pending construction and locate below-ground utilities. Existing buried utilities would be clearly identified (flagged or staked) to ensure that they are not damaged. Appropriate signage would be placed to identify designated access roads and setbacks for construction activities near sensitive resources.

Construction Activities

After the pipeline centerline is staked, temporary wire gates would be installed at all crossings of landowner fence lines. The temporary gates would provide easy access along the construction corridor for movement of construction workers, equipment, and materials needed for excavation of the trench and pipe installation. Functional use of all livestock facilities and other public improvements would be maintained at all times. Fences would be adequately braced along both sides of the construction corridor before wires are cut and temporary gates installed. After construction, openings would be closed with fencing of the same specifications as the original. In some locations, temporary fencing may be installed, with landowner permission, to reduce conflicts between livestock and construction activities, or, permanent gates may be installed, with landowner permission, to provide access to the pipeline for maintenance. If a natural barrier used for livestock control is damaged during construction, the area would be adequately fenced to prevent the escape of livestock. No gates on established roads over public lands would be locked or blocked. Any cattleguards or gates damaged would be repaired or replaced.

The pipeline would be constructed in a continuous operation known as a spread, consisting of equipment and crews handling various phases of construction activities. The construction spread would consist of a mainline pipeline crew (100 to 150 workers), a crossing crew for road crossings, river crossings, and wetlands crossings (20 workers), and a Hoback Canyon crew (30 workers).

Equipment and vehicles used during mainline construction activities would include about 20 pieces of heavy-duty equipment (including excavators, backhoes, dozers, graders, loaders, sidebooms, equipment haulers, cranes, dump trucks, tack rigs, fuel and water trucks, and personnel carriers), 10 medium-duty trucks, and 20 light-duty vehicles. Equipment and vehicles used by the Hoback Canyon crew would include about 10 pieces of heavy-duty equipment (including backhoes, graders, loaders, sidebooms, equipment haulers, dump trucks, and a street sweeper), four medium-duty trucks, and four light-duty vehicles. Equipment and vehicles used by the crossing crew would include about six pieces of heavy-duty equipment (including excavators, backhoes, loaders, sidebooms, equipment haulers, and dump trucks), two medium-duty trucks, and two light-duty vehicles.

Construction activities would include clearing and grading, excavation, pipe installation (including stringing, pipe bending, welding, joint coating, lowering-in, padding, and backfilling), hydrostatic testing, and reclamation (including revegetation and cleanup). A brief description of the various construction activities is provided in the paragraphs that follow.

Standard pipeline construction techniques would be employed for installation of the pipeline. Design criteria for the proposed project are presented in detail in **Appendix D**. Generally, a 75-foot-wide construction corridor would be used for installation of the pipeline on NFS lands.

TWAs that extend beyond the edge of the construction corridor would be used at specified locations along the pipeline route for construction activities requiring additional work space, including road, wetland, and stream crossings; excavation in areas with steep side slopes; and installation of mainline valve sites. TWAs would be used for stockpiling materials and spoils, staging pipe, excavating larger trenches or bell holes, and moving equipment. Special space-saving construction techniques would be used in the Hoback Canyon area where the canyon is constricted or the pipeline would be located near the highway clear zone. Spoils would be trucked to nearby TWAs where enough space would be available for storage. Project requirements for TWAs are described in **Appendix D**.

Other TWAs would be needed for pipe storage, equipment lay-down, contractor mobilization and demobilization, and organization of construction personnel. These areas would be located away from the pipeline construction corridor and streambanks, in the Bondurant area, Granite Creek area, and Cliff Creek area, as shown in **Appendix D**. All would be accessible from existing roads.

Normal pipeline construction begins by installing sediment control structures, removing topsoil, and clearing and grading a pipeline construction corridor to prepare a smooth and unobstructed work pad for succeeding construction operations. Trees that must be removed would be cut to ground level and stumps would be removed from the trench line and working areas for safety reasons. Cut trees would be temporarily stockpiled along the edge of the construction corridor or in a TWA for disposal, as directed by the Forest Service or affected landowner.

Topsoil would be stripped from the portion of the construction corridor and TWAs that would be affected by surface disturbing activities, including soil compaction, and conserved for replacement after pipeline construction is completed. Salvaged topsoil would be stockpiled on the non-working side of the construction corridor, where possible, or in TWAs. The degree of grading necessary is a function of the roughness of the terrain. For most of the proposed pipeline route, clearing and grading would be a simple operation with minimal cuts or fill required. The timing between clearing and trenching would require the construction corridor to be cleared a short time ahead of trenching. Where appropriate, brush beating would be considered as an alternative to grading in certain areas.

Grading would be conducted in a manner that minimizes interference with existing natural drainage. Temporary crossings would be constructed across creeks and gullies, as needed. In mountainous or hilly terrain where the slope runs across the construction corridor, a level work pad must be cut out of the hillside; this technique is referred to as a sidehill cut. Grading for sidehill cuts begins at the uphill end of the cuts and continues downward until the required working width is obtained. Spoil from the cut (uphill) is graded to fill the opposite (downhill) side of the bench where it forms part of the work pad, thereby minimizing the width of disturbed area. The slope of the cut (as well as the fill on the opposite side) depends on the angle of repose of the material being graded. The looser the material, the smaller the angle of repose and the larger the cut required for a given work pad width. Following construction, the fill material would be placed in the cut and the terrain contoured to its original condition during reclamation.

Once the working area is prepared, the trenching operation would begin. The trench would be excavated along the established pipeline alignment. Trenching typically proceeds ahead of other construction

activities. Normal trenching uses a backhoe or excavator to remove subsoil. Trench spoils would be stored adjacent to the trench where topsoil has been stripped, but would be segregated from the topsoil. In some cases, TWAs may be necessary for storage of large amounts of spoils.

The width and depth of the trench would vary according to the materials and conditions encountered. Over most of the route, the excavated trench would be about 2 to 3 feet wide and 4 feet deep. The depth of burial would be 48 inches (4 feet) where the centerline of the pipeline trench is within 50 feet of the highway pavement. The trench would be 6 feet deep in specific locations where there is a likelihood of increased WYDOT maintenance and construction activity, such as near guardrail posts at the ends of existing bridges. LVE and WYDOT would coordinate the specific limits of where increased burial is justified because of the potential for WYDOT activities to penetrate to the level of the pipe. These locations will be identified on the final construction plans for the pipeline. In wetland areas, the excavated trench would be about 3 to 4 feet wide and 4 to 5 feet deep. At river crossings, the excavated trench would be about 4 to 5 feet wide and 6 feet deep.

The open trench would be free of rocks, hard clods, roots, or other debris, which could damage the coated pipe when it is lowered into the trench. The bottom of the trench would be graded and dressed so that the pipe would have a continuous and uniform bearing. Some areas may have shallow soil underlain by bedrock or bedrock may be exposed at the surface. Where loose rock is encountered, a ripper may be used ahead of the excavator. Blasting or mechanical breakage would be required in areas that cannot be excavated or ripped by conventional means.

Removal of solid rock from the trench may require the use of a hydraulic chisel, a rock saw, or blasting. If blasting is necessary, landowners would be notified in sufficient time to protect livestock and property. Extra precautions would be taken when blasting near the highway, telephone or electrical conduits, water lines, wells, pipelines, or other underground structures.

Unexcavated portions of the trench line would be spaced at suitable intervals, as requested by the Forest Service or landowners, to allow passage of vehicles, livestock, and wildlife across the open trench. Gaps would also be left in the spoil and topsoil piles across drainages to accommodate surface water runoff.

The trench would typically remain open for several days to a week until the pipe can be lowered in and the trench backfilled. Where an open trench would interfere with livestock trails, driveways, or rural roads, temporary fences and crossings such as plank bridges would be provided to allow safe and unobstructed passage across the construction corridor. Trenches along the highway corridor would be backfilled or covered by a steel plate during times when the construction corridor is unattended.

Sediment and erosion control measures would be employed to minimize erosion and sediment transport in the open trench. Trench breakers, sacks filled with sand or smooth spoil, would be constructed in the open trench in areas of sloping terrain to reduce sediment transport and prevent runoff from channeling. If trench dewatering becomes necessary, water would be discharged onto the ground where existing vegetative cover can dissipate flows or into an appropriately designed dewatering structure, in accordance with stormwater management plan requirements of the Wyoming Department of Environmental Quality (WDEQ).

Trenching would be used for all sections of the pipeline except highway crossings and a 1,500-foot section of pipeline near Camp Creek Saddle. Horizontal boring or drilling techniques or open cuts would be used at highway crossings, as described below. About 1,500 feet of pipe would be coated for protection and laid on the surface in an active landslide area near Camp Creek Saddle.

Road and Highway Crossings - All road crossings would be constructed in compliance with the crossing requirements of the appropriate state and local agencies. All public road crossings would be installed following the permitted engineering drawings and specifications at locations listed in **Appendix D**. Road crossing installations would be open-cut or bored, depending on the site-specific requirements of the appropriate regulatory agency, and considerations for public safety, stability of slopes and embankments, and limiting visual intrusion along the scenic byway. Crossings would be uncased.

Crossings of unpaved roads would be open-cut and completed in 1 day. Open-cut installations would be backfilled and compacted to a specified density equal to that of the surrounding undisturbed earth at a minimum. After backfilling, the surface of the road would be replaced as specified in applicable permits.

Federal and state highway crossings would be installed using horizontal boring or drilling techniques or open cuts, in accordance with Wyoming Highway Department requirements. Where the pipeline crosses beneath the highway, the elevation of the pipe for the crossing will match the elevation of the pipe at either end of the crossing. The depth of the borings at highway crossings will be sufficient to address bedrock, groundwater, an adjacent structure, or an embankment is encountered that prevents or limits use of a bore pit. The resolution of any problems encountered would be determined in consultation with WYDOT and the Forest Service. The boring procedure would require the excavation of a bore pit, up to 15 feet by 50 feet total in size, for placement of the boring machine. The pipe would be pushed under the road by the boring machine as the borehole progresses. Once the pipe is installed, the bore pits would be backfilled and compacted in accordance with permit specifications. Road bore installations would generally be completed in 3 to 5 days.

At road crossings, safety measures would be used, as needed. Measures would include flagmen, barriers, warning signs, lights, and walkways around the work area. Roads would remain passable with traffic control, or a suitable bypass road would keep traffic moving. Traffic flow would be maintained where the pipeline would be installed by open-cut under a paved road surface. Steel plates would be installed at the end of the work day. All road surfaces would be kept free of debris that could be a hazard to the public.

Stream and River Crossings - The proposed pipeline would cross the Hoback River and other perennial or intermittent streams located along the route. The project would require nine crossings of the Hoback River one crossing of Cliff Creek, a perennial stream, and one crossing of the Upper Hoback River. The locations of all stream and drainage crossings are specified in **Appendix D**. These crossings would be installed by open-cutting the river or stream during low flow and burying the pipeline. The width of the construction corridor would be reduced at stream crossings. Crossings would not occur any closer than 50 feet away from highway bridges.

The river and stream crossings have been aligned to minimize impacts on riparian and wetland vegetation. Vegetation would be cleared on each streambank only as needed to provide adequate work space. Open-cut crossings would be accomplished using conventional open-bucket excavation equipment (track-mounted backhoe) operating from each stream bank, equipment bridges, or instream. Equipment would operate instream only where the width of the crossing exceeds the reach of the equipment and equipment would be limited to that needed to construct the crossing. Streambanks would be restored to preconstruction elevations and cross-sectional profile, and stabilized within 24 hours of completing instream activities. Temporary sediment barriers would be installed at the edges of banks and maintained until adjacent upland disturbance areas have been successfully restored. Instream construction activities, such as excavation, pipe installation, backfill, and streambed restoration, would typically be completed at a crossing within 48 hours. Gravel, cobble, and boulder-size material from the river channel would be segregated and then replaced selectively, as directed in applicable permits. Revegetation efforts would be initiated as soon as practicable.

Wetland Areas - Procedures for construction in wetland areas would be determined by the type of wetland encountered, the length of the crossing, and the level of soil saturation. Open-cut stream crossing procedures would be used for channeled surface flows encountered in wetland areas. In wetland areas, sediment barriers would be installed immediately upslope of the wetland to minimize effects on any adjacent wetlands. Woody vegetation in wetlands would be cleared using the least disruptive method. Herbaceous vegetation would not be removed except immediately over the trench line or in rough or broken terrain. Topsoil would not be stripped from the construction corridor except over the trench line and where required to prepare a level work surface for pipe-laying equipment. Spoil material and topsoil from the trench would be segregated within the construction corridor. If standing water and unstable soils interfere with construction, the trench may be dewatered by pumping. Trench water would be disposed of in accordance with the WDEQ regulations. In saturated wetlands, soils would be protected from traffic impacts by using timber mats or other supportive material. Temporary fill would not be brought into the wetland to stabilize the working area. After the pipe is installed, the trench would be backfilled and the topsoil replaced. No crown would be left over the trench. The salvaged topsoil would be reapplied to the areas from which it was stripped to maximize reclamation success. Revegetation efforts would be initiated as soon as practicable.

Camp Creek Saddle Landslide Area - The pipeline would be installed on the ground surface for a distance of about 1,500 feet through the Camp Creek Saddle landslide area. Surface installation of the pipe would allow any landslide movement that may occur to be directed under the pipeline. A site-specific monitoring program and contingency plan for intervention would mitigate potential damage to the pipeline in the slide area. This monitoring program would include regular visual inspection and strain gauge monitoring of the slide area to track earth flow movements. Typical intervention would include excavating the pipeline to free the pipe of impinging soil mass or taking the pipeline temporarily out of service to readjust the pipe and relieve strain. Details of the monitoring program and contingency plan are included in **Appendix D**.

Pipe Installation

The pipe lengths would be strung end-to-end in the construction corridor in preparation for bending and welding. Stringing may precede trenching in areas not requiring blasting. Pipe would be strung in a manner that would not block passage of vehicles or livestock.

Pipe preparation would start with a bending engineer measuring the angles and tangents of the trench and calculating the required bend degree and orientation required for each length of pipe. This operation would ensure that the pipeline fits the contours of the trenchline with sufficient slack for expansion and contraction when welded together and placed in the trench. An equipment operator would place the pipe length in a bending machine, form the bend, and then return the pipe to its proper space for welding.

The welding crew would prepare and align the bent pipe sections and complete welding in two operations; first, completing the stringer bead and the hot pass, and second, completing the filler beads and cap. Welders would take all precautionary measures to reduce the chance of igniting a fire by placing a fire-resistant mat on the ground below welding and grinding operations whenever vegetation is present. All welds would be visually and radiographically inspected and repaired as necessary.

After the pipe has been welded and radiographically inspected, shrink sleeves or other appropriate coating materials would be used to protect each welded joint. Before the assembled pipe is lowered into the trench by side-boom tractors, all pipeline coating at all field joints, fittings, and bends would be inspected (jeeped) for faults or voids and repaired as necessary. In addition, the pipeline may be wrapped with rock shield or other appropriate material to protect the pipe and coating in rocky areas.

Spoil material would be used to cover the pipe and backfill the trench. Trench spoils may be backfilled directly into the trench in areas where the spoils are composed of soft and loose earthen material, and free of rocks and hard clods. In rocky areas, padding would be used to cover and protect the pipeline and coating from rocks. Padding material would consist of either original trench spoils that have been screened to be free of rock or imported rock-free fill material. Topsoil would not be used as padding or backfill material and would remain protected and segregated during backfilling operations. The pipeline would be covered with a minimum of 6 to 12 inches of padding before any hard objects are placed in the trench. After padding has been completed, the remaining trench would be backfilled to ground level and the backfill would be compacted by equipment.

In sloping terrain, sacks filled with sand or smooth soil would be placed in the trench at intervals, perpendicular to the pipe, to serve as barriers that prevent water from running down the trench during rain storms and washing out the backfill. When these preparations are completed, the trench containing the pipe and sack breakers (as needed) would be backfilled with spoil excavated from the trench. After the backfill compaction, a berm or crown approximately 8 inches high at the center may be left over the trench line to compensate for natural backfill subsidence. Crowns would not be constructed across drainages and wetlands. After backfilling is completed, topsoil would be replaced over the disturbed area.

The pipeline would be buried, except at the following locations: a 1,500-foot section of the pipeline near Camp Creek Saddle that crosses an active landslide; all locations where block and check valves are placed; and at the gas processing facility. Where below ground, the pipeline would be buried to a depth that meets or exceeds DOT regulations. In upland areas, the minimum cover (between the top of the pipe and ground level) would be 36 inches in soils and 18 inches in consolidated bedrock. In wetland areas and at stream crossings, the minimum cover would be 48 inches in soil and 18 inches in bedrock. The minimum depth of burial would be 48 inches (4 feet) where the centerline of the pipeline trench is within 50 feet of the highway pavement. The trench would be 72 inches (6 feet) deep in specific locations where there is a likelihood of increased WYDOT maintenance and construction activity, as agreed to by LVE and WYDOT. Where the pipeline crosses beneath the highway, the elevation of the pipe for the crossing will match the elevation of the pipe at either end of the crossing. Minor field modifications of the design needed to reduce environmental effects would be determined in consultation with WYDOT and the Forest Service, and would be documented in the Forest Service authorization for the pipeline.

Hydrostatic Testing

Once the pipe is in place, the system would be tested with pressurized water to locate any leaks or weak spots. The test water would be obtained from the Hoback River or other sources through a Water Use Agreement with the State Engineer and negotiations with water rights owners. Test water would likely be reused in testing each section of the pipeline. In all, approximately 2 acre-feet of water would be required for testing. After testing is completed, the test water would be discharged to WDEQ-authorized outfalls on the Hoback River, designed in accordance with all federal, state, and local requirements and best management practices (BMPs) for protection of water quality and stream flows. No rust inhibitors would be added to the test water, and the water discharged would only contain minor amounts of sediment and iron oxide from the weld areas. The discharge rate would be regulated, and appropriate BMPs would be used to prevent erosion, streambed scour, suspension of sediment, and excessive streamflow. Discharge water samples would be collected and analyzed in accordance with Wyoming Pollutant Discharge Elimination System (WYPDES) permit conditions established by WDEQ.

The completed pipeline would likely be hydrostatically tested in three test sections. During the hydrostatic test, a test section would be filled with fresh water from authorized intake points. Test water would be hauled by truck from the intake point and transferred to the pipeline. Once the test section is filled, the pipe would be pressurized to at least 125 percent of the maximum allowable operating pressure

(MAOP) for that section and tested for a minimum of 8 hours. If leaks are detected during the test, defective pipe sections would be replaced and the section would be retested until specifications are met. In order to minimize water use and discharge impacts, the test water would be moved from the tested section to other sections for reuse during subsequent tests.

Reclamation

The overall reclamation objective is to restore the area to the general appearance, including vegetative and hydrologic conditions, existing prior to the installation of the pipeline. However, a 20-foot-wide permanent pipeline corridor would be maintained in an herbaceous state, without shrubs or trees. Roots of trees or shrubs could potentially damage the protective coating of the steel pipe. Best management practices (BMPs) and Forest Plan standards and guidelines provide the basis for the reclamation plan for the project. Extensive project design criteria in **Appendix D** have been developed to meet reclamation objectives, including recontouring, drainage and erosion control, revegetation, restoration of river and stream channels and banks at crossings, and restoration of wetland function in affected areas.

The final phase of pipeline construction consists of cleanup and reclamation of disturbed areas. All construction equipment, materials, and debris would be removed from the work areas. Cut trees would be disposed as directed by the landowner/authorizing agency. Excavated rock would be applied to the construction corridor at a size and density similar to nearby conditions. Large or excess rock would be hauled to an approved landfill or disposed of as directed by the landowner. Landowner fences cut or removed during construction would be repaired or replaced in accordance with landowner agreements.

TWAs and the 75-foot pipeline construction corridor would be reclaimed to pre-construction conditions, except as follows. The portion of the construction corridor containing the pipeline (a 20-foot-wide area) will be revegetated with herbaceous vegetation only (no shrubs or trees), and would serve as a maintenance corridor during pipeline operations. Trees and shrubs would be excluded from the 20-foot-wide permanent pipeline corridor to facilitate aerial inspection of the pipeline corridor, and because their roots could potentially damage the protective coating of the steel pipe.

Following the completion of backfilling, remaining spoils would be spread across all disturbed areas and elevations would be restored to as near the natural grade as practicable. Excess spoils remaining after regrading would be removed from the construction corridor and disposed of in an area acceptable to the landowner and in accordance with regulatory agency requirements.

Once recontouring has been completed, subsoil compaction of work areas would be reduced by ripping, discing, or chisel plowing, unless otherwise directed by the landowner. This procedure would be completed prior to replacement of topsoil across the disturbed surface. Prior to topsoil replacement, excess rock on the surface would be removed and disposed of at an approved location or as directed by the landowner.

Topsoil would be redistributed across regraded areas of the construction corridor, prepared for revegetation, and left in a roughened condition to minimize the erosive effects of water and wind. If necessary, topsoil compaction may be alleviated by discing or by using a similar implement. Discing or other means of tilling would parallel the contours of slopes. This procedure would not be performed in some locations where thin topsoil overlies rocky subsoil.

In areas of unstable slopes, steep cuts would be restored to a stable position and protected by applying appropriate sediment and erosion control measures. Protective measures may include installation of waterbars or diversion terraces across the construction corridor to stabilize slopes, prevent channeling along the trench line, and divert surface runoff away from the backfilled trench into stabilized areas.

Revegetation would provide long-term sediment and erosion control by establishing a permanent vegetative cover as soon as practicable over disturbed areas. Re-establishment of vegetation would also reduce the visual impacts of the pipeline corridor. All disturbed areas would be revegetated in accordance with federal and state specifications or as directed by the landowner. The initiation of revegetation activities would depend on seasonal constraints established by the Forest Service or landowners.

Revegetation would be initiated within one month after completion of ground disturbing activities, unless otherwise directed by the Forest Service. Design criteria for revegetation are contained in **Appendix D** and summarized here. Following recontouring and seedbed preparation in accordance with the design criteria, disturbed areas would be seeded using short-term sediment and erosion control measures, as needed. Generally, all areas would be mulched with certified weed-free hay at a rate of 2 tons per acre. Hay would be crimped into the soil surface on slopes greater than 20 percent. Woody nursery stock would be used as directed by the Forest Service or landowners, typically where revegetation limitations are severe or the predisturbance community is composed of woody vegetation. Soil erosion would be minimized by surface roughening, mulching, use of erosion control fabric, and installation of surface drainage systems. Sediment barriers and controls such as silt fencing, rock, and straw bale check dams, would be used as needed to keep sediment from entering surface waters.

Short-term sediment and erosion control would be provided by surface mulch, with and without tackifying agents and soil binders, and other erosion control materials. Mulch would aid in soil moisture retention and minimize topsoil erosion by wind and water. Mulching or tackifying may be employed in areas exposed to wind, on unstable slopes, or in sensitive soils. Mulch would be anchored to the ground using a crimper or disc. In some cases, an erosion control blanket may be utilized on unstable slopes, along restored streambanks, and in areas where application of mulch and tackifiers would be impractical.

Pipeline route markers would be installed at road crossings, water crossings, property boundaries, and locations where such markers would not interfere with existing land uses or detract from the scenic values of the Hoback Canyon. Aerial markers would be installed about every 3 miles in cross-country sections along the route and at turning points, to facilitate periodic aerial patrol of the pipeline.

Operation, Maintenance, and Inspection

Pipeline and ancillary facilities would be operated, maintained, and inspected in accordance with DOT regulations (49 CFR 192) and all other applicable federal and state regulations. LVE would prepare and follow a manual of written procedures for the proposed facilities operation, maintenance, and inspection activities and for emergency response. The manual would include procedures for operations, maintenance, inspection, and repair; controlling corrosion; recording construction and operating history; data gathering for reporting incidents involving release of gas; startup and shut down; and periodic review to determine effectiveness and adequacy of operation and maintenance procedures. Pipeline pressure would be continuously monitored through LVE's monitoring system.

Pipeline inspections, pipeline leak surveys, and cathodic protection maintenance would be conducted in accordance with DOT requirements and guidelines and following LVE's internal requirements. Operation and maintenance of the pipeline would include periodic patrols of the pipeline corridor and corrosion/leak detection surveys to detect conditions that may endanger the integrity of the pipeline. DOT guidelines include visual inspection of the pipeline corridor every two weeks. All valves, regulators, meters, and corrosion control test stations would also be inspected regularly. LVE would maintain records of operation and maintenance activities, including any testing, replacements, repairs, and modifications performed. Pipeline markers and signs would be inspected and maintained or replaced, as necessary, to ensure that the pipeline location is visible from the ground.

The pipeline corridor will be visually inspected by ground or aerial patrol once every two weeks to identify potential problems, such as a landslide movement or a gas leak. Where human activity and disturbance are restricted or prohibited in crucial big game winter ranges from November 15 to April 30 (state feedgrounds) or December 1 to April 30 (NFS lands), aerial patrols will be used to inspect the pipeline. All patrols will comply with the conditions specified in the special use authorization for the project. Aerial patrols will be designed to comply with applicable no-fly buffers, noise levels, flight paths, timing, and height above ground level, however, overflights must provide a clear view of the 20-foot-wide pipeline corridor to allow adequate inspection. Routine maintenance would be conducted to facilitate periodic surveys to detect leaks and monitor corrosion, to evaluate slope and soil stability and revegetation success, and to control noxious weeds and sedimentation. Generally, a 20-foot-wide permanent pipeline corridor would be maintained in an herbaceous state.

Timeline: The Proposed Action would be implemented during the spring, summer, and fall of one construction season. Pipeline construction is anticipated to begin during the spring. Based on a normal construction schedule, installation of the pipeline and gas processing facility would be completed in about 180 days, and the pipeline should be fully operational by the beginning of the winter season. The anticipated timeline for construction, including schedule constraints, is shown in **Table 2-2**. Timing restrictions along the proposed pipeline route are shown in **Figure 2-4**.

Normal expected progress for mainline construction would be ½ mile per day. Progress of the Hoback Canyon crew and the crossing crew would vary. Pipeline construction within Hoback Canyon, a distance of 10.5 miles or about 55,000 feet, would progress at an average rate of about 800 feet per day, requiring a 70-day construction schedule. Each highway crossing would be completed in 2 to 3 days, on average. Each river crossing would be completed in about a week, on average, with instream construction activities typically completed within 24 to 48 hours. Instream construction would not occur before August 1.

State of Wyoming wildlife management areas and other wildlife habitats within the BTNF are restricted during designated times of the year when wildlife use these areas. Construction through wildlife habitats would be conducted during periods when use of these areas is not restricted.

TABLE 2-2 CONSTRUCTION TIMELINE

Construction Activity	Days Required	Constraints	Schedule
Mainline (39.2 miles)	80	<ul style="list-style-type: none"> No activity in crucial big game winter range from Nov 15 through Apr 30 (state feedgrounds) or Dec 1 through Apr 30 (NFS lands). 	May-Oct
Hoback Canyon (10.5 miles)	70	<ul style="list-style-type: none"> No activity in crucial big game winter range from Nov 15 through Apr 30 (state feedgrounds) or in crucial big game winter range and elk calving areas from Dec 1 through Jun 30 (NFS lands). No activity in management zones I or II of active bald eagle nest sites (Feb 1 through Aug 15). No activity near active peregrine falcon eyries (Mar 1 through Jul 31) or hack sites (Jul 1 through Sept 15). 	Aug-Oct
Highway crossings, U.S. 189/191 (19) and U.S. 89/191 (2)	60	Refer to Mainline or Hoback Canyon sections, as appropriate, for constraints.	May-Oct
Hoback River crossings (9), Upper Hoback River crossing (1), and Cliff Creek crossing (1)	60	<ul style="list-style-type: none"> No instream construction from Mar 15 through Jul 31 to minimize impacts to spawning trout. 	Aug-Oct

Figure 2-4 Seasonal Restrictions for Construction Activities

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Discussion: The Proposed Action is intended to represent a wildlife-friendly pipeline route that avoids roadless areas as much as possible, conserves the scenic qualities of Hoback Canyon, provides for sound geotechnical design in unstable areas and public and highway worker safety on the existing highway, and incorporates best management practices for protection of water quality, wetlands and riparian areas, and the Hoback River. An independent engineering design review addressing the location of portions of the pipeline route within the highway corridor was conducted for WYDOT by PB Energy Storage Services, Inc. (2005). The results of this review are being addressed in the final design of the proposed action, in consultation with WYDOT.

The pipeline would encroach on the highway corridor in constricted areas along Hoback Canyon and where it must cross the highway. Throughout half of Hoback Canyon, the pipeline would be located more than 28 feet away from the edge of the existing pavement. In the most constricted areas within Hoback Canyon (about half of the canyon), the pipeline would be located 12 to 28 feet away from the edge of the existing pavement. WYDOT requirements for burial of the pipeline 48 inches (4 feet) below the ground surface wherever the pipeline would be within 50 feet of the edge of the highway pavement would be met. Where there is a likelihood of increased WYDOT maintenance and construction activity with the potential to penetrate to the level of the pipe, WYDOT requirements for burial of the pipeline 72 inches (6 feet) below the ground surface would be met. Where the pipeline crosses beneath the highway, the elevation of the pipe for the crossing will match the elevation of the pipe at either end of the crossing. Any deviations from these requirements at specific locations would be determined in consultation with WYDOT and the Forest Service and documented in the Forest Service authorization for the pipeline.

The pipeline's sole purpose is to deliver processed natural gas to the Jackson area. The pipeline would carry processed gas and is not designed to receive natural gas directly from gas wells. The addition of gas resources discovered along the pipeline route to the proposed pipeline is not anticipated.

Rationale: Alternative B fully responds to the purpose of and need for action identified in Chapter 1.0, to provide a steady stream of natural gas to the Jackson area in accordance with Forest Plan guidance, eliminating the need for 500 or more round trips per year by tanker trucks along public highways.

Design Criteria

Design criteria are specific project design features that are incorporated within the Proposed Action. They provide specific guidance on project implementation, and become part of the decision that will be made and the project implementation plan.

Design Criteria Considered But Not Incorporated

The following design criteria were considered and determined not to be reasonable design criteria. The theme, a discussion of the design criteria, and the analysis and rationale for eliminating each of these design criteria are presented below.

Design Criteria: Boring Underneath the Hoback River and Other Stream Crossings

Theme: Reduce the effects of pipeline construction and maintenance on the Hoback River and other stream crossings by boring underneath the Hoback River and affected streams to install the pipeline.

Discussion: Boring underneath the Hoback River to install the pipeline at river crossings was considered, however, the results of geotechnical investigations conducted indicate that the rocks at proposed river crossings are too loose and are not competent enough to be bored. Staging of river bores in narrow canyon areas would also require considerable extra working space outside the construction corridor. Sufficient extra space may not be available.

The majority of the Project Area crosses rocky foothill and canyon terrain containing fractured rocks from diverse geologic formations with few areas of Holocene aggradation. Within Hoback Canyon the Hoback River is rocky and deeply entrenched. Most of the side drainages flow through steep-sided gulches. Hoback Canyon cuts through complex folds of the thrust belt where most outcrops are tilted and folded. The thrust belt extends to the vicinity of the pipeline origin near Merna. Consistent rock assemblages with minimal fracturing and folding would be most suitable for boring. Fracturing, varying hardness, and rock layers tilted or folded in a manner that could displace the bore, are all unfavorable factors for boring. The risk associated with boring the Hoback River, streams, and wetlands within the thrust belt and creating the potential for a frac-out, with lost drilling muds affecting water quality and aquatic habitat, was judged to be an unacceptable environmental impact during the design of the proposed pipeline. No river or stream crossings for the proposed pipeline would be located outside the thrust belt in more favorable rock units for boring, therefore no river or stream borings were planned. Planned highway bores would not risk a frac-out underneath a river or stream channel.

Rationale: This design requirement was dropped because it is not considered to be technically feasible or environmentally responsible. Drilling through cobbles and fractured rock could potentially cause hole collapse, frac-outs, and lost circulation during drilling, resulting in the addition of drilling mud (bentonite clay materials) to the substrate of the river channel or stream channels.

Design Criteria: Bore Landslide in Camp Creek Saddle Area

Theme: Eliminate the effects of pipeline construction and maintenance on an existing landslide in the Camp Creek Saddle area.

Discussion: Boring an existing landslide area just south of Camp Creek Saddle was considered. This landslide area was determined by geotechnical investigation to have a slide plane that is 40 to 60 feet below the surface. The landslide area is about 1,500 feet long with an elevation difference of 800 feet, but the area of surface disturbance and temporary access would be considerably longer (about 6,000 feet). Most bores in landslide areas are designed to be perpendicular to the slide plane, however, a bore of this landslide would be parallel to or along the slide plane. A bore would involve directional drilling under extreme pressure given the physical circumstances, and would be susceptible to the loss of drilling fluids through frac-outs and lost circulation that could introduce drilling mud containing bentonite to unstable areas or the slip plane itself, possibly resulting in activation of the slip plane.

Rationale: This design requirement was dropped because it was not considered to be technically feasible or environmentally responsible to construct a pipeline by boring the landslide in the Camp Creek Saddle area. It would not be technically feasible to bore the landslide without risking activation of the slide plane.

Design Criteria Incorporated

Design criteria for the Proposed Action are presented in **Appendix D**.

Monitoring

Monitoring would be conducted during project implementation to assure that design criteria are followed and are adequate. Monitoring requirements for the Proposed Action, by resource topic, are presented in **Appendix D**. The monitoring requirements would support the design criteria listed in **Appendix D**.

Mitigation

During project implementation, if design criteria are found to be inadequate through monitoring, incomplete data available when design criteria were developed, changed conditions, or unforeseen circumstances, mitigation measures will be developed and implemented. During the development of the Proposed Action, some concerns were identified that may require mitigation measures during project implementation. These potential mitigation measures would support the design criteria and monitoring requirements for project implementation that are listed in **Appendix D**.

2.4 RANGE OF ALTERNATIVES

The range of alternatives considered was determined from the scope of the proposed project and the purpose of and need for action. The issues described in Chapter 1 largely defined this scope. In addition to the alternatives considered in detail, the alternatives eliminated from further consideration contributed to the reasonable range of alternatives even though they are not analyzed in detail.

A principal influence on the range of alternatives was Forest Plan direction, consisting of goals and objectives, Forest-wide and MA standards and guidelines, and the desired future conditions (DFCs). Other influences included technical and economic viability, federal laws, regulations, and policies, and the requirements of local jurisdictions, including WYDOT. Within these parameters, the alternatives developed by the IDT display a reasonable range of management options.

The National Forest Management Act (NFMA) requires National Forests to be managed in accordance with an approved Forest Plan, which must be revised periodically. The Forest Plan for the Bridger-Teton National Forest, which has not yet been revised, contains the management vision and guidance for the Forest. The Proposed Action meets all guidance contained in the Forest Plan. Other alternatives that are not fully consistent with Forest Plan guidance would not make an additional contribution to the reasonableness of the range of alternatives unless key issues are addressed.

2.5 COMPARISON OF ALTERNATIVES

Comparisons of the proposed activities, achievement of purpose and need, and environmental effects for Alternative A – No Action and Alternative B – Proposed Action provide an understanding of the similarities and differences that exist between them.

2.5.1 Proposed Activities

Table 2-3 summarizes the activities included in each alternative analyzed in detail.

TABLE 2-3 COMPARISON OF ACTIVITIES

Proposed Activities	Alternative A	Alternative B
Pipeline Corridor (total miles, all types of surface ownership)	0	49.7
Pipeline Corridor (total miles, National Forest lands)	0	25.4
Crossings of Hoback River	0	9
Crossing of Upper Hoback River	0	1
Crossing of Cliff Creek	0	1
Crossings of U.S. 189/191 (Hoback Canyon Highway)	0	19
Crossings of U.S. 89/191 Near Jackson	0	2
Construction Areas (potential short-term disturbance for construction corridor and temporary work areas, total acres)	0	370

Proposed Activities	Alternative A	Alternative B
Pipeline Maintenance Corridor (20-foot-wide area affected over the long term; no shrubs or trees would be restored, total acres)	0	120
Gas Processing Facility (potential long-term disturbance, total acres)	0	<1
Transport of LNG to Jackson by Tanker Trucks on Public Highways (estimated round trips per year – range represents current estimate of round trips per year and anticipated round trips per year within 5 years)	500 to 600	<50

2.5.2 Achievement of Purpose and Need

The purpose of and need for action for the proposed project, described in Chapter 1, is summarized by the comparison elements in **Table 2-4**. The comparison elements represent the objectives of the proposed project and the Forest Service goal of meeting Forest Plan guidance. The responsiveness of each alternative analyzed in detail to the purpose and need is compared by the elements in **Table 2-4**.

TABLE 2-4 ACHIEVEMENT OF PURPOSE AND NEED

Comparison Element	Alternative A	Alternative B
Continue to provide LNG to the Jackson area, as needed.	Yes	Yes
Provide a steady stream of processed and odorized natural gas to the Jackson area.	No	Yes
Eliminate 500 or more round trips per year by tanker trucks along public highways	No	Yes
Enhance the diversity of fuels available in Jackson by providing a steady supply of natural gas to the Jackson area.	No	Yes
Use an economical supply of natural gas developed nearby, in northern Sublette County, to meet the needs of LVE's customers in the Jackson area.	No	Yes
Modernize the energy supply infrastructure in western Wyoming by installing a gas pipeline which would eliminate 500 or more round trips per year by tanker trucks along public highways.	No	Yes
Improve the environment by reducing the effects on air quality from tanker truck emissions.	No	Yes
Improve the protection of the environment, including scenic, recreational, fisheries, and wildlife values in Hoback Canyon, by using a pipeline which is less likely than a tanker truck to have an incident occur that could cause environmental damage.	No	Yes
Potentially reduce the risk of a wildland fire start associated with an incident related to the delivery of natural gas to Jackson..	No	Yes
Meet All Forest Plan Guidance	Yes	Yes

2.5.3 Preferred Alternative

The Forest Service has identified the Proposed Action, which fully achieves the purpose and need for the proposed project, as the preferred alternative. All alternatives considered in detail could potentially be identified as the preferred alternative. The No Action alternative was considered in detail for selection as the preferred alternative, but was not identified as the preferred alternative because it would not achieve the purpose and need for the proposed project, which encompasses multiple objectives. The No Action alternative would achieve only one of the project objectives, continue to provide LNG to the Jackson area as needed. Both the No Action alternative and the Proposed Action would meet all Forest Plan guidance.

2.5.4 Environmental Effects

The environmental effects of each alternative analyzed in detail are summarized in **Table 2-5** in a format that facilitates comparison between the alternatives.

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TABLE 2-5 COMPARISON OF ENVIRONMENTAL EFFECTS

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
THE PHYSICAL ENVIRONMENT		
<i>Air</i>		
Emissions related to truck transport of LNG to Jackson (emission factors for heavy-duty vehicles) – nitrogen oxides [NO _x], carbon monoxide [CO], and volatile organic compounds [VOCs] in tons per year)	NO _x – 2.70 CO – 0.97 VOCs – 0.13	NO _x – 0.20 CO – 0.07 VOCs – 0.01
Emissions related to treatment of natural gas by glycol dehydration and injection of air before gas enters pipeline (NO _x , CO, and VOCs in tons per year)	Not Applicable	NO _x – 9.48 CO – 11.96 VOCs – 0.69
Effects related to noise and odor	Noise and odor impacts associated with tanker truck traffic	Reduced noise and odor impacts from less tanker truck traffic. Temporary noise impacts during construction activities.
Effects from fugitive dust and exhaust from construction vehicles or equipment during pipeline construction	Not Applicable	Some temporary effects on air quality likely in the immediate vicinity of construction activities. Effects would be controlled with dust abatement practices.
Effects related to operation and maintenance of pipeline	Not Applicable	Some intermittent and short-term effects on air quality in the immediate vicinity of the pipeline corridor. Effects from particulate matter and vehicle exhaust would be local and dispersed by prevailing winds. Effects would be controlled with dust abatement practices.
Effects on air-quality-related values and regional haze at Class I and sensitive Class II areas	Any effects on visual range and acid deposition at nearby Class I and sensitive Class II that could be directly attributed to tanker truck traffic would not be noticeable.	Visual range and acid deposition at nearby Class I and sensitive Class II areas should not be noticeably affected with low emissions of NO _x .

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
Compliance with State of Wyoming and National Ambient Air Quality Standards	Yes	Yes
<i>Streams and Watershed</i>		
Effects on stream channel conditions and stability	No effect	Nine crossings of the Hoback River, one crossing of Cliff Creek, and one crossing of the Upper Hoback River may temporarily affect stream channel conditions and stability. Changes in stream morphology or siltation can have noticeable effects on the long-term health of fisheries. Full recovery has been reported to occur between 6 weeks and 2 years after construction. Design criteria in Appendix D would minimize effects on all stream and drainage crossings.
Effects on natural flow characteristics, water quality, and quantity	No effect	May temporarily affect natural flow characteristics and water quality (turbidity, total suspended solids, nutrients, and bed load) for the duration of instream construction. Hydrostatic testing of the pipeline would not be expected to cause noticeable impacts to water quality or quantity in the Hoback River. Design criteria in Appendix D would minimize effects.
Effects on streambank stability	No effect	Stability of creeks with low geomorphic integrity ratings may be affected over the short term on less than 2 acres along Cliff Creek and less than 1 acre along Muddy Creek. Design criteria in Appendix D would minimize effects.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
Potential sedimentation	No effect	Sedimentation may increase over the short term during construction activities. The potential for sediment to enter streams would be minimized by avoiding operations in the water influence zone (WIZ) and using sediment barriers. Design criteria in Appendix D would minimize effects.
<i>Soils and Geology</i>		
Soil disturbance (acres)	No effect	Short-term disturbance would affect 370 acres. About 250 acres would be reclaimed immediately following pipeline construction, and could be revegetated with tree and shrub species where appropriate. The remaining 120 acres would be reclaimed immediately following pipeline construction, but would be revegetated with herbaceous grasses and forbs only, not with tree and shrub species, because these areas would be within 10 feet of the buried pipeline and included in a long-term pipeline maintenance corridor.
Disturbance in sensitive soils susceptible to erosion, compaction, or revegetation failure (acres)	No effect	Construction activities along the pipeline corridor and in temporary work areas (TWAs) would result in 1 acre of disturbance associated with stream crossings, 3 acres of short-term disturbance associated with the construction corridor, and 2 acres of long-term affected areas associated with the 20-foot wide pipeline maintenance corridor.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
On-site erosion (tons per acre – first year following pipeline installation)	Projected soil loss under existing conditions would be 0.02 to 1.66 tons per acre per year.	Projected soil loss in Year 1 would be 0.76 to 4.91 tons per acre per year.
On-site erosion (tons per acre – fifth year following pipeline installation)	Projected soil loss under existing conditions would be 0.02 to 1.66 tons per acre per year.	Projected soil loss in Year 5 would be 0.16 to 1.06 tons per acre per year. The range of estimates for soil loss in Year 5, compared with existing conditions, indicates Forest Plan guidance requiring a 95 percent reduction in soil loss within 5 years following project implementation would be met.
Disturbance in areas with steep slopes or slope stability concerns (acres)	No effect	An estimated 6 acres with landslides and slope stability concerns would be affected in the short term (2 percent of the total short-term disturbance of 370 acres). Long-term use associated with the maintenance corridor would affect 3 acres in areas with landslides and slope stability concerns, or about 2 percent of the total long-term affected area of 120 acres. Affected areas have been evaluated in a geotechnical investigation (Plumley 2005) and the recommendations of that investigation have been followed in designing the proposed pipeline. No areas with landslides or slope stability concerns have been identified within any TWAs.
Disturbance in active or potentially active landslides or debris flows (acres)	No effect	See above
Compliance with Soil Management Standard for special geotechnical/slope stability design to control risk of mass	Not Applicable	Special design criteria identified through geotechnical evaluations

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
wasting and sedimentation		would be incorporated to comply with Forest Plan guidance on geotechnical design.
THE BIOLOGICAL ENVIRONMENT		
<i>Vegetation (Including Wetlands and Riparian Areas, Rangeland Resources, Special Status Species, and Noxious Weeds)</i>		
Effects on vegetation, by vegetation type	No effect	<p>An estimated 370 acres would be disturbed with 250 acres reclaimed and restored to preexisting conditions and 120 acres revegetated with grasses and herbaceous plants only. About 34 acres of forested habitat would be disturbed with 13 acres remaining in a non-forested cover type as part of the pipeline maintenance corridor.</p> <p>Short-term/Long-term (acres)</p> <hr/> <p>Aspen – 9/3 Douglas-fir – 4/2 Lodgepole pine – 17/6 Engelmann spruce/Subalpine fir – 4/2 Riparian – 15/6 Non-forested 109/40 No data outside National Forest – 212/61</p>
Wetland and riparian disturbance (acres)	No effect	<p>15 acres within riparian areas on NFS lands temporarily affected. 53 wetlands on 30.68 acres temporarily affected. 5 sites on 1.84 acres provisionally identified as Waters of the U.S., would be temporarily affected. Riparian and wetland vegetation and function would be restored in accordance with Appendix D after construction activities are completed. No loss of wetland acres or function anticipated over the long-term.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
Effects on streambank vegetation	No effect	Vegetation would only be cleared to provide sufficient workspace. Vegetation damage caused by extended periods without water would be unlikely. Occasional trees would be removed during construction. Streambank vegetation would be restored in accordance with Appendix D after construction activities are completed.
Effects on rangeland resources and livestock grazing	No effect	Effects on livestock grazing and rangeland resources would be low because of the large size of the allotments compared with the small area disturbed during construction. Temporary fences would be used to reduce conflicts with livestock operations. Changes to the timing of construction operations, where feasible, also could reduce conflicts. It would not be feasible to move livestock to a different pasture during construction to reduce conflicts. No effects on livestock grazing after construction is completed
Effects on wildland fire hazards	The potential spread of weeds along the highway corridor could also contribute to fuel loading and wildland fire hazards. The use of tanker trucks to deliver LNG to Jackson could involve the risk of a wildland fire escaping from the scene of an incident.	Minimal effects in areas cleared for construction. Woody material would be stockpiled and disposed of in accordance with Appendix D . Any fuels left for removal as firewood would be placed near a road where there would be little effect on the spread of potential wildland fires. Use for erosion control or wildlife

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>habitat would have little effect because of the small amount of fuels distributed over a large area. Burning in slash piles would follow strict guidelines provided by the Forest Service and would be closely monitored. The use of a pipeline to deliver gas to Jackson would be unlikely to involve the risk of a wildland fire escaping from the scene of an incident.</p>
<p>Effects on Special Status Plant Species - Proposed, Threatened, and Endangered Species, Forest Service Sensitive Species, and Management Indicator Species (MIS)</p>	<p>No effect</p>	<p>Proposed, Threatened, or Endangered plant species would not be affected. Three Forest Service Sensitive Species, soft aster, Payson’s milkvetch (also MIS), and Payson’s bladderpod, and one MIS (boreal draba) are known to occur in the Project Area, however, there are no known occurrences within the 75-foot construction corridor and temporary use areas. The pipeline route avoids habitats where boreal draba and Payson’s bladderpod are found. Activities associated with pipeline installation could create new habitat for Payson’s milkvetch, which is associated with disturbed areas. 3 State of Wyoming Species of Concern, flat-top broomrape, fragile rockbrake, and creeping campion, could potentially be affected. Cutting of aspen (MIS) on 9 acres of NFS lands could stimulate sucker growth.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		Regrowth of aspen on 3 acres would diversify stand structure by providing stand initiation (seedling/sapling).
New disturbed areas susceptible to noxious weed infestation (acres)	Tanker truck traffic could potentially contribute to the spread of weeds along the highway corridor.	High potential for weed spread due to surface disturbance and use of existing roads and highways. An estimated 370 acres would be disturbed using 50 or more pieces of heavy duty equipment and vehicles. Existing roads and remote areas along the route would experience increased traffic during construction, which could increase weed populations in these areas. Design criteria in Appendix D would mitigate potential effects.
<i>Wildlife and Fisheries, Including Special-Status Species</i>		
Effects on species and habitats	Collisions between wildlife and tanker trucks transporting LNG could occur, injuring or killing those individuals involved in the accidents. There would be no other direct or indirect effects on wildlife and fisheries.	Disturbance from tanker truck traffic and risk of collisions with tanker trucks would be reduced. The pipeline would not act as a barrier to the movement of wildlife. Construction disturbance (370 acres) could cause temporary displacement of wildlife and fish over a period of six months. Displacement would be in response to habitat disturbance or the bustle of nearby activity during pipeline installation. However, construction through wildlife habitats would be conducted during periods when use of these areas is not restricted by Forest Plan standards.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>Small reductions in available forage and habitats for wildlife and fisheries along the proposed pipeline route until construction and reclamation of the pipeline corridor is completed. A permanent pipeline corridor (120 acres) without shrubs or trees would affect habitats that depend on these vegetation types.</p> <p>Localized and short-term effects on fisheries. Recovery expected within a year based on monitoring studies of similar projects</p> <p>Operation and maintenance activities would have no noticeable effect on wildlife and fisheries. Activities would adhere to protective restrictions and would not noticeably affect wildlife behavior.</p>
Effects on big game populations	Collisions between wildlife and tanker trucks transporting LNG could occur, injuring or killing those individuals involved in the accidents.	<p>Disturbance from tanker truck traffic and risk of collisions with tanker trucks would be reduced. The pipeline would not act as a barrier to the movement of big game.</p> <p>Construction activities could temporarily displace big game from areas along the pipeline corridor. To reduce impacts to big game, construction activity would adhere to seasonal range timing restrictions.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		Effects greatly reduced during operation and maintenance of the pipeline when very little human activity would occur. Aerial and ground activities would be periodic and would not be expected to cause undue stress to big game. Maintenance and monitoring activities would be scheduled and designed to comply with applicable restrictions for the protection of wildlife.
Effects on existing elk feedgrounds	No effect	Construction would disturb 5 acres within the Camp Creek and Horse Creek winter feedgrounds. No construction activities would occur between November 16 and April 30 in feedgrounds. The pipeline would not act as a barrier to elk movement in the Camp Creek Saddle area.
Effects on Federally Listed Species	Collisions between wildlife and tanker trucks transporting LNG could occur, injuring or killing those individuals involved in the accidents	Potential disturbance from tanker truck traffic and risk of collisions with tanker trucks would be reduced. The pipeline would not act as a barrier to the movement of wildlife. Effects would be limited to potential effects on individuals. Adverse effects on individuals are unlikely for the following species: Canada lynx; and gray wolf. Project design criteria would mitigate potential effects.
Effects on Forest Service Sensitive Species	Collisions between wildlife and tanker trucks transporting LNG	Disturbance from tanker truck traffic and risk of collisions with tanker

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
	<p>could occur, injuring or killing those individuals involved in the accidents.</p> <p>Tanker truck traffic along the highway corridor would be unlikely to affect bald eagle nesting territories.</p>	<p>trucks would be reduced.</p> <p>Design criteria in Appendix D adhere to guidance and restrictions in the Forest Plan and Greater Yellowstone Bald Eagle Management Plan. No direct injury, mortality, or disturbance of individual bald eagles expected during construction or reclamation activities. Periodic monitoring patrols during operations and maintenance would not cause nest abandonment. Appendix D provides protection for new nesting territories and establishes restrictions around all known active bald eagle nest sites during the critical nesting period.</p> <p>No impact on trumpeter swan. May adversely impact individuals of other Forest Service Sensitive Species, but not likely to result in a loss of viability or cause a trend to federal listing or a loss of species viability range-wide. Effects not expected to be measurable.</p> <p>Greater sage grouse, if present in the area, could be affected, however, there are no known occurrences of greater sage grouse leks. If leks are</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>identified, appropriate buffers and restrictions would be established.</p> <p>Disturbance to riparian areas and potential erosion and siltation could affect Snake River fine-spotted cutthroat, and possibly could affect Colorado River Cutthroat (CRCT), as the Beaver Creek drainage contains a core conservation population in South Beaver Creek. However, project impacts are not expected to affect South Beaver Creek, and design criteria in Appendix D would greatly reduce potential impacts.</p>
Effects on Management Indicator Species (MIS)	Collisions between wildlife and tanker trucks transporting LNG could occur, injuring or killing those individuals involved in the accidents. However, there are no known nest occurrences along the highway corridor.	<p>Disturbance from tanker truck traffic and risk of collisions with tanker trucks would be reduced.</p> <p>Construction activities could temporarily displace wildlife along the pipeline corridor. Monitoring patrols during operations and maintenance would be periodic and would not be expected to cause undue stress to wildlife.</p> <p>Disturbance to riparian or wetland areas and potential erosion/siltation could affect cutthroat trout (all subspecies), boreal toads, or boreal chorus frogs, however, design criteria in Appendix D would greatly reduce potential impacts to wetland habitats.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		Habitat modification by surface disturbance may indirectly impact cutthroat trout (all subspecies), boreal toads, or boreal chorus frogs by altering prey or food sources in riparian and wetland habitats. Design criteria in Appendix D would reduce impacts.
Effects on migratory birds	Collisions between wildlife and tanker trucks transporting LNG could occur, injuring or killing those individuals involved in the accidents. However, there are no known nest occurrences along the highway corridor.	Potential for disturbance from tanker truck traffic and risk of collisions with tanker trucks would be reduced. Construction activities could temporarily displace migratory birds, if they occur in the area. However, most of the pipeline would be constructed adjacent to the highway in already disturbed areas. Periodic monitoring and maintenance activities would not be likely to cause nest abandonment.
THE HUMAN ENVIRONMENT		
<i>Heritage Resources</i>		
Potential effects on heritage resources and eligible sites	No effect	No direct adverse impacts on known eligible or potentially eligible sites (prehistoric and historic components). The setting and feeling of three eligible or unevaluated historic sites located close to the proposed construction corridor may be affected indirectly over the short-term, however, the proposed project is unlikely to have a permanent

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		impact on these sites. Project design criteria in Appendix D would mitigate potential impacts.
Potential effects on unknown sites	No effect	Potential exists for a small number of unknown heritage resources in buried contexts or in areas of poor surface visibility, which could be affected by project activities. Holocene and Pleistocene terrace settings near creeks and two other areas, where unanticipated discoveries may occur, should be monitored during surface clearing and trenching activities (Appendix D).
Land Use		
Effects on existing land uses	No effect	Construction activities could disrupt existing land uses. Bondurant and other residential areas along the pipeline route would be affected by delays and the bustle of activity. Operations and maintenance along the pipeline corridor and processing facility would not have noticeable effect on existing land uses. Mitigation measures would protect private interests and authorized uses affected by project. Authorized uses crossed by pipeline route would be protected or moved to pipeline trench by agreement of all parties involved.
Effects on landlines, private property, and federally recognized conservation easements	No effect	Private properties with conservation easements would be crossed in three areas: Melody Ranch, (Teton County

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		Scenic Preserve Trust); Poison Creek, (Jackson Hole Land Trust); and River Bend Ranch, (Jackson Hole Land Trust). Less than 5 acres of disturbance would occur in easements outside highway corridor. Permanent pipeline corridor across easements would be 8,000 feet (1.5 miles) long, containing pipeline markers but no shrubs or trees. Terms and conditions for pipeline crossing of easements would be established by agreement of all parties involved.
Recreation		
Effects on Gros Ventre Wilderness and the Shoal Creek wilderness study area (WSA)	No effect	No direct impact on Gros Ventre Wilderness or Shoal Creek WSA. Road access to some trailheads impacted for short periods and noise impacts from nearby construction activities would affect experiences.
Effects on recreation values along segments and corridors of the Hoback River and its tributaries (Shoal, Cliff, Granite, and Willow Creeks) within the Nationwide Rivers Inventory (NRI) that are eligible for designation as Wild, Scenic, or Recreation Rivers	Highway use by tanker trucks could affect scenic, recreational, fisheries, or wildlife values that make Hoback River eligible for designation. The likelihood of incidents with environmental damage involving tanker trucks that would affect these values would increase with the projected increase in tanker truck traffic on U.S. 189/191.	No noticeable effect on landscapes along Hoback River from pipeline installation and operation, once vegetation within corridor is re-established. No effect on outstanding scenery values. Hoback Canyon has potential for short-term impacts at river crossings. Design criteria in Appendix D would protect the integrity of the river and its values. A pipeline incident with environmental damage that could affect the scenic, recreational,

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		fisheries, or wildlife values that make Hoback River eligible for designation would be unlikely to occur.
Effects on the undeveloped character of roadless areas	No effect	Minimal impact on roadless values over the long-term. Areas affected by construction would regain remoteness, solitude, and natural appearance following reclamation using design criteria in Appendix D .
Effects on recreation opportunities and Recreation Opportunity Spectrum (ROS) Class	No effect	<p>Little, if any, impact to recreation opportunities. Access temporarily impacted at times. Access to National Forest developed sites and dispersed opportunities not precluded.</p> <p>Affected areas would still have natural appearance associated with ROS class setting following reclamation using design criteria in Appendix D.</p>
Effects on recreation use, including displacement of recreation activities	Increases in tanker truck traffic over time may contribute to perceived negative effect on recreational experience for travelers on scenic byway, recreationists along Hoback River, and Forest visitors at Kozy and Hoback Campgrounds.	Some short-term travel delays and displacement of recreation users for up to 2 to 3 days at a time over a period of 6 months from May to October during construction. Could affect hiking, horseback riding, hunting, photography, fishing, wildlife viewing, and rafting. Noise and bustle of activity, visual impairment, and minor vegetative disturbance expected. Hoback River not accessible to river users at crossing sites while pipeline is

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		constructed under river bed. Design criteria in Appendix D would prevent long-term impacts.
Effects on existing recreation facilities (campgrounds, trailheads, other facilities)	No effect	Noise, activity, and short-term access delays during construction may affect Kozy and Hoback campgrounds and several trailheads. Recreational experiences of campers on west side of Kozy Campground, where Hoback River would be crossed, affected until work is completed. Short access delays may affect Granite Creek Road, which provides access to Granite Hot Springs, Granite Campground, numerous summer home sites, the Girl Scout Camp, American Wilderness Leadership School, and several trailheads (Cliff Creek, Granite Creek, Bryan Flat and Horse Creek).
Effects on recreation special uses	No effect	Recreation special uses could be restricted for short periods during construction activities. Where appropriate, activity could be relocated temporarily to avoid effects on authorized uses.
Transportation		
Effects of pipeline construction, operation, and maintenance on the highway corridor, existing road facilities and structures, and public travel	Not Applicable	Low, short-term effects on traffic flow, public travel, and safety during construction. Traffic flow slowed down intermittently and traveling public inconvenienced for 6 months or so during construction.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>Effects would include travel delays of up to 15 or 20 minutes in duration along highway and bustle of activity, including presence of materials, staging areas, construction workers, and equipment along the highway corridor during pipeline installation.</p> <p>No noticeable effects on transportation system during operations and maintenance of pipeline.</p>
<p>Effects on a portion of the Wyoming Centennial Scenic Byway (U.S. 189/191), a sensitive travel route</p>	<p>Traffic flow on scenic byway may be intermittently slowed down or less convenient as tanker truck round trips increase over time. Increases in tanker truck traffic over time may contribute to perceived negative effect on scenic and historical experiences for travelers on scenic byway.</p>	<p>Most of pipeline corridor within foreground views of travelers on scenic byway. Pipeline corridor, including 5 block valves, not a noticeable addition to existing landscapes with linear features, provided valves are screened by painting and vegetation according to Appendix D design criteria. Corridor not visually evident once vegetation is established.</p>
<p>Effects of LNG delivery by truck on highway corridors, existing road facilities and structures, and public travel</p>	<p>Likely increase in highway maintenance over time. Design deficiencies on U.S. 189/191 likely compounded by projected increases in traffic volumes and truck deliveries of LNG. Potential for accidents and spills likely elevated. Related public safety risk also likely to increase over time. Accident involving a tanker truck loaded with LNG could result in a</p>	<p>Potential safety hazards associated with LNG transport by tanker trucks would be greatly reduced. Reduced reliance on the transport of LNG along public highways would also reduce the potential vulnerability of the Jackson area to interruptions in gas supply.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
	fire, should leaking LNG ignite. Continued reliance on highway transport of LNG could leave Jackson area vulnerable to interruptions in gas supply if highway is closed or impassable.	
<i>Pipeline Safety</i>		
Effects on public safety during pipeline construction	Not Applicable	<p>Pipeline construction a potential safety hazard to motorists on U.S. 189/191. Flagmen, barriers, warning signs, lights, and walkways would safeguard public at road crossings and construction areas adjacent to highway. Traffic control measures or suitable bypass roads would keep roads passable and traffic moving. Steel plates would be installed, as needed. Debris would be kept off road surfaces.</p> <p>Recreationists using Hoback River for boating or other activities during instream construction would be warned of need to avoid crossing areas. Safe upstream take-out areas and downstream put-in areas would be identified.</p> <p>Accidental ignitions by construction crews or equipment could result in wildland fire. A fire prevention program would reduce risk.</p>
Effects on public safety related to pipeline operation and maintenance	Not Applicable	Minimal public safety risk during pipeline operation and maintenance.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>Inspections, leak surveys, and cathodic protection are outlined in Appendix D. Meeting requirements of 49 CFR 192, would ensure structural integrity of pipeline, and prevent damage by third parties. Monitoring in Camp Creek area would track earth movement. Pipeline markers/signs would be inspected and maintained to ensure pipeline location is visible.</p>
Scenic Resources		
Effects on existing scenic integrity and scenic attractiveness	No effect	<p>Surface disturbance would alter existing line, form, color, and texture from sensitive viewing areas. Valves along pipeline route would not be visually evident provided mitigation measures in Appendix D are used to obscure or screen them. Effects limited to viewers within foreground distance zones because corridor is screened from distance views by terrain and intervening vegetation. Design criteria in Appendix D would reduce effects on scenic resources.</p>
Visibility from Gros Ventre Wilderness and the Shoal Creek WSA	Not Applicable	<p>Pipeline corridor not visible from Shoal Creek WSA. Corridor screened by vegetation or rugged terrain. Pipeline corridor not visible from locations in WSA or Gros Ventre Wilderness high enough to overlook pipeline route and not screened by vegetation or terrain. Once vegetation is re-established, corridor would be</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		<p>obscured by distance from overlook locations. Textural contrasts would be very difficult to discern.</p> <p>Hoback Canyon valve in foreground views of trail along Cow Creek (FDT 3120) that accesses Gros Ventre Wilderness. Planting of tall clump grasses and paint would screen valve from trail and blend with landscape.</p>
Visibility from residential areas	Not Applicable	<p>Pipeline corridor would not cross through any residential subdivisions; however, construction corridor would be within foreground views from several residential subdivisions. Corridor would be visible from many different viewpoints in subdivisions. Most of corridor would be screened from residences by rugged terrain.</p>
Visibility from existing recreation facilities	Not Applicable	<p>No effect on viewing area of campers at Hoback Campground. Trees would provide some screening.</p> <p>Construction activities visually intrusive in Kozy Campground. Few trees would screen activities. Once pipeline is installed and vegetation is established, corridor would not be discernible to most viewers, as much of route in immediate foreground views of campers is in existing highway corridor.</p>
Effects on the scenic byway corridor (a sensitive travel route), including compliance with the Scenic Byway and Wild and	Increases in tanker truck traffic over time may contribute to a	Most construction would occur within foreground views of travelers

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
<p>Scenic Rivers Visual Standard (Forest Plan, p. 123, as added by Attachment One to the Forest Plan Record of Decision)</p>	<p>perceived negative effect on scenic and historical experiences for travelers on the scenic byway.</p>	<p>on scenic byway. Pipeline corridor not a noticeable addition to landscapes with linear features. Once vegetation is established, corridor not visually evident to most viewers.</p> <p>Pipeline would cross Hoback River at nine locations, including 5 locations in Hoback Canyon. Cliff Creek also would be crossed at one location. Pipeline corridor would utilize existing clearings on both sides of the highway to the extent feasible. Portions of pipeline within highway corridor would affect areas already disturbed to accommodate highway, highway shoulder, and turn-outs.</p> <p>Visual impact of 5 block valves in foreground views along highway would be minimized by painting them to blend with landscape.</p> <p>The low profile of valves and surrounding rural developments would prevent 4 of the valves from being easily noticed by most travelers on the highway.</p> <p>One valve in Hoback Canyon would be more visible to travelers when there is snow cover. Valve would be screened by planting of tall clump grasses that would obscure it.</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
<p>Effects on visual quality along segments and corridors of the Hoback River and its tributaries (Shoal, Cliff, Granite, and Willow Creeks) within the Nationwide Rivers Inventory (NRI) that are eligible for designation as Wild, Scenic, or Recreation Rivers, including compliance with the Wild and Scenic Rivers Standard and Visual Quality Standard (Forest Plan, p. 142, as added by Attachment One to the Forest Plan Record of Decision)</p>	<p>The current and projected use of the highway by tanker trucks could affect the scenic, recreational, fisheries or wildlife values that make the Hoback River eligible for designation. The likelihood of accidents or environmental damage that would affect these values would increase with the projected increase in tanker truck traffic on U.S. 189/191 through Hoback Canyon.</p>	<p>No noticeable effect on outstanding visual quality of landscapes along Hoback River from installation and operation of pipeline, once vegetation is re-established. Outstanding scenery values not affected by project. Pipeline corridor not a noticeable addition to landscapes that already include linear features.</p> <p>Hoback River crossings would utilize existing clearings on both sides of the highway to minimize effects. Pipeline within highway corridor would affect areas already disturbed.</p>
<p>Visual quality objectives (VQOs) of preservation or retention met or not met in the foreground viewing zone along the Hoback River and the scenic byway</p>	<p>Yes</p>	<p>Yes</p> <p>Visual quality objectives and Forest Plan standards and guidelines would be met for visual resources and the scenic byway. Most disturbance would be confined to areas within about 125 feet of the existing U.S. highway. The disturbance, including tree removal incidental to pipeline installation, would blend in with the existing linear disturbance area along the highway. There would be no noticeable effect once vegetation is re-established. The pipeline corridor would not be a noticeable addition to the existing landscape. Pipeline markers and the lack of shrubs or trees would be the only long-term</p>

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
		visible effect of the 20-foot-wide maintenance corridor.
<i>Social and Economic Resources</i>		
Effects on employment, wages, housing, and community infrastructure in the Jackson Human Resource Unit (HRU), including the community of Bondurant	No effect	<p>No noticeable or measurable effect on local economy or social structure. Required skills and services would be provided by current employees and local or regional contractors with no expected change in population. Any temporary housing needs for the construction workforce could be accommodated by existing resources.</p> <p>Pipeline would facilitate ongoing community growth by meeting expanding energy needs and delivering gas to Jackson more efficiently.</p>
Effects on employment, wages, housing, and community infrastructure in the Big Piney HRU	No effect	No noticeable or measurable effect on local economy or social structure. Any temporary housing needs for the construction workforce could be accommodated by existing resources.
Effects on employment, wages, housing, and community infrastructure in the Pinedale HRU	No effect	No noticeable or measurable effect on local economy or social structure. Although temporary housing is tight and in high demand, the 200 or so workers associated with the proposed project would be accommodated by a combination of resources, including short-term housing rentals, motels, RVs, and the potential establishment of a temporary man camp located on private lands.

Comparison Elements	Alternative A No Action	Alternative B Proposed Action
Socioeconomic effects of LNG delivery by truck	No noticeable or measurable effect on local economy or social structure. Increased risk of tanker truck accidents would potentially increase need for fire and emergency services. A serious accident involving a tanker truck could have an effect on the local economy and social structure that would be measured in the millions of dollars.	No noticeable or measurable effect on local economy or social structure. A serious accident involving a tanker truck could have an effect on the local economy and social structure that would be measured in the millions of dollars.
Socioeconomic effects on communities and tourism from changes in recreation, hunting, or wildlife viewing opportunities, or changes in scenery	No effect	Employment and income from tourism activity is significant in Teton County and surrounding areas. No permanent displacement of recreational activity and any resulting economic effect would be short-term and would not be measurable. Also, for any short-term displacement of an activity, there would be several substitute sites and opportunities on nearby NFS lands. A substitute site may not be available for all short-term displacement of authorized commercial uses of NFS lands.

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