

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the potential environmental consequences of the alternatives examined in detail, and the No Action Alternative. The Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR 1500-1508) define three types of impacts from a proposed action to be considered in the environmental analysis: direct, indirect, and cumulative. This chapter addresses the direct and indirect impacts. Cumulative impacts are addressed in Chapter 5. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action but take place later in time or removed in distance but are still reasonably foreseeable actions.

The impact analysis is organized in order of the resource categories described in Chapter 3. Under each resource the order of analysis is:

- No Action Alternative;
- Proposed Power Plant Site;
- Alternative Power Plant Site;
- Proposed Transmission Line Alignment; and
- Alternative Transmission Line Alignment;
 - For some resources additional segment specific analysis follows the overview of impacts for the proposed and alternative transmission line alignments.

Following the analysis for each action, a significance determination is presented. If it was determined that impacts would be significant, potential mitigation measures are suggested. In addition to these measures, the specific best management practices (BMPs) described in Chapter 2 (Table 2.4-1) that Basin Electric would implement are referenced in each resource area impact analysis where applicable.

4.2 METHODOLOGY

4.2.1 Assessment of Impacts

An interdisciplinary team followed a structured process to analyze the potential environmental impacts, or effects, resulting from the proposed and alternative actions as described in Chapter 2.

Additional issues related to specific resources were identified through public and internal scoping. Issues are evaluated according to significance criteria developed for each resource. Significance criteria provide a method for describing the potential impacts on the key resources and issues in a consistent manner and also establish thresholds for determining the significance of impacts. Significance criteria combine several factors that describe environmental effects in terms of magnitude, duration, extent, and likelihood of the effect. Each of these major factors was divided into several sublevels in order to qualify individual effects. Resource-specific ratings criteria are presented within this chapter at the beginning of each resource section.

These major factors and their sublevels are:

Magnitude (how large an effect will be)

- Major – Causes a distinct change in the condition of a resource;
- Moderate – Causes measurable change in the condition of a resource but does not change the overall aspect of the resource; and
- Minor – Little evidence of change in the condition of a resource.

Duration (how long an effect will occur). This factor can also be considered in terms of frequency (how often an effect will occur).

- Long-term – Effects lasting beyond the construction and a reasonable rehabilitation or mitigation phase. For certain biological resources, long-term effects may be those lasting longer than one year or during critical periods. For other resources, long-term effects are generally identified as effects lasting longer than 60 months;
- Medium-term – Effects lasting beyond the completion of the construction phase but not beyond a reasonable amount of time to allow for rehabilitation or mitigation. This generally does not exceed 60 months; and
- Short-term – Effects occurring during part or all of the construction phase of the project (periods vary for proposed Dry Fork Station and proposed transmission line).

Extent (geographic scale of an effect)

- Large – Across large portions of the analysis area, or affecting large portions of a particular localized resource within the analysis area;
- Medium – Across portions of the analysis area, or affecting portions of a particular resource in the analysis area, including the immediate surrounding area; and
- Small – Effects limited to a portion of the analysis area, or to a limited portion of a particular resource in the analysis area.

Likelihood (potential for an effect to occur)

- Probable – The effect will certainly or almost certainly occur;
- Possible – The effect may occur, but is uncertain; and
- Unlikely – The effect is not expected to occur.

Each resource contains a specific description of the meaning of each rating relevant to the issues identified. In addition to these sublevels, any factor may have “no impact” identified.

4.2.2 Significance Determination

The CEQ regulations on NEPA provide a list of factors to be considered in determining significance if an impact is identified. These factors are presented in the text box on the following page. Similar to the identification of impact ratings criteria, significance thresholds were identified for each resource category. Following the effects analysis for each action, a significance determination was made to determine that impacts, if any, were significant or less than significant.

4.3 SOILS, GEOLOGY, AND MINERALS

Impacts to soils, geology, and minerals are interrelated and discussed as a group in this section. The BMP that applies is GS-M1.

4.3.1 Impact Criteria

To determine if an action may cause a significant impact, both the context of the action and the intensity of the impact are considered. For actions such as those proposed in this document, the context is the locally affected area, and significance depends on the effects in the local area. The intensity of the impact is primarily considered in terms of the relative land area disturbed based on the required construction technique, any unique characteristics of the area (e.g., mineral resources), and the degree to which the proposed project may adversely affect such unique resources.

Soils

Impact analysis on the soil resource involves the evaluation of potential effects on specific soil attributes, such as increasing the potential for erosion and compaction by construction activities. Unlike large-scale geologic conditions, effects on the soil resource occur on discrete areas of land.

Geology and Minerals

Impact analysis on the geologic resource by the proposed project involves the evaluation of potential effects to critical geologic attributes such as access to mineral and energy resources, destruction of unique geologic and mineral features, vibratory ground motion induced by seismic activity, subsidence induced by groundwater withdrawal, and mass movement or ground shifting induced by the construction of facilities. The impact analysis includes the analysis of large-scale geological conditions such as earthquakes and volcanism and the probable effects on the proposed infrastructure. The presence of mineral resources and the probable impact that the project could have on their availability in the future was also analyzed.

Tables 4.3-1 and 4.3-2 summarize the significance criteria used in the evaluation of potential impacts for soils, geology, and minerals. The following definitions were developed to assess the significance of potential project effects.

CEQ Regulations on Significance (40 CFR 1508.27)

The rating of an impact as "significant" in NEPA requires consideration of both the context and intensity of the impact.

Context: The significance of an action must be analyzed in several contexts, including society as a whole, the affected region, the affected interests, and the locality. Both short- and long-term effects on an action should be analyzed.

Intensity: Intensity refers to the severity of an impact. In evaluating the intensity of an impact of the proposed action, the following should be considered:

- Impacts that may be both beneficial and adverse;
- Effects on human health and safety;
- Unique characteristics of the geographic area;
- Highly controversial effects;
- Highly uncertain or risky effects;
- Potential for the action to set a precedence for future actions with significant effects;
- Cumulative effects;
- Adverse effects on significant scientific, cultural, or historic resources;
- Adverse effects on a threatened or endangered species or its habitat; and
- Whether the action violates or threatens a federal, state, or local law or requirement.

Table 4.3-1 – Issues and Significance Criteria for Soils, Geology, and Minerals – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be significant if it exceeded any applicable regulation including permit requirements or if the impact would probably result in a long term, major effect.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Surface geology (location of clinker and other unstable surface deposits) • Geologic hazards (faults, areas of mass movement) • Mineral development facilities (coal mines, oil and gas wells, pipelines, and other infrastructure) • Wind erosion hazard, primarily during and immediately after construction • Water erosion hazard, primarily during and immediately after construction 	Magnitude		
	Major	Significant change in ground elevation due to site preparation, disturbance of soil susceptible to severe wind or water erosion hazards, and significant impact to clinker deposits associated with Moyer Springs.	Change in surface elevation, destruction of outcrops, potential to induce severe erosion.
	Moderate	Loss of land to the power facility.	
	Minor	Minimal to no impact to soil, geological, and/or mineral resources.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period up to 60 months.	
	Short-term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Would impact areas outside of the EIS Study Area.	Evaluation of soil conditions and estimation of extent of impact.
	Medium	Impact limited to EIS Study Area.	
	Small	Impact limited to immediate project site.	
	Likelihood		
	Probable	The impact will occur based on characteristics of soil and geologic formations.	Evaluation of soil conditions and construction procedures.
	Possible	Moderate potential for impact to occur.	
Unlikely	Little or no potential for impact to occur.		

4.3.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.3.3 Power Plant

4.3.3.1 Proposed Site

Construction

Under the proposed action, Dry Fork Station construction activities would occur for approximately 42 months (short-term) and would be located in an area with gentle slopes, which would minimize the volume of soil that needs to be moved as part of the site preparation and the erosive potential of storm water runoff events.

Table 4.3-2 – Issues and Significance Criteria for Soils, Geology, and Minerals – Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be determined significant if it has the potential to extensively alter soils or geology so as to affect its integrity and/or create unstable onsite or offsite conditions. An impact is also considered significant if it results in a violation of any applicable regulation or standard.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Surface geology (location of clinker and other unstable surface deposits) • Geologic hazards (faults, areas of mass movement) • Mineral development facilities (coal mines, oil and gas wells, pipelines, and other infrastructure) • Wind erosion hazard, primarily during and immediately after construction • Water erosion hazard, primarily during and immediately after construction 	Magnitude		
	Major	Soil contamination, induced soil erosion, and mass movement by activities related to construction, operation, and maintenance of the proposed action.	Soil analyses, observation of soil erosion, and observation of mass movement.
	Moderate	Soil properties and site features are such that mitigation measures would be effective in controlling erosion and sedimentation within acceptable levels.	
	Minor	Construction and operation activities would result in low potential for soil erosion and mass movement with low to moderate erosion hazard. Soil erosion levels would be held to near normal background levels during and following construction.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period (18 – 60 months).	
	Short-term	Short period during construction or startup lasting 18 months or less.	
	Extent		
	Large	Impact to a large area/watershed.	Evaluation of soil conditions and estimation of extent of impact.
	Medium	Impact limited to ROW and immediately surrounding area.	
	Small	Impact limited to ROW.	
	Likelihood		
	Probable	Presence of susceptible soils and active faults and formations that are susceptible to mass movement.	Evaluation of soil conditions and construction procedures.
	Possible	Construction and clearing take place on erodible soils that have moderate revegetation potential.	
Unlikely	Little or no potential for the impact to happen.		

Ground disturbing activities would be conducted in two phases. Phase 1 of site grading would result in approximately 80 acres of disturbance for a duration of approximately 10 weeks. The duration under Phase 2 would be approximately 12 weeks and result in approximately 120 acres of disturbance. The total disturbed area is estimated to be 120 acres and may be adjusted as construction lay down areas and associated activities are finalized.

During the initial Phase 1 grading activities, the elevation to the base of the turbine generator and boiler areas foundations would be established. This would minimize future excavation during installation of the pilings and foundations. Temporary storm water retention ponds would be constructed as required. Drainage around disturbed areas would be established during Phase 1 grading operations to direct runoff to the storm water ponds and to prevent runoff to natural drainages.

Soils would also be disturbed during construction of the switchyard. Construction of the switchyard would occur during the Phase 2 grading work. During construction, earth-moving activities conducted for site preparation and civil construction would remove vegetation and cause surface disturbances to soil. Disturbed soil would be susceptible to water erosion and could be transported as suspended solids to nearby drainages and deposited as sediment in stream channels and floodplains. These impacts would most likely occur during the initial phases of construction prior to the completion of storm water retention measures. Discharge of stormwater during the construction period for the plant site would be permitted through a National Pollutant Discharge Elimination System (NPDES) large construction general permit (WYR10-0000).

Soil compaction from heavy equipment would increase surface runoff in certain areas increasing the amount of sediment capable of being transported in and surrounding disturbed areas. Accidental releases of hazardous materials including fuels, lubricants, and other chemical spills are possible.

Two stormwater ponds would be constructed on the plant site as part of the proposed action. Drainage around the switchyard would be directed to the storm water ponds. Various electrical duct banks would be installed during construction. The depths and widths would vary depending on location and conduit requirements. Soil impacts would result from construction of the power plant, storage areas, associated processing facilities, research facilities, parking areas, access roads, and the on-site railroad loop. During construction, soil would be removed from areas where the foundations of the structures would be sited. This soil would be placed at a temporary storage site and be protected from erosion and runoff, for reuse as topsoil replacement or as fill. Soils impacts would be long-term for areas converted into impervious surface areas (e.g., structure, pads, and parking). Temporary soil compaction would occur in areas of temporary road construction and heavy equipment storage, soil-blowing and localized erosion would be likely during construction from equipment movement. Construction-related impacts to soils in areas not converted to impervious surfaces would be temporary and these areas would be restored after construction is completed.

Hazardous material spills could potentially affect on-site soil. Hazardous materials commonly used during construction include oils, paints, solvents, and lubricants. The use of segregation, storage, labeling, and adequate handling, as well as secondary containment and other spill prevention techniques, would minimize the potential for a spill to occur. Should a spill occur, it would be contained and would not be expected to permanently impact soil characteristics such as pH, porosity, humidity, and texture.

The majority of the excavated material would be used as fill during the site work. A minor amount would be used as liners for ditches and as a clay liner within the facility retention pond. A soil stockpile would be dedicated for final plant site reclamation.

It is anticipated that a temporary access point would be obtained off State Highway (SH) 59 for the initial site work. (At the present time, there is no aggregate-surfaced road from SH 59 to the proposed power plant site.) This access point and internal access road would be maintained with aggregate surfacing. The road would be used until the permanent access point is constructed during Phase 2. Erosion control measures and other BMPs would minimize erosion of these surfaces and eliminate the transport of eroded materials onto native soils outside of the work area. See Table 2.4-1 for the specific BMPs.

Construction equipment also has the potential to compact soil, reducing the porosity and conductivity of the soil. Such compaction may slightly increase the amount of surface runoff in the project area. The underlying soil in the area of the site is characterized by high runoff potential and relatively high wind erosion potential. Retention of stormwater runoff, stabilization of disturbed soils as soon as technically feasible after disturbance, and erosion control BMPs would minimize the likelihood of impacts extending beyond the proposed Dry Fork Station site.

There would be no impact to the availability of coal in the area from construction of the power plant and other facilities mostly because extraction of this coal under the site is not currently economically favorable.

Aggregate and other geologic resources (e.g., sand) would be required to support construction activities; these resources are readily available near the proposed plant site and the quantities required for construction of the power plant would not have a noticeable effect on their availability.

The relatively flat surface topography of the power plant site precludes any potential impacts from landslides or other slope failures during construction. Similarly, since the area is not considered to be seismically active and Campbell County has a Uniform Building Code (UBC) zone 1 classification, it is not expected that seismic activity would affect construction of the power plant.

Impacts from the construction of the proposed power plant on soils, geology, and minerals would be less than significant.

Operation

Once the proposed power plant becomes operational, no impacts to geologic resources would be expected. The site's relatively flat surface topography and lack of karst geology precludes any potential impacts from landslides, other slope failures, or sinkhole development during operation. Similarly, since the area is not seismically active and only minor earthquakes have historically affected the project area, it is not expected that seismic activity would affect operation of the power plant. Hazardous materials commonly used during operation of a power plant include oils, paints, solvents, and lubricants. The same operational procedures to prevent spills and to minimize the consequences would be implemented during the operational phase.

Impacts from the operation of the proposed power plant on soils, geology, and minerals would be less than significant.

4.3.3.2 *Alternative Site*

Construction

The construction of the alternative power plant would have similar impacts on soils, geology, and minerals as described for the proposed power plant.

Impacts from the construction of the alternative power plant on soils, geology, and minerals would be less than significant.

Operation

Operation of the alternative power plant would have similar impacts on soils, geology, and minerals as described for the proposed power plant.

Impacts from the operation of the alternative power plant on soils, geology, and minerals would be less than significant.

4.3.4 *Transmission Line*

4.3.4.1 *Proposed Alignment*

Construction

Soils impacts would primarily be limited to specific areas within the 125-foot-wide construction Right-of-Way (ROW) that would include disturbances along the ROW, support structures, and staging areas. Impacts to soils would be minimized through the use of rubber-tired equipment when feasible and the preservation of existing vegetation. Erosion control BMPs would localize soil impacts to those areas where disturbances are required such as at the location of H-frame structures or where existing access roads are improved. Stabilization and revegetation of disturbed areas occurring as soon as technically feasible following disturbance would minimize soil erosion during and following construction. Where access roads are not present, overland travel by construction vehicles would cause localized minor soil compaction in these areas. The magnitude of soil impacts would be moderate, medium-term in duration, medium in extent, with a possible likelihood of occurring.

Because of the low relief across most of the segments of the proposed and alternative alignments, the potential for slope failure (a geologic hazard) would be insignificant.

Seismic risks are low in the general area of the proposed transmission line. Project designs for the existing seismic conditions would make the likelihood of seismic activity impacting the transmission line unlikely.

No active mining would be impacted. No impacts to mineral resource availability would occur from construction of the transmission line. The proposed alignment would not be located adjacent to any active or inactive uranium mine tailing areas. Although the project would be

constructed near conventional oil and gas and Coal Bed Methane (CBM) wells, the selected alignment would not preclude exploration and development of these resources. The magnitude of impacts to mineral resources would be minor, short-term in duration, and would be unlikely to occur.

The implementation of BMPs for the use, storage, and disposal of hazardous substances and wastes would reduce the potential for an accidental release to soils. BMPs put in place in the case of a release of hazardous materials would result in the timely cleanup of released materials and the minimization of the extent of impact. The use of hazardous material BMPs would make the magnitude of a release of hazardous materials minor, small in extent, with a moderate to unlikely potential for an impact to occur to soils.

Impacts to soils, geology, and minerals from construction of the proposed alignment would be less than significant.

Operation

Erosion control BMPs utilized during routine maintenance activities during operation would minimize the potential for soil erosion and deposition onto adjoining areas. Soil erosion impacts would be minor, short-term in duration, small in extent, and unlikely to occur.

Seismic risks are low to moderate in the general area of the proposed transmission line. Project designs for the existing seismic conditions would make the likelihood of an impact occurring unlikely.

The implementation of BMPs for the use, storage, and disposal of hazardous substances and wastes would reduce the potential for an accidental release to soils during operational activities along the transmission line alignment.

Impacts to soils, geology, and minerals during operation of the proposed alignment would be less than significant.

4.3.4.2 Alternative Alignment

Construction/Operation

Impacts to soils, geology, and minerals associated with construction and operation of the alternative alignment would be similar to those discussed above for the proposed alignment. Impacts from the construction and operation of the alternative alignment on soils, geology, and minerals would be less than significant.

4.3.5 Conclusions

The use of project design features and BMPs would minimize the likelihood, magnitude, duration, and extent of impacts to soils and geology during construction and operation of the Dry Fork Station at either the proposed or alternative site, and also for the proposed or alternative transmission line alignments. Given implementation of design features and BMPs, direct and indirect short- and long-term impacts would be less than significant for soils and geology.

Mineral resource impacts, excluding conventional oil and gas and CBM exploration and development, may occur in the future if mineable mineral resources are determined to be present under the proposed or alternative transmission lines. The magnitude of impacts to mineral resources would be minor, long-term in duration, and would have a probable likelihood of occurring during the operation of the proposed or alternative transmission line alignments. Overall, the direct and indirect short- and long-term impacts to mineral resources would be less than significant.

4.4 WATER RESOURCES

This section discusses the potential effects on surface water and groundwater resources from the proposed action and alternatives. The methodology for determining effects is presented below, followed by a description of the effects of the proposed action and alternatives. This section also presents a discussion of the potential impacts associated with construction and operation of the proposed and alternative transmission line alignments. BMPs related to water include WR-M1 and WR-M2 (see Table 2.4-1).

4.4.1 Impact Criteria

Tables 4.4-1 through 4.4-3, found on the following pages, summarize the major issues and the significance criteria used to evaluate potential impacts from the project components on surface water and groundwater resources. Potential impacts to surface water resources would primarily be a degradation of water quality. An impact would be considered significant if it were associated with an exceedance of any applicable regulation, if it were to last for the duration of the project, or if it were to cause measurable degradation in the quality or quantity of surface water. Potential impacts to groundwater resources involve water quality and availability. Impacts to availability may result from withdrawals by the proposed well field. Results of the groundwater analyses apply to both the proposed and alternative power plant sites because they are only about 1.5 miles apart and the proposed well field would be located in this general area.

4.4.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.4.3 Power Plant

4.4.3.1 Proposed Site

Construction

The maximum area of surface disturbance for plant facilities would include approximately 120 acres within the 353 acres at the proposed Dry Fork Station site. Project components common to the proposed and alternative power plant that could affect surface water and groundwater resources include the pulverized coal boiler; solid waste disposal landfill (approximately 63 additional acres to accommodate the ash waste in addition to the power plant surface

disturbance); storm water system; water supply (groundwater well field); wastewater evaporation pond; and access roads.

Table 4.4-1 – Issues and Significance Criteria for Surface Water Resources – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with exceedance of any applicable regulation or if it would last longer than 60 months or if it causes degradation in the quality or quantity of surface water, resulting in violation of applicable regulations.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Floodplains • Effects to surface water quality caused by sediment input from construction activities • Effects of selenium and metals in wastewater or storm water on surface waters • Offsite effects to water quality • Effects of the proposed ash disposal methods on surface water 	Magnitude		
	Major	Violation of applicable regulations or standards resulting from contamination or degradation of the quality of water bodies.	Results of monitoring programs, noncompliance with permit requirements, complaints by third parties.
	Moderate	Temporary increase in sedimentation due to increased runoff.	
	Minor	Minimal to no impact to surface water resources.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period up to 60 months.	
	Short-term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Impact to a large area/watershed.	Results of monitoring programs and field observations.
	Medium	Impact limited to the EIS Study Area.	
	Small	Impact limited to the immediate project site.	
	Likelihood		
	Probable	The impact will occur based on modeling results and monitoring data.	Efficiency of mitigation measures.
	Possible	Moderate potential for impact to occur.	
Unlikely	Little or no potential for impact to occur.		

Surface Water

During construction, earth-moving activities conducted for site preparation and civil construction would remove vegetation and cause surface disturbances to soil. Disturbed soil would be susceptible to water erosion and could be transported as suspended solids to nearby drainages, and deposited as sediment in stream channels and floodplains. These impacts would most likely occur during the initial phases of construction prior to the completion of storm water retention measures. Discharge of stormwater during the construction period for the plant site would be permitted through a NPDES large construction general permit (WYR10-0000).

Soil compaction from heavy equipment would increase surface runoff in certain areas increasing the amount of sediment capable of being transported in and surrounding disturbed areas. Accidental releases of hazardous materials including fuels, lubricants, and other chemical spills are possible.

Table 4.4-2 – Issues and Significance Criteria for Surface Water Resources – Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with exceedance of any applicable regulation or if it would last longer than 60 months or if it causes degradation in the quality or quantity of surface water, resulting in violation of applicable regulations.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Crossings of surface water (streams, rivers, lakes) • Floodplains • Effects to surface water quality from sediment input from construction activities 	Magnitude		
	Major	Violation of applicable regulations or standards.	Results of monitoring programs, noncompliance with permit requirements, complaints by third parties.
	Moderate	Temporary increase in sedimentation due to increased runoff. Contamination or degradation of the quality or quantity of surface water bodies at a level or acreage below applicable regulations or standards.	
	Minor	Minimal to no impact to surface water resources.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period (18 months) but not exceeding 60 months.	
	Short-term	Short period during construction or startup lasting 18 months or less.	
	Extent		
	Large	Impact to a large area/watershed.	Results of monitoring programs and field observations.
	Medium	Impact limited to ROW and immediately surrounding area.	
	Small	Impact limited to ROW.	
	Likelihood		
	Probable	The impact will occur based on modeling results and monitoring data.	Efficiency of mitigation measures.
	Possible	Moderate potential for impact to occur.	
Unlikely	Little or no potential for impact to occur.		

Three stormwater ponds would be constructed on the plant site to be used during operation of the Dry Fork Station; two for stormwater from the plant area, and one for stormwater at the ash landfill. Other temporary ponds would be constructed as necessary for stormwater management at the plant site during construction.

Planned erosion control and stormwater retention measures (see BMPs in Table 2.4-1) would minimize the magnitude of impacts creating a minor to moderate effect on surface water resources; potential impacts would be limited to the Dry Fork of the Little Powder River. Water quality and sedimentation effects would be short-term in duration, medium in extent, with a possible likelihood of occurrence during construction. Use of staging areas and implementation of a Spill Prevention and Control Countermeasures (SPCC) Plan concerning the use of hazardous materials within areas protected by standard erosion control and stormwater retention measures would result in a minor potential magnitude from accidental releases of hazardous materials.

Temporarily disturbed areas would be reclaimed and revegetated, resulting in increased infiltration and decreased surface runoff.

Table 4.4-3 – Issues and Significance Criteria for Groundwater – Power Plant and Transmission Line

Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if associated with an exceedance of any applicable regulation or if it were a long-term effect of major magnitude.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Proposed water source and the effects of its use on groundwater Effects on groundwater of selenium and metals in wastewater or storm water Effects of proposed ash disposal methods on groundwater 	Magnitude		
	Major	Major decrease in water level, contamination of groundwater, violation of applicable regulations, impairment of neighboring wells.	Results of aquifer tests, results of water level monitoring, complaints by third parties whose wells show lower yield as a result of water use by the proposed action.
	Moderate	Minor decrease in water level.	
	Minor	Minimal to no impact to groundwater resource.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period up to 60 months.	
	Short-term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Impact to a large area/watershed.	Results of aquifer tests, results of water level monitoring, complaints by third parties whose wells show lower yield as a result of water use by the proposed action.
	Medium	Impact limited to project site and ROW for transmission line, and project site and EIS Study Area for the Dry Fork Station.	
	Small	Impact limited to immediate project site.	
	Likelihood		
	Probable	Impact will occur based on modeling results and monitoring data.	Results of aquifer tests, water level, and water quality monitoring.
	Possible	Moderate potential for impact to occur.	
Unlikely	Little or no potential for impact to occur.		

Groundwater

During the construction of the proposed Dry Fork Station power plant, the shallow groundwater aquifers could be adversely impacted by potential spills and releases of hazardous materials. Several substances that have the potential to cause contamination of soil and shallow groundwater resources would be present at the site for the duration of the construction including fuels, lubricant oil, solvents, and paints.

Impacts to soil permeability and shallow-groundwater recharge due to soil compaction from heavy equipment in temporarily disturbed areas would be minor in magnitude, short-term in duration, small in extent, and unlikely to occur. Following construction, disturbed areas would be reclaimed and revegetated, which would reduce soil compaction and restore aeration and permeability.

Water for construction would be pumped from the Lance-Fox Hills aquifer at a depth of approximately 3,700 feet. Basin Electric estimates that approximately 125,000 gallons per day

(0.4 acre-feet per day) would be required for dust control, concrete curing, and hydrostatic testing of pipelines. This quantity would be considerably less than that needed for operations; the Wyoming State Engineer's Office (WSEO) has concurred with Basin Electric that sufficient water is available onsite for operations (discussed below). Therefore, no impact to groundwater availability would be expected from groundwater withdrawals during construction. Impacts from this groundwater withdrawal would be moderate in magnitude, short-term in duration, medium in extent, and possible to probable in likelihood of occurrence. If the groundwater extraction facilities were not ready at the time of construction, water would be trucked in on a daily basis.

Impacts to surface and groundwater during construction of the proposed power plant would be less than significant.

Operation

Surface Water

During plant operation, storm water would be directed to two onsite storm water detention ponds where the water would be allowed to evaporate. Berms and swales would direct storm water to the detention ponds. Post-construction runoff would not exceed pre-construction conditions (Basin Electric 2006a).

Surface water control structures would be used to divert surface water flows around active landfill areas, and also to collect and contain surface water runoff from active landfill areas. Collected water from this area would be used for dust control at the ash landfill when available.

The facility is designed to be a zero-liquid discharge facility. Wastewater from the facility would consist of sanitary wastewater and process wastewater. An onsite leach field system would be used for disposal of sanitary wastes (Basin Electric 2007b). Process wastewater from the power plant would be generated at a rate of approximately 134 gallons per minute (gpm) and would be collected in an onsite wastewater pond with dimensions of 150 feet by 300 feet. Process wastewater would be used in the dry flue gas desulfurization (FGD) system and for dust control at the landfill. According to the proposed wastewater balance, the use of wastewater would essentially equal input, because the water would be used at a rate of approximately 119 gpm for the dry FGD system and approximately 15 gpm for dust control at the landfill. The water level in the wastewater pond would therefore be expected to be fairly constant (Basin Electric 2007b), not allowing for some minor evaporation.

The projected metals content of the process wastewater effluent is shown in Table 4.4-4. These trace levels of metals would not be expected to cause any impact to the FGD system or contribute noticeably to metal concentrations in the ash landfill.

The impact to surface water would be minor in magnitude, long-term in duration, medium in extent, and have a probable likelihood of occurring. Minor surface water quality impacts due to suspended solids are possible along access roads where storm water drainage is not retained. During operation, discharge of stormwater would be permitted through a NPDES General Industrial Storm Water Permit (WYR00-000).

Table 4.4-4 – Estimated Metals Concentrations in Process Wastewater

Parameter (concentration in parts per million)	Wastewater from Pond	Parameter (concentration in ppm)	Wastewater from Pond
Iron	6.99	Silver	N/A
Lead	<0.020	Strontium	0.295
Lithium	N/A	Thalium	< 0.013
Manganese	<0.126	Tin	N/A
Mercury	<0.001	Titanium	N/A
Molybdenum	N/A	Vanadium	N/A
Nickel	<0.479	Zinc	< 0.056
Selenium	<0.087		

N/A indicates that the data are not available
Source: Basin Electric 2007b

Impacts from the operation of the power plant on surface water quality and quantity would be less than significant.

Groundwater

Basin Electric estimates that the proposed Dry Fork Station would require water at a rate of 571 gpm. Calculations using a conservative overestimation for the power plant water requirement indicate that water storage of 126,000 acre feet (total requirement over 60 years of plant life) is available within a two and one half mile radius of the plant in the Lance-Fox Hills aquifer (WSEO 2005). Sufficient water supply is reportedly present at up to approximately twice the proposed usage amount. In early 2005, a water supply and yield analysis was carried out by Western Water Consultants (WWC 2005). This analysis included a field of three wells screened in the Lance-Fox Hill aquifer to supply an estimated demand of 1,300 gpm (actual demand would be 571 gpm) of water that the Dry Fork Station power plant would require. This analysis assumed that the three proposed wells would have the same yield of 450 gpm each and that their hydrologic characteristics would be the same as those of the closest existing well; under these assumptions it was determined that the drawdown would be large enough that the aquifer would be under unconfined conditions in the area of the well screen. Under these conditions, it was estimated that the Lance-Fox Hill aquifer would be capable of providing the estimated water demand for a period of 60 years. The WSEO confirmed the results of this analysis in a formal response adding that the Lance-Fox Hill aquifer is especially suitable for industrial use due to the low quality and high temperature of its waters (WSEO 2005).

WSEO requires water level monitoring for some of the production wells. This monitoring would reduce the potential for impacts to other users of the Lance-Fox Hills aquifer. Impacts from groundwater withdrawal from the Lance-Fox Hills aquifer would be minor in magnitude, long-term in duration, large in extent, and have a probable likelihood of occurrence. Impacts to the Lance-Fox Hills aquifer would be less than significant.

The ash landfill is currently estimated to cover approximately 63 acres, have a total capacity of 5.4 million cubic yards and a minimum of 5 feet of separation between the base of the landfill and the groundwater table. Basin Electric has conducted leaching tests and computer modeling of the potential leaching of metals or other contaminants from the landfill. These studies indicate that no effects to the shallow groundwater are expected (Basin Electric 2007). Thus, no impact to the groundwater resource by leaching from, or infiltration through, the ash landfill would be

expected. In addition, groundwater monitoring would be required by the state, thus further minimizing any potential impacts.

Groundwater resources in shallow aquifers in the area should remain available for typical livestock and domestic uses due to vertical separation and the presence of confining units between the shallow aquifers and the Lance-Fox Hills aquifer being utilized by the power plant well field. Thus, there would be no impacts to aquifer systems above the Upper Hell Creek confining unit.

4.4.3.2 *Alternative Site*

Construction

Surface Water

Given the proximity of the proposed and alternative power plant sites, impacts to surface water resources from construction at the alternative site would be the same as those described for the proposed power plant.

Groundwater

Impacts on groundwater resources during construction would be the same as described for the proposed power plant.

Impacts to surface and groundwater during construction of the Dry Fork Station at the alternative site would be less than significant.

Operation

Surface Water

Impacts to surface water resources from the operation of the Dry Fork Station at the alternative site would be the same as described for the proposed power plant.

Impacts to surface and groundwater during construction of the Dry Fork Station at the alternative site would be less than significant.

Groundwater

Impacts to groundwater resources during operation of the Dry Fork Station at the alternative power plant site would be the same as described for the proposed power plant.

4.4.4 **Transmission Line**

4.4.4.1 *Proposed Alignment*

Construction

Potential impacts to surface water bodies from transmission lines are generally associated with the construction phase, when soil erosion may occur as a result of grading, vegetation clearing, excavation, and stockpiling of soil. The amount of sediment in surface runoff that can enter

streams is site specific and depends on the local characteristics as well as on the efficiency of BMPs implemented at the site.

Surface Water

The proposed and alternative transmission line alignments would cross a number of creeks and rivers. The larger, named water bodies are presented in Tables 3.4-1 and 3.4-2. There are other small unnamed washes and drainages that would be spanned that are not identified in the tables.

Potential impacts to surface water bodies include increased erosion and subsequent siltation due to construction activities. Although the exact placement of the structures has not yet been identified, surface water features would be spanned and structures would not be placed adjacent to surface water bodies, wetlands, and floodplains. These construction designs would minimize direct impacts to surface water features during construction. Where surface disturbances are unavoidable, measures called for in BMPs outlined in Table 2.4-1 (such as placement of erosion control devices along access routes, excavation areas, and equipment set up locations) would minimize the transport of sediment away from these areas into surface water. Based on the proposed engineering designs and BMPs, the magnitude of impacts should be minor, short-term, medium in extent, and have a possible likelihood of occurring.

Staging areas and spill management procedures would be practiced to avoid release of fuel, lubricants, and other hazardous chemicals present during the construction phase. The anticipated magnitude of impact to surface water from a hazardous material release is minor, short-term in duration, small in extent, with a moderate likelihood of occurring.

Construction of the proposed alignment would have a less than significant impact on surface water resources.

Groundwater

During construction, the release of small quantities of fuel, lubricants, and other hazardous chemicals is possible. Required spill prevention, spill cleanup response, designated fueling areas, equipment inspection and material disposal measures would minimize the impact of accidental release of hazardous materials to groundwater to the extent practicable.

The anticipated magnitude of impact to groundwater water from a hazardous material release is minor, short-term in duration, small in extent and unlikely to occur. Therefore, construction of the proposed alignment would have a less than significant impact on groundwater.

Operation

Surface Water

The operation and maintenance of a transmission line involves occasional site inspection and repairs. Less than significant impacts on surface water bodies are associated with the operations and maintenance of the proposed alignment. The potential impacts would be minor in magnitude, short-term in duration, small in extent, and unlikely to occur.

Groundwater

Vegetation control and associated use of herbicides, traffic on the access roads, and minor spills of hazardous materials from support vehicles could potentially introduce hazardous materials into soils that could infiltrate into groundwater, decreasing its quality. Hazardous material management procedures would minimize to the extent practicable the impact to groundwater from a release. The potential impacts would be minor in magnitude, short-term in duration, small in extent, and unlikely to occur. Therefore, operation of the proposed alignment would have a less than significant impact on groundwater and surface water resources.

4.4.4.2 *Alternative Alignment*

The alternative alignment presents similar hydrological conditions and would be within the same regional watersheds listed for the proposed alignment. Therefore, the potential impacts to surface water resources would be comparable. The 303(d)-listed rivers in the area of the project, Powder River and Prairie Dog Creek, would be crossed, and the same procedures to meet federal and state requirements would be imposed for these water bodies. No impact to the water quality of these or any other water bodies would be expected.

Construction/Operation

Surface Water

The surface water issues identified for construction and operation of the alternative alignment would be the same as for construction and operation of the proposed alignment.

Groundwater

The groundwater issues identified for construction and operation of the alternative alignment would be the same as for construction of the proposed alignment.

A less than significant impact to surface water and groundwater resources would occur during the construction and operation of the alternative alignment.

4.4.5 Conclusions

The primary impact to water resources from the Dry Fork Station construction and operation at either site would be the use of groundwater from the Lance-Fox Hills Aquifer. However, this resource has adequate capacity and it would not be depleted or significantly impacted by this project.

Federal and state permitting requirements, design features, and BMPs that would be implemented during construction and operation of the Dry Fork Station at either the proposed or alternative site, and for the proposed or alternative alignment, would control erosion and runoff of sediment into surface water bodies. Hazardous material BMPs for the use, handling, and response to releases would minimize or eliminate potential impacts to surface and groundwater resources.

4.5 AIR QUALITY

This section describes the air quality impacts for the No Action Alternative and for construction and operation of the proposed action and alternatives. Additional details are provided in the Basin Electric Dry Fork Station Air Construction Permit Application, hereinafter called the Air Permit Application (CH2M Hill 2005a).

4.5.1 Evaluation Criteria for the Proposed Power Plant

Construction and operation of the proposed Dry Fork Station would generate pollutant emissions as described in Chapter 3. The potential impacts to air quality are evaluated with respect to:

- Compliance with National Ambient Air Quality Standards (NAAQS);
- Compliance with Prevention of Significant Deterioration (PSD) increments;
- Compliance with the Clean Air Mercury Rule (CAMR) for mercury emissions and deposition;
- Visibility and regional haze in Class I areas;
- Nitrogen and sulfur deposition in Class I areas; and
- Greenhouse gas (GHG) emissions.

The impacts are characterized in terms of magnitude, duration, extent, and likelihood, based on the evaluation criteria shown in Table 4.5-1.

4.5.2 Evaluation Criteria for the Proposed Transmission Line

Construction and operation of the proposed Hughes Transmission Line would primarily generate PM emissions due to construction equipment operations and construction traffic. Potential impacts from construction and operation of the proposed transmission line are further characterized in terms of:

- Compliance with NAAQS; and
- Creation of nuisance fugitive dust.

Impacts are characterized in terms of magnitude, duration, extent, and likelihood, based on the evaluation criteria shown in Table 4.5-2.

4.5.3 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

Table 4.5-1 – Issues and Significance Criteria for Air Quality – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with violation of the NAAQS beyond the fenced property boundary, regardless of duration or extent. An effect would be determined to be significant if it results in a violation of the Class I guideline of less than 5 percent decrease in visibility in a designated Class I area for a period of time exceeding 3 days in any single year.			
	Criteria	Definition	Measurement	
<ul style="list-style-type: none"> • Effects to primary downwind areas. • Attainment status for air quality standards. • Identification of any PSD Class I and sensitive Class II areas. • Air dispersion modeling (showing compliance with National Ambient Air Quality Standards [NAAQS] for CO, NO_x, SO₂, and particulates). • Long-range air quality effects, such as acid rain, Hg deposition, greenhouse gases, and air toxic emissions, including proposed efficiency of SO_x and Hg emissions control and a quantitative estimate of emissions for CO₂ and air toxics. • Dust related to ash disposal and other sources. • Cumulative effects to air quality, especially considering existing effects. 	Magnitude			
	Major	Violation of NAAQS or Class I guideline.	Results of air quality modeling (ISCST and CALPUFF).	
	Moderate	Air quality impacts near the NAAQS or Class I guideline.		
	Minor	Air quality impacts well below NAAQS and Class I guideline.		
	Duration			Project construction and operation schedule.
	Long-term	Longer than 60 months.		
	Medium-term	Impact duration greater than construction period up to 60 months.		
	Short-term	Short period during construction or startup lasting 42 months or less.		
	Extent			Results of air quality modeling (ISCST and CALPUFF).
	Large	Impact is to a large area/airshed.		
	Medium	Impact is limited to project site and the EIS Study Area.		
	Small	Impact is limited to immediate project site.		
	Likelihood			Results of air quality modeling (ISCST and CALPUFF) and construction and operations procedures and schedule.
	Probable	Impact will occur based on modeling results.		
	Possible	Moderate potential for the impact to occur.		
Unlikely	Little to no potential for the impact to occur.			

Table 4.5-2 – Issues and Significance Criteria for Air Quality - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if the project would result in or contribute to a violation of the Wyoming Air Quality Standards and Regulations.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Fugitive dust caused by construction traffic. 	Magnitude		
	Major	Violation of the Wyoming Air Quality Standards and Regulations.	Evaluation of emissions, including dust generation from each phase of activity.
	Moderate	Air quality impacts are approaching the Wyoming Air Quality Standards and Regulations.	
	Minor	Air quality impacts are well below the Wyoming Air Quality Standards and Regulations or result in offsite transport of fugitive dust.	
	Duration		
	Long-term	Longer than 60 months.	Daily construction activity schedule.
	Medium-term	Impact duration greater than construction period (18 months) but not exceeding 60 months.	
	Short-term	Short period during construction or startup lasting 18 months or less.	
	Extent		
	Large	Impacts entire transmission line study area or entire county.	Daily construction activity schedule.
	Medium	Impact is within the ROW and immediately surrounding area.	
	Small	Impact is limited to immediate project site.	
	Likelihood		
	Probable	Impact is very likely to occur.	Evaluation of emissions from each type of activity.
	Possible	Moderate potential for impact to occur.	
Unlikely	Little to no potential for impact to occur.		

4.5.4 Power Plant

Potential impacts to air quality from construction and operation of the Dry Fork Station at the proposed and alternative sites would be the same since the two sites have similar characteristics and would be located in the same general area.

Construction

Construction activities would generate pollutant emissions that would affect regional air quality. As with many construction projects, the majority of emissions are from fugitive dust generated by travel of construction equipment and other vehicles on unpaved roads; movement of vegetation and soils by grubbers, graders and loaders; and windborne emissions from cleared work areas. Air quality impacts from these activities would be minor in magnitude, short-term in duration, small in extent, and probable. Combustion of fossil fuels (diesel, gasoline, propane) in construction equipment, delivery trucks, and commuter vehicles would also contribute to the

overall emissions; however, the air quality impacts from these pollutant emissions are expected to be minor in magnitude and extent, short-term in duration, and probable. Impacts on Class II regions from construction of the Dry Fork Station would be minor in magnitude, short-term in duration, moderate in extent, and probable.

Operations

Estimated annual emissions are included in the Air Permit Application for all point and fugitive emissions sources from operation of the proposed Dry Fork Station, including the main pulverized coal (PC) boiler, material-transfer systems, and auxiliary equipment. The Dry Fork Station would have material-transfer operations for coal, fly ash, FGD waste, lime, sorbent (activated carbon), and ash disposal. Annual emissions were conservatively estimated based on a 100 percent capacity factor (full load operation for 8,760 hours per year). Detailed emission calculations are provided in the text and in the Air Permit Application (CH2M Hill 2005a).

The combined annual emissions of regulated air pollutants are shown in Table 4.5-3 along with the corresponding PSD significance rates. As this table shows, with the exception of lead, mercury, and hazardous air pollutants (HAPs), regulated pollutant emission rates would exceed annual PSD significance levels.

Table 4.5-3 – Total Annual Emission Rates for Power Plant Operations

Pollutant	Potential Annual Emissions (tpy)	PSD Significance Rate (tpy)	Exceeds PSD Significance
Acid Gases (HF, HCL)	25.0	3	yes
Beryllium	0.004	0.0004	yes
CO	2456	100	yes
Fluorides (as HF)	11.2	3	yes
HAP	9.95	25	no
Lead (Pb)	0.03	0.6	no
Mercury (Hg)	0.047	0.1	no
NO ₂	1162	40	yes
PM ₁₀	304.1	15	yes
Sulfur Oxides (SO ₂)	1626	40	yes
Sulfuric Acid Mist	40.6	7	yes
Volatile Organic Compounds (VOCs)	62.0	40	yes

Source: CH2MHill 2005

In addition to regulated pollutants, power plant operations would produce greenhouse gases, such as Carbon Dioxide (CO₂), methane, and nitrous oxide. The potential CO₂ emissions are 3.7 million tons per year (tpy) (CH2M Hill 2005a). Potential annual methane and nitrous oxide emissions are 25.3 tpy and 58.1 tpy, respectively.

4.5.5 Dry Fork Station BACT Determinations

Best Available Control Technology (BACT) determinations are presented in the Air Permit Application (CH2M Hill 2005a) for the emissions sources at the proposed Dry Fork Station, including the main PC boiler, material-transfer systems, and auxiliary equipment. Basin Electric may elect to install a sorbent injection system, with a material such as activated carbon, to reduce

mercury emissions from the main boiler. A summary of the BACT determinations for the affected emission sources is presented in Appendix D-2.

4.5.6 Methods to Evaluate Air Quality Impacts

As specified in the State Implementation Plan and Federal PSD Regulations, U.S. Environmental Protection Agency (EPA)-approved air models and analysis techniques are applied to estimate the regional and far field impacts of pollutant emissions. Estimated downwind concentrations for Class I and Class II areas are determined for PM₁₀, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), mercury (Hg), beryllium, fluorides, sulfates, and nitrates. Estimated impacts to visibility are also determined. A full description of the air quality impact analyses is included in the Air Permit Application (CH2M Hill 2005a).

The NAAQS are based on average pollutant concentrations measured over specific time intervals. For example, there are two NAAQS for CO – a 1-hour standard and an 8-hour standard. To satisfy the NAAQS for CO, the maximum measured pollutant levels in the region may not exceed the specified levels (40,000 and 10,000 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$], respectively) more than once per year. As another example, there is only one NAAQS for ozone (an 8-hour standard). To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area must not exceed the specified level (0.08 ppm). The EPA-approved air models are designed to produce results for direct comparison to the NAAQS.

As an additional metric to evaluate the air quality impacts of a new source, PSD regulations impose additional limitations known as PSD increments. PSD increments limit the amount of increase (in pollutant concentration levels) that a new source can impose above the existing background levels. PSD increments for Class I and Class II areas are codified in 40 CFR 52.166 and are listed in Table 4.5-4.

Table 4.5-4 – PSD Increments for Class I and Class II Areas

Pollutant	Averaging Time	Class I PSD	Class II PSD
		Increment ($\mu\text{g}/\text{m}^3$)	Increment ($\mu\text{g}/\text{m}^3$)
PM ₁₀	24-hour	4	30
SO ₂	Annual	2	20
SO ₂	24-hour	5	91
SO ₂	3-hour	25	512
NO ₂	Annual	2.5	25

Air quality in any given region is influenced, to some level, by all emission sources in the region. To estimate the impacts of any given pollutant, the initial approach is to apply a simple and conservative air model. If such a model indicates the increase in ambient pollutant levels would be less than the Significant Impact Level (SIL), then no further analysis is required. However, if the conservative air model indicates the SIL would be exceeded, then more sophisticated air model analysis is required to better estimate the impacts.

In summary, the ambient concentrations attributable to a new source must be combined with background levels to ensure the total air quality would satisfy the NAAQS. Ambient

concentrations attributable to a new source must also be evaluated on an individual basis to ensure they do not exceed PSD increments. A conservative air model analysis may be applied to determine whether the impacts would exceed SILs. If the predicted impacts would exceed an SIL, then a refined air model analysis is required; otherwise, the results of the simplified air model analysis are acceptable to characterize the impacts.

EPA-approved air models are also applied to evaluate air quality related values (AQRVs), for Class I areas. These models estimate visibility impacts and the rate of acid deposition. Metrics applied to evaluate the results are discussed in Section 3.5.

4.5.7 Operational Impacts on Air Quality in Class II Areas

The maximum predicted impacts from the sources associated with operation of the Dry Fork Station were modeled to determine impacts in Class II areas. The highest modeled impact for each pollutant and averaging period was used to assess impacts. Maximum modeled impacts are presented in Table 4.5-5. All predicted impacts were well below Class II area SILs, with the exception of the predicted impact for 24-hour SO₂, which exceeded the SIL and was further analyzed for total impacts, as described below.

Table 4.5-5 – Maximum Predicted Dry Fork Station Impacts

Pollutant	Averaging Period	Maximum Predicted Project Impacts (µg/m ³)	SIL (µg/m ³)
CO	1-Hour	85.2	2000
CO	8-Hour	14.9	500
NO ₂	Annual	0.3	1
SO ₂	3-Hour	21.1	25
SO ₂	24-Hour	5.8	5
SO ₂	Annual	0.4	1
PM ₁₀	24-hour	4.2	5
PM ₁₀	Annual	0.89	1
Pb	3-Month ^a	0.00009	N/A
Hg	24-Hour	0.0002	N/A
Beryllium	24-Hour	0.00004	0.0002
Fluorides	12-Hour	0.15	3,000,000 ^b
Fluorides	24-Hour	0.04	1,800,000 ^b
Fluorides	7-Day	0.04	500,000 ^b
Fluorides	30-Day	0.04	400,000 ^b

^a Impacts for 3-month/quarterly lead and 7-day fluoride were conservatively modeled with the 24-hour results within ISC-PRIME.

^b No significance level is established for fluorides, but the Wyoming Ambient Air Quality Standards (WAAQS) are shown for comparison to the modeled impacts for the project.

Nitrogen Dioxide

Emissions from the main boiler and the natural gas-fired auxiliary boiler were modeled together to predict the NO₂ impacts. The main boiler was modeled with exhaust parameters and emissions for the load condition (100 percent) that would persist for most of an annual period of operation. For the auxiliary boiler, an annual average emission rate for NO₂ was calculated from the potential annual hours of operation (2,000) for the source. The highest predicted annual NO₂

impact of $0.3 \mu\text{g}/\text{m}^3$ is well below the Class II SIL of $1.0 \mu\text{g}/\text{m}^3$. The analysis demonstrated that the Dry Fork Station Project would produce a less than significant annual NO_2 impact.

Sulfur Dioxide

The predicted SO_2 impacts from the Dry Fork Station Project exceed the 24-hour SIL, so a cumulative impact analysis for SO_2 was conducted. The impact area for a particular pollutant is “a circular area that extends from the source to the most distant point where approved dispersion model predicts a significant impact would occur” (Basin Electric 2006a). The impact area defines the area over which a more detailed full-impact analysis for air quality compliance was performed. For the project, the largest impact area for SO_2 over a 24-hour averaging period had a radius of 5.6 miles. A cumulative impact analysis for 24-hour SO_2 was conducted to determine compliance with the allowable PSD increment and NAAQS for 24-hour SO_2 .

The 24-hour SO_2 PSD increment and NAAQS impact analysis included sources of SO_2 within the impact area plus 31 miles (50 km). Model input data for other sources in Wyoming were provided by the Wyoming Department of Environmental Quality (WDEQ) or assembled at WDEQ’s offices. The master list of major sources of SO_2 within the radius of impact plus 31 miles (50 km) includes the following coal-fired power plants: Wygen1, Wygen2, Neil Simpson Units 1 and 2, Wyodak Unit 1, and KFx.

All of these sources were included in the Wyoming Ambient air Quality Standards (WAAQS)/NAAQS impact analysis. For PSD increment analysis, all of the listed sources were included with the exception of Neil Simpson Unit 1, which was in operation prior to the minor source baseline date for SO_2 and does not consume any PSD increment. All Wyoming sources were modeled with their respective allowable short-term SO_2 emissions for the WAAQS/NAAQS analysis and were conservatively modeled with the same allowable emission rates for the PSD increment analyses.

Predicted SO_2 NAAQS impacts also included an appropriate background level that was added to the modeled impact to arrive at total predicted impacts. For background concentrations, ambient SO_2 data collected at the Wyodak facility near Gillette was used. These measured concentrations represent conservative background levels for the Gillette area given the presence of several large sources of SO_2 at the Wyodak complex. For 24-hour background, the highest 2nd-high value of $51.8 \mu\text{g}/\text{m}^3$ measured at the site from 2003 through mid-2005 was applied.

The cumulative PSD increment analysis included emissions from the Dry Fork Station boiler and increment-consumption sources as provided by WDEQ. The highest predicted second-high 24-hour SO_2 impact of $37.8 \mu\text{g}/\text{m}^3$ was well below the allowable Class II 24-hour increment of $91 \mu\text{g}/\text{m}^3$. This modeled impact occurred about 5.6 miles southeast of the Dry Fork Station.

The highest second-high 24-hour modeled NAAQS impact was $59.1 \mu\text{g}/\text{m}^3$. The total predicted impact, including the 24-hour background level of $51.8 \mu\text{g}/\text{m}^3$, was $110.9 \mu\text{g}/\text{m}^3$. This total impact is well below the 24-hour WAAQS of $260 \mu\text{g}/\text{m}^3$ and the 24-hour NAAQS of $365 \mu\text{g}/\text{m}^3$. Table 4.5-6 presents the results of the Class II full-impact analysis for SO_2 .

Particulate Matter Smaller than 10 Microns

The PM₁₀ impact analysis is based on Dry Fork Station emissions from the Unit 1 boiler, the auxiliary cooling tower, and sources associated with material handling. Dust collectors and bin vent filters would serve as emissions controls for many of the material-handling sources. The sources associated with handling fly ash, FGD waste, and bottom ash, including the loading of haul trucks and the transfer of material into the landfill, were modeled based on 12-hour per day operations (6:00 AM to 6:00 PM).

Table 4.5-6 – Summary of Cumulative 24-hour SO₂ Model Results

Model Increment	Averaging Period/Pollutant (24-hour SO ₂)
High 2 nd -High Modeled Increment Impact	37.8 µg/m ³
Class II PSD Increment	91 µg/m ³
High 2 nd -High Modeled WAAQS/ NAAQS Impact	59.1 µg/m ³
Background Concentration	51.8 µg/m ³
Total WAAQS/ NAAQS Impact	110.9 µg/m ³
Wyoming (National) Ambient Air Quality Standard	260 (365) µg/m ³

The highest predicted 24-hour PM₁₀ impact was 4.2 µg/m³, which is below the Class II SIL of 5.0 µg/m³. This predicted impact occurred about 0.6 miles northeast of the boiler stack. The highest predicted annual impact of PM₁₀ was 0.89 µg/m³, which is below the Class II SIL of 1.0 µg/m³. This impact was predicted to occur at the facility fence line northeast of the boiler area. The analysis demonstrates that operations at the Dry Fork Station Project would produce less than significant impacts from PM₁₀.

Secondary NAAQS

Table 4.5-7 presents air model results in comparison to secondary NAAQS. Secondary NAAQS were established to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Table 4.5-7 – Predicted Secondary NAAQS Maximum Impacts from the Boiler Stack

Pollutant	Averaging Period	Maximum Predicted Project Impacts (µg/m ³)	Secondary NAAQS (g/m ³)
SO ₂	3-hour	21.1	1,300 ^(a)
NO ₂	Annual	0.3	100
PM _{2.5} ^(b)	Annual	NA	15

^(a) The NAAQS applies to sulfur oxides (SO_x). Concentrations of sulfur dioxide (SO₂) have been modeled for comparison.

^(b) PM_{2.5} is a subset of PM₁₀. Predicted concentrations of PM₁₀ have been provided for a conservative comparison to the PM_{2.5} standard.

Predicted impacts of SO₂, NO₂, and PM₁₀ are well below the secondary NAAQS. Predicted short-term concentrations of SO₂ are also well below concentrations shown to cause foliar damage to oats. Predicted impacts for all other regulated pollutants were well below the SILs.

Modeled Impacts at Devil’s Tower

Criteria pollutant and visibility impacts were modeled at Devil’s Tower National Monument, a Class II area national monument located about 40 miles northeast of the proposed Dry Fork Station. Table 4.5-8 presents the results of the criteria pollutant impacts. All modeled impacts are well below the Class II SILs.

Raw modeled visibility results at Devil’s Tower for 2001 through 2003 include a single day that exceeded a 5 percent change in visibility as compared to natural background. The maximum predicted impact was 5.3 percent. This result occurred on March 22, 2001, which is the same day that yielded 19 hours of fog, mist, or rain in the Rapid City, South Dakota, area. An examination of the National Oceanic and Atmospheric Administration surface weather maps for this day shows that a stationary weather front was directly over the Devil’s Tower area and extended into the Black Hills region of South Dakota. The presence of the weather front indicates that the modeled result at Devil’s Tower for this day was influenced by natural obscuration, and visibility impacts would be less than significant at Devil’s Tower.

Table 4.5-8 – Modeled Impacts at Devil’s Tower

Year	Annual NO ₂	3-Hour SO ₂	24-Hour SO ₂	Annual SO ₂	24-Hour PM ₁₀	Annual PM ₁₀
2001	0.02	2.0	0.6	0.04	0.06	0.004
2002	0.03	1.9	0.6	0.05	0.06	0.005
2003	0.03	2.1	0.6	0.05	0.06	0.005
Class II SIL	1	25	5	1	5	1

Air Toxics

A Tier 1 inhalation risk analysis for the Class II area around the Dry Fork Station boiler was conducted per EPA guidelines (EPA 2004). A summary of the air quality Tier 1 inhalation risk analysis is presented in Appendix D-2. Additional details of the analysis are included in the Air Permit Application (CH2M Hill 2005a).

In the risk characterizations for the proposed Dry Fork Station Power Plant, the exposure concentrations (EC) were combined with the applicable dose-response values to generate the risk and hazard estimates. Estimates of excess cumulative cancer risk, chronic non-cancer hazard, and acute non-cancer hazard were calculated separately. Background risks and risks from exposure via other exposure pathways (e.g., ingestion) were not considered in this Tier 1 risk analysis. All risk characterizations were below EPA benchmarks, and thus it was determined that no further analysis is required.

Summary of Class II Area Impact Analysis

Overall impacts to Class II areas from operation of the Dry Fork Station would be minor in magnitude, long-term, large in extent, and probable.

4.5.8 Operational Impacts on Air Quality in Class I Areas

Visibility Impacts

Class I area evaluations were performed for Wind Cave National Park, Badlands National Park, and the Northern Cheyenne Indian Reservation. The CALPUFF air model was applied to estimate the impacts on these Class I areas. A complimentary model, CALPOST, was applied to the CALPUFF results to estimate the percent change in light extinction attributable to project emissions as compared to the natural background light extinction for the Class I areas of concern. Table 4.5-9 presents a summary of the raw visibility results. This summary shows that for 16 days over the three-year period, the reduction in visibility is predicted to exceed five percent for a 24-hour period. Seven of these days were at Wind Cave National Park, two were at Badlands National Park, and seven were at the Northern Cheyenne Indian Reservation.

Table 4.5-9 – Raw Visibility Results

Area	Maximum Modeled Light Extinction (percent)	Number of Days with Percentage Change > 5 percent	Number of Days with Percentage Change > 10 percent
2001			
Wind Cave National Park	8.6	2	0
Badlands National Park	<5	0	0
Northern Cheyenne Indian Reservation	12.5	3	1
2002			
Wind Cave National Park	9.1	2	0
Badlands National Park	5.8	1	0
Northern Cheyenne Indian Reservation	5.9	3	0
2003			
Wind Cave National Park	8.3	3	0
Badlands National Park	5.2	1	0
Northern Cheyenne Indian Reservation	54.4	1	1

After the initial visibility results were determined, input data to the visibility model was adjusted for visibility impairment due to natural weather conditions. Based on these data refinements, the analytic results indicate only 2 of the 16 days where the predicted 24-hour visibility reduction (impact) would be greater than 5 percent (6.29 percent on a single day in 2001 and 5.92 percent on a single day in 2003, both at the Northern Cheyenne Indian Reservation). A detailed discussion of each instance for which the raw 24-hour visibility result exceeded 5 percent is provided in the Dry Fork Station Project Overview/ Environmental Evaluation (Basin Electric 2006a) and the Basin Electric Dry Fork Station Air Construction Permit Application (CH2M Hill 2005a). A summary of adjusted CALPUFF visibility results for the years 2001, 2002, and 2003 are shown in Table 4.5-10.

Table 4.5-10 – CALPUFF Visibility Results after Data Adjustment

Area	Maximum Modeled Light Extinction (percent)	Number of Days with Percentage Change > 5 percent	Number of Days with Percentage Change > 10 percent
2001			
Wind Cave National Park	<5	0	0
Badlands National Park	<5	0	0
Northern Cheyenne Indian Reservation	6.29	1	0
2002			
Wind Cave National Park	<5	0	0
Badlands National Park	<5	0	0
Northern Cheyenne Indian Reservation	5.92	1	0
2003			
Wind Cave National Park	<5	0	0
Badlands National Park	<5	0	0
Northern Cheyenne Indian Reservation	<5	0	0
Class I Modeling Significance Levels	<5	0	0

Criteria Pollutant Impacts

CALPOST was also applied used to estimate concentrations of NO₂, SO₂, and PM₁₀ for comparison to the Class I SILs. Modeled impacts for the Dry Fork Station for 2001 through 2003 were below all Class I SILs for all pollutants at Wind Cave National Park and Badlands National

Park. The 3-hour SIL for SO₂ of 1.0 µg/m³ was exceeded at the Northern Cheyenne Indian Reservation with 2003 meteorology (1.23 µg/m³). The 24-hour SIL of 0.2 µg/m³ was also exceeded at the Northern Cheyenne Indian Reservation, with a maximum of 0.55 µg/m³ with 2003 meteorology. All other predicted impacts at the Northern Cheyenne Indian Reservation were below the SIL. Table 4.5-11 presents a summary of the predicted criteria pollutant impacts.

Table 4.5-11 – Criteria Pollutants Impacts on Class I Areas

Class I Area	Annual NO ₂ µg/m ³	3-hour SO ₂ µg/m ³	24-Hour SO ₂ µg/m ³	Annual SO ₂ µg/m ³	24-Hour PM ₁₀ µg/m ³	Annual PM ₁₀ µg/m ³
2001						
Wind Cave National Park	0.003	0.39	0.13	0.009	0.005	0.0003
Badlands National Park	0.001	0.33	0.08	0.005	0.002	0.0001
Northern Cheyenne Indian Reservation	0.003	0.68	0.22	0.008	0.01	0.0004
2002						
Wind Cave National Park	0.004	0.45	0.17	0.011	0.006	0.0004
Badlands National Park	0.002	0.32	0.09	0.007	0.002	0.0001
Northern Cheyenne Indian Reservation	0.002	0.55	0.20	0.006	0.01	0.0003
2003						
Wind Cave National Park	0.004	0.49	0.11	0.012	0.005	0.0004
Badlands National Park	0.001	0.23	0.07	0.006	0.002	0.0001
Northern Cheyenne Indian Reservation	0.002	1.23	0.55	0.008	0.02	0.0004
Class I Significance Level	0.1	1.0	0.2	0.1	0.3	0.2

Note: Class I Significance Levels were proposed by EPA on July 23, 1996 (61 CFR 38250) but were never adopted as a final rule.

Because modeled predicted impacts were above Class I significance levels at the Northern Cheyenne Indian Reservation, a Class I cumulative PSD increment consumption analysis was completed for SO₂. The results of the cumulative SO₂ analyses at the Northern Cheyenne Indian Reservation show that the Dry Fork Station Project would not pose a significant contribution to any predicted exceedence of a Class I PSD increment. Overall, visibility impacts on Class I areas would be moderate in magnitude, long-term in duration, large in extent, with a possible likelihood of occurrence.

Deposition Impacts

EPA-approved air models were applied to estimate deposition rates for nitrogen and sulfur compounds (acid rain) in nearby Class I areas. The results are presented in Table 4.5-12. The depositional analysis threshold (DAT) for both nitrogen and sulfur is 0.005 kilograms per hectare per year (kg/ha/yr). Total nitrogen deposition did not exceed the NPS threshold at any Class I area over the three-year time interval modeled; however, the total sulfur deposition slightly exceeded the National Park Service (NPS) threshold at the Wind Cave National Park and Northern Cheyenne Indian Reservation.

The region around the proposed power plant has good acid neutralization capacity (ANC), and is therefore not sensitive to nitrogen and sulfur deposition. Therefore, the deposition impacts in Class II areas would be minor in magnitude, of long-term duration, large in extent, and unlikely to occur.

Table 4.5-12 – Modeled Atmospheric Deposition

Area	Total Nitrogen Deposition (kg/ha/yr)	Total Sulfur Deposition (kg/ha/yr)
2001		
Wind Cave National Park	0.002	0.006
Badlands National Park	0.001	0.003
Northern Cheyenne Indian Reservation	0.002	0.006
2002		
Wind Cave National Park	0.002	0.006
Badlands National Park	0.001	0.002
Northern Cheyenne Indian Reservation	0.001	0.004
2003		
Wind Cave National Park	0.002	0.008
Badlands National Park	0.001	0.003
Northern Cheyenne Indian Reservation	0.002	0.006
National Park Service Deposition Analysis Threshold	0.005	0.005

Mercury Emission Impacts

As identified in the Air Permit Application, the proposed boiler will be subject to the CAMR mercury emissions limitation of 0.000097 pound per megawatt hour (lb/MW-hr) based on a 12-month average. The anticipated mercury content in the coal is between 0.05 and 0.08 mg/kg, and the estimated potential uncontrolled mercury emission rate from the boiler would range from 0.000060 to 0.000097 lb/MW-hr. Based on these estimates, the boiler would need as much as 20 percent mercury control to meet the applicable mercury limit.

Emission control devices designed to minimize NO_x, SO₂, and PM₁₀ emissions will provide some mercury control. The proposed fabric filter and dry FGD is projected to reduce mercury emissions by 10 to 30 percent, which would satisfy the applicable mercury emission requirement under most conditions. The boiler unit would be designed with space for a mercury-specific control system. If such a system is installed, it would provide another 50 to 70 percent reduction in mercury emissions. Basin Electric has proposed the following course of action to comply with current and future mercury control requirements:

1. To establish a mercury emissions limit of 0.000097 lb/MWh in the permit based on a 12-month average.
2. To perform a Mercury Optimization Study on the Dry Fork Station. This study would begin about six months after unit start-up and would continue for one year. The study would include a review of the following potential Hg technology options:
 - a) Sorbent injection technologies
 - b) Sorbent enhancement additives
 - c) Coal pretreatment processes
 - d) Mercury oxidation technologies
3. Results from the study would be provided to the WDEQ and implemented at Dry Fork Station, as appropriate. Basin Electric and WDEQ would jointly determine whether permit modifications are necessary.

The projected increase in coal-fired power plant construction in Wyoming coupled with the limited state budget for mercury allowances may cause the mercury emission limitation for coal-fired units to become more stringent. In addition, mercury emission limits will be further reduced by CAMR in the year 2018. Therefore, a mercury-specific control system may be required to achieve compliance with the future emission limits. In conclusion, mercury deposition would be minor in magnitude, long-term in duration, large in extent, and would occur.

Greenhouse Gas Emissions

The primary greenhouse gas emission from the proposed action is CO₂. The estimated CO₂ emissions from operations are 843,744 lb/hr based on a 100 percent capacity factor. This represents about 0.05 percent of the year 2004 GHG emissions in the United States, and about 0.015 percent of the year 2004 worldwide CO₂ emissions. On a global basis, the impact of CO₂ emissions from the proposed project would be long-term in duration, large in extent, and probable.

Coal combustion also produces methane and nitrous oxide emissions. On a unit mass basis, these gases trap more heat than CO₂; however, the emission rate of methane is more than five orders of magnitude less than CO₂, and the emission rate of NO₂ is more than four orders of magnitude less than CO₂. Therefore, the contribution of these two gases to total GHG emission is negligible by comparison. By their nature, assessing potential impacts due to GHG emission from the proposed Dry Fork Station is better conducted in a cumulative context; this assessment can be found in section 5.4.3. The impacts of GHG emissions would be minor in magnitude, long-term in duration, large in extent, and probable.

4.5.9 Transmission Line

4.5.9.1 Proposed Alignment

Construction

Each construction phase has the potential to generate emissions and fugitive dust. Emissions generated are a direct result of the number and types of equipment used the amount of ground disturbance, and the duration of the activity.

Vehicle Travel on Unpaved Roads

Travel on unpaved roads would generate fugitive dust. The amount of dust generated is determined by the weight of the vehicle, the number of wheels on the vehicle, speed, and the silt and moisture content of the road surface. Heavier dust particles typically fall out of suspension close to the roadway where they are generated. However, some of the lighter particles may be transported far from the point of generation.

Material Staging Areas

Material staging areas are expected to generate minor amounts of fugitive dust.

Structure Site Clearing

The process of site clearing can release fugitive dust and vegetation particles into the air; however, most of these particles would be coarse particles that would fall out of the air within

the project site and surrounding area. The site clearing process would have a less than significant impact on air quality.

Hole Excavation

Soil disturbed through the hole-boring process tends to have higher levels of moisture than surface soils; therefore, fugitive dust from hole boring is generally minor. Fugitive dust would have less than significant impacts on air quality.

Structure Assembly, Erection, and Conductor Stringing

These activities generally involve minimal additional ground disturbance; therefore, there would be no air quality impact from these activities.

Summary

Overall, air quality impacts from the construction of the proposed transmission line would be minor in magnitude, short in duration, small in extent, and probable.

Operation

Corona activity on high voltage transmission line electrical conductors surrounded by air can produce small amounts of ozone. In rural areas, natural levels of ozone in the ambient air are generally around 10 to 100 parts per billion (ppb). The rate at which ozone is generated by the corona effect depends on many factors, such as line voltage, location, and configuration, and weather conditions. Rain and fog increase the rate of ozone generated. Typically, ground-level ozone concentrations generated around 230-kV and lower voltage transmission lines during heavy rain are significantly less than the most sensitive instruments can measure (about one ppb), and thousands of times less than ambient levels. The contribution of ozone generated by the transmission lines would have a negligible impact on air quality (PG&E 2005).

Overland vehicular travel for maintenance and inspection of the transmission line would produce tailpipe and fugitive emissions. The emission levels would have a negligible impact on regional air quality, and would occur only occasionally. Overall, the impact on air quality would be minor in magnitude, short in duration, small in extent, and unlikely.

4.5.9.2 *Alternative Alignment*

Construction/Operation

Potential impacts associated with construction and operation of the alternative transmission line alignment would be slightly greater than those for the proposed alignment because the alternative alignment is slightly longer than that of the proposed alignment. The alternative alignment would require more structure placements, more overland travel, and more travel on unpaved roads than the proposed action. However, due to the minor nature of these increases, air quality impacts from construction and operation of the alternative alignment would be effectively the same as for the proposed alignment.

4.5.10 **Summary**

A summary of the air quality impacts is presented in Table 4.5-13.

Table 4.5-13 – Summary of Impacts to Air Quality from Proposed and Alternative Sites and Transmission Line Alignments

Alternative	Air Quality Impacts
No Action	Minor in magnitude, short in duration, small in extent, and unlikely.
Proposed Action - Power Plant Construction	Minor in magnitude, medium in duration, moderate in extent, and probable.
Proposed Action - Power Plant Operations - Class II Areas	Minor in magnitude, long-term duration, large in extent, and probable.
Proposed Action - Power Plant Operations - Visibility - Class I Areas	Moderate in magnitude, long-term duration, large in extent, and possible.
Proposed Action - Power Plant Operations - Deposition - Class I Areas	Minor in magnitude, long-term duration, large in extent, and unlikely.
Proposed Action - Power Plant Operations - Mercury Deposition	Minor in magnitude, long-term duration, large in extent, and probable.
Proposed Action - Power Plant Operations - GHG	Minor in magnitude, long-term duration, large in extent, and probable.
Proposed Action - Transmission Line - Construction	Minor in magnitude, short in duration, small in extent, and probable.
Proposed Action - Transmission Line - Operations	Minor in magnitude, short in duration, small in extent, and unlikely.
Alternative Power Plant - Construction	Same as for construction of the proposed action.
Alternative Power Plant - Operations	Same as for operations for the proposed action.
Alternative Transmission Line - Construction	Same as for construction of the proposed action.
Alternative Transmission Line - Operations	Same as for operation of the proposed action.

4.6 ACOUSTIC ENVIRONMENT

A noise level evaluation was conducted for the proposed and alternative power plant sites to determine the noise impacts potentially created by construction and operation activities associated with the project. The assessment identified noise-sensitive receptors such as nearby residences; predicted facility noise levels at these residences using three-dimensional computer modeling techniques; and compared projected facility noise levels to various significance criteria (such as laws, ordinances, or regulations for the control of noise) or criteria for hearing damage, speech, and sleep interference, low-frequency noise annoyance, and structural damage (see Figure 4.6-1).

The Dry Fork Station project has both construction and operational noise issues. The Hughes Transmission Line project has limited noise-related issues. The only potentially significant noise issue is the potential corona effects associated with transmission lines. These effects were evaluated as a public health and safety issue in the Environmental Evaluation for the Hughes Transmission Line Project (Basin Electric 2006b).

4.6.1 Impact Criteria

Noise impacts fall into two categories: 1) the extent to which facility noise emissions may exceed applicable laws, ordinances, regulations, and standards; and 2) the degree to which facility noise emissions may elicit community annoyance or complaints. The significance criteria

for noise, described below in Tables 4.6-1 and 4.6-2 are used to evaluate the degree of potential impacts for this project. No BMPs were identified for noise.

4.6.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.6.3 Power Plant

4.6.3.1 Proposed Site

Construction

Based on the noise modeling conducted for the project using Sound PLAN 6.3, the worst-case construction noise levels (L_{EQ}) at the nearest receptor (House 2) are predicted to be 27 dBA. Although the current nearest noise-sensitive receptor is a single-family residence (Marshall Homestead) approximately 3,000 feet northeast of the proposed Dry Fork Station site, this property is owned by Basin Electric and would not be residentially occupied when the proposed facility becomes commercially operable. Detailed results of the noise modeling are contained in Appendix E of the Environmental Evaluation for the Dry Fork Station Project (Basin Electric 2006a).

The 27 dBA predicted by the model represents the outdoor noise level – a building or house would provide additional noise attenuation for the occupants. Specifically, noise levels within a house with the windows closed would be up to 27 dBA lower. Even with the windows open, indoor levels would be up to 17 dBA lower than ambient outdoor levels (USEPA 1974). Construction of the proposed action would have less than significant impacts on noise according to the significance criteria defined in Table 4.6-1.

In general, it is anticipated that offsite construction noise levels will be comparable to current ambient noise levels. While construction noise may occasionally be discernible, it is expected to be moderate and short-term. The average individual is likely to tolerate noise associated with construction given its temporary nature and the fact that most of the construction will take place during daytime hours. Any nighttime or weekend construction activities will likely be similar to the “finishing phase” of construction, which is typically 10 decibels quieter than for other phases. Also, the size of a nighttime workforce would be significantly smaller than a typical daytime workforce, which would also reduce noise levels.

Operation

During normal facility operations, facility noise levels at the nearest receptors are expected to be approximately 34 dBA or less. Figure 4.6-2 presents the analysis results as a series of noise level contours for the proposed site. Complete modeling calculations can be found in Appendix E of the Environmental Evaluation for the Dry Fork Station Project (Basin Electric 2006a). Operation of the proposed action would have less than significant impacts on noise according to the significance criteria defined in Section 4.6.1.

Table 4.6-1 – Issues and Significance Criteria for the Acoustic Environment – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if the project is likely to result in an effect of major magnitude for a large extent.		
	Criteria	Definition	Measurement
Noise was identified as a human health and safety issue.	Magnitude		
	Major	Violation of a noise law, ordinance, or guideline; noise levels that would cause sleep disturbance or interference with outdoor activity.	Evaluation of noise, including from each phase of activity.
	Moderate	Noise is perceptible offsite but is below the level that would cause interference with outdoor activity.	
	Minor	Noise levels are not perceptible beyond the facility fence line.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impacts lasting longer than 18 months but less than 60 months.	
	Short-term	Short period during construction or startup lasting less than 18 months.	
	Extent		
	Large	Impact is to a large area and/or numerous offsite receptors.	Results of noise modeling using SoundPlan® 6.3.
	Medium	Impact is limited to the project site and EIS study area.	
	Small	Impact is limited to immediate project site.	
	Likelihood		
	High	Impact is very likely to occur.	Results of noise modeling using SoundPlan® 6.3 and construction and operational procedures and schedule.
	Medium	Moderate potential for impact to occur.	
	Low	Little to no potential for impact to occur.	

Hearing Damage

It is generally accepted that exposure to noise levels of less than 75 dBA presents no significant risk for hearing damage. Because the highest predicted facility noise level at the nearest residence is 34 dBA, there would be no risk of hearing damage.

Sleep Interference

To avoid negative effects on sleep, indoor noise levels (L_{EQ}) should not exceed 30 to 35 dBA (Berglund and Lindvall 1995). Given an estimated facility noise level of 34 dBA at the nearest residence, and a 15-decibel noise reduction for a typical house with partially open windows, interior noise levels would be no more than 19 dBA (34 dBA–15 dBA) and therefore substantially below 30 to 35 dBA

Speech Interference

Speech spoken in relaxed conversation is intelligible when background (i.e., facility) noise levels are at or below 55 dBA (L_{EQ}). Because the highest facility noise level at the nearest residence is 34 dBA, interference with indoor or outdoor speech is not anticipated.

Table 4.6-2 – Issues and Significance Criteria for the Acoustic Environment - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if the project is likely to result in an effect of major magnitude for a large extent.		
	Criteria	Definition	Measurement
Noise was identified as a human health and safety issue.	Magnitude		
	Major	Violation of a noise law, ordinance, or guideline; noise levels that would cause sleep disturbance or interference with outdoor activity.	Evaluation of noise from each phase of activity.
	Moderate	Noise is perceptible offsite but is below the level that would cause interference with outdoor activity outside the ROW.	
	Minor	Noise levels are not perceptible beyond the ROW.	
	Duration		
	Long-term	Duration of the project (18 months).	Project construction schedule.
	Medium-term	N/A	
	Short-term	Short period during construction or startup lasting less than 18 months.	
	Extent		
	Large	Impact is to a large area and/or numerous offsite receptors.	Evaluation of the horizontal limits of expected noise threshold levels.
	Medium	Impact is limited to ROW and surrounding area.	
	Small	Impact is limited to immediate project site.	
	Likelihood		
	High	The impact will occur based on modeling results.	Evaluation of noise from each type of activity.
	Medium	Moderate potential for the impact to occur.	
Low	Little to no potential for the impact to occur.		

Low-Frequency Noise Annoyance

Low-frequency noise is sometimes characterized as “pulsating” when indoor sound pressure levels are 65 to 75 dB in the 31.5-Hertz octave band. Because the maximum outdoor noise level at the nearest residence is predicted to be approximately 52 dB in this octave band, low-frequency noise annoyance is not expected.

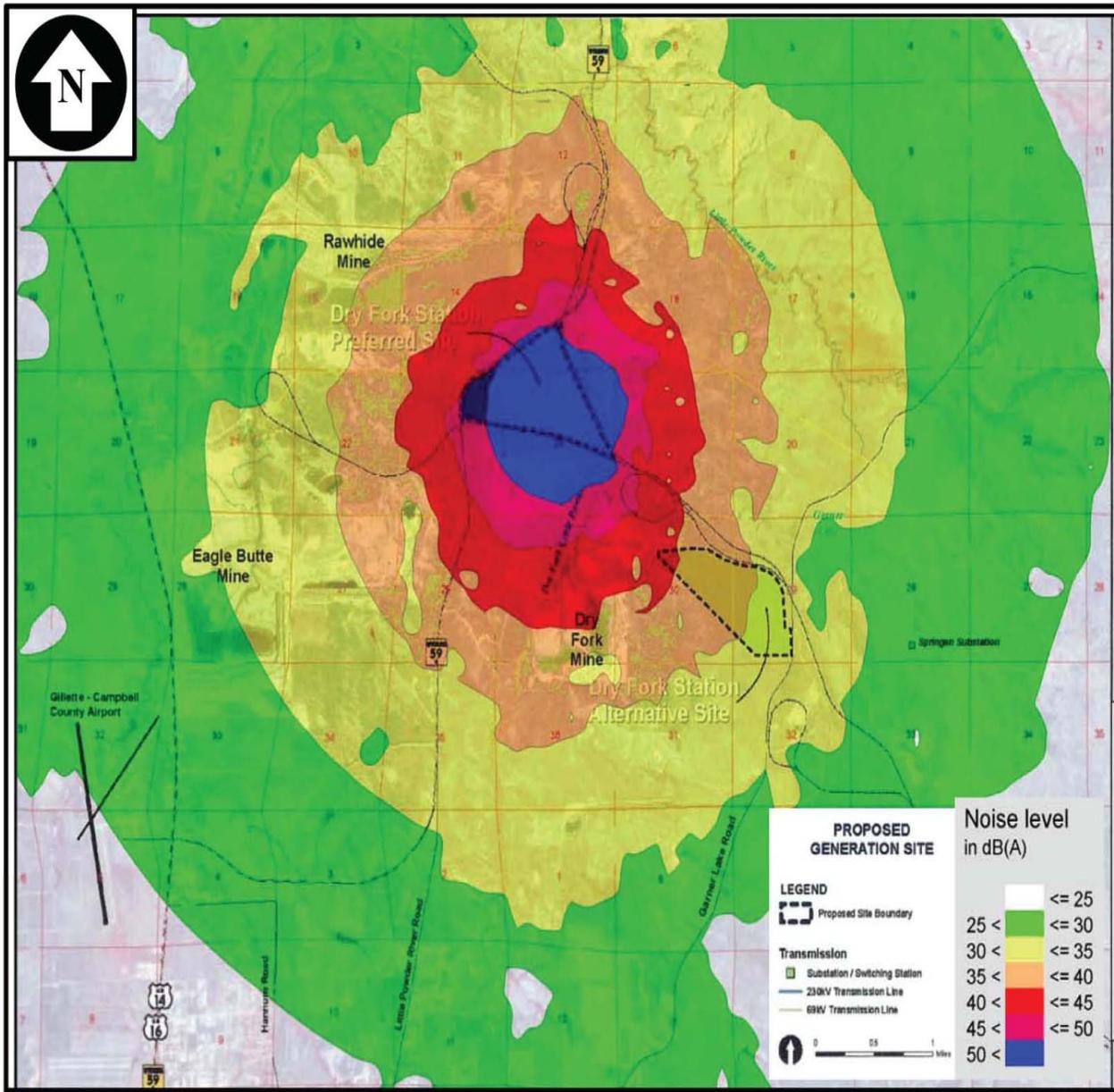


Figure 4.6-1 – Predicted Noise Contours for the Proposed Dry Fork Station

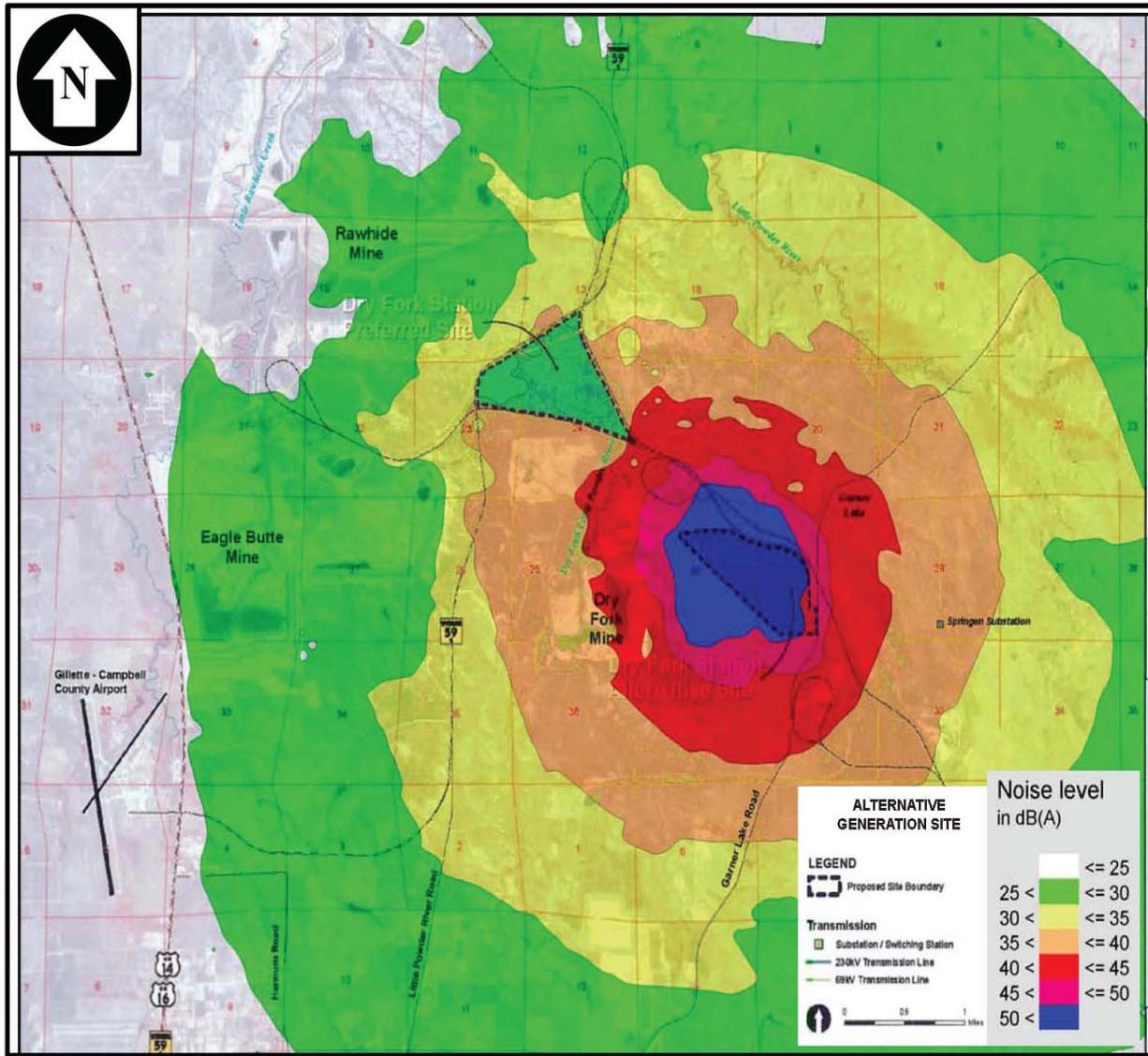


Figure 4.6-2 – Predicted Noise Contours for the Alternative Dry Fork Station

Structural Damage Due to Infrasound

Structural damage due to infrasound was evaluated in terms of air blast criteria for surface mining activities (air blasts often contain high levels of low-frequency noise). Air blast levels below 105 decibels (C-weighted [dBC]) are considered sufficiently low to eliminate any damage risk to residential structures (BOM R1 8485 1980). Acoustical modeling showed that C-weighted facility noise levels at the nearest receiver are predicted to be no higher than 55 dBC, or substantially below 105 dBC.

Infrasound is sound with a frequency too low to be detected by the human ear. Infrasound sometimes results from natural causes such as ocean waves or avalanches, or from man-made processes such as explosions.

HUD Guidelines

HUD considers sites where the day-night average noise level or L_{DN} does not exceed 65 dBA to be acceptable for housing (HUD 1991). Because the facility will operate 24 hours per day, the L_{DN} can be calculated by adding approximately 7 decibels to the predicted L_{EQ} . The highest predicted L_{EQ} noise level is 34 dBA. Therefore, the worst-case L_{DN} becomes 41 dBA (34 dBA + 7 dBA), or substantially less than the recommended HUD criteria (65 dBA) for acceptable levels of environmental noise within residential land uses.

EPA Guidelines

EPA indicates that exposure to outdoor sound levels at or below an L_{DN} of 55 dBA is satisfactory to “protect the public health and welfare with an adequate margin of safety,” because no significant speech interference, either indoors or outdoors, will result from this exposure, nor will it lead to substantial community reaction, complaints, or annoyance in average communities (EPA 1974). The facility’s L_{DN} at the nearest receiver is 41 dBA; therefore, it is significantly lower than EPA’s guidelines for acceptable levels of environmental noise within residential land uses.

Summary

Given the proposed design of the facility, the acoustical analysis concludes that:

- Facility noise levels are consistent with guidelines established by HUD and EPA for acceptable levels of environmental noise within residential land uses;
- There is no risk of hearing damage;
- Interference with sleep and indoor/outdoor speech is not expected;
- Annoyance due to low-frequency noise is not indicated; and
- No potential for structural damage due to infrasound exists.

Given these findings, noise levels generated during operation of the proposed Dry Fork Station are expected to result in less than significant impacts.

4.6.3.2 *Alternative Site*

Construction

As stated in Section 4.6.3.1, outdoor construction noise levels are predicted to be as high as 37 dBA at House 1, which is the nearest house to the alternative Dry Fork Station site. However, noise levels within a house with the windows open would be up to 17 dBA lower than ambient outdoor levels (EPA 1974). Therefore, it is anticipated that construction noise levels will be below the L_{EQ} . Construction noise would be of moderate magnitude, medium in extent, and short-term in duration with a high likelihood of occurrence. Construction of the alternative power plant action would have less than significant impacts on noise according to the significance criteria defined in Section 4.6.1.

Operation

During normal facility operations, facility noise levels at the nearest receptors are expected to be approximately 41dBA or less from the alternative site. Figure 4.6-2 presents the analysis results as a series of noise level contours for the alternative Dry Fork Station site. Complete modeling

calculations can be found in Appendix E of the Environmental Evaluation (Basin Electric 2006a).

The alternative site analysis revealed the same findings for operations as for the proposed site concerning consistency with federal guidelines for acceptable levels of environmental noise within residential land uses; lack of risk of hearing damage, interference with sleep and indoor/outdoor speech, or annoyance due to low-frequency noise; and no potential for structural damage due to infrasound.

Given these findings, noise generated during operation of the Dry Fork Station at the alternative site is expected to result in less than significant impacts according to the significance criteria defined in Section 4.6.1.

4.6.4 Transmission Line

4.6.4.1 Proposed Alignment

Construction

Construction of the Hughes Transmission Line would involve equipment such as trucks, rotary drilling rigs, and wire-pulling equipment, causing short-term noise in the immediate vicinity of the construction activities. To the extent that the construction activities would occur near occupied homes, there would be some moderate in magnitude, medium-extent, short-term noise impacts with a medium likelihood associated with these activities. These impacts, however, are only expected to occur at widely spaced intervals within the proposed transmission line alignment ROW during structure placement and wire-pulling activities.

Construction of the proposed transmission line would have less than significant impacts on noise according to the significance criteria defined in Section 4.6.1.

Operation

Noise associated with the operation of the proposed transmission line is primarily related to corona effects. Corona effects also can potentially cause radio and television interference and are produced by the electrical breakdown of the air near sharp objects or protrusions on a high-voltage energized conductor. Corona effects associated with the proposed transmission line were estimated using a Corona computer model. The design of the structures was input into the model for each segment of the transmission line. Voltage and expected power flow (average and peak) for that segment of the line were also input into the model. Table 4.6-3 lists the corona effects during rain and fair weather conditions at the ROW boundary for each transmission line segment. These corona effects would diminish with distance away from the line. For example, at a distance of 250 feet, they would diminish to levels close to ambient levels (Basin Electric 2006b).

Table 4.6-3 – Corona Effects Expected to Occur at the Right-of-Way Boundary of the Transmission Line Alignment

Transmission Line Segment	Audible Noise (dBA)		Radio Interference (dB μ V/M)		TV Interference (dB μ V/M)	
	Rain	Fair Weather Conditions	Rain	Fair Weather Conditions	Rain	Fair Weather Conditions
Dry Fork to Sheridan	42.3	17.3	52.3	35.3	16.3	0
Hughes to Dry Fork	43	18	52.9	35.9	17	0
Dry Fork to Carr Draw	43	18	52.9	35.9	17	0

dBA A-weighted decibels
dB μ V/M-decibels (voltage level) referenced to 1 microvolt per meter
Source: Basin Electric 2006b.

Audible Noise

As shown in Table 4.6-3, noise levels generated by the transmission lines would be greatest during damp or rainy weather. For the proposed transmission line alignment, low-corona design established through industry research and experience would minimize the potential for corona-related audible noise. The proposed transmission line alignment would not add substantially to existing background noise levels in the area. Research by the Electric Power Research Institute (EPRI 1982) showed that the fair weather audible noise from modern transmission lines was found to be generally indistinguishable from background noise at the edge of a 100-foot ROW. During rainy or damp weather, an increase in corona-generated audible noise would be balanced by an increase in weather-generated noise. According to the significance criteria in Table 4.6-2, impacts would be less than significant.

Radio and Television Interference

Transmission line-related radio frequency interference is one of the indirect effects of line operation produced by the physical interactions of transmission line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. The line would be constructed according to industry standards, which minimize the potential for surface irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware, and other irregularities around the conductor surface that would increase corona effects. Given the design of the transmission line and the distance of residences from the ROW, no interference-related complaints are anticipated. If interference with radio and/or television signals were to occur, Federal Communications Commission regulations would require that Basin Electric mitigate any such interference to the satisfaction of the affected individual.

Operation of the proposed transmission line would have less than significant impacts on noise according to the significance criteria defined in Table 4.6-2.

4.6.4.2 Alternative Alignment

Construction

Noise associated with construction of the alternative alignment would be similar to that described for the proposed action. To the extent that the alternative transmission line alignment is within 500 feet of 14 occupied homes, the potential for an adverse noise impact is slightly greater when compared with the proposed action. Construction of the alternative alignment

would have less than significant impacts on noise according to the significance criteria defined in Table 4.6-2.

Operation

The corona effects of the alternative transmission line would be similar to those described for the proposed action. Operation of the proposed transmission line would have less than significant impacts on noise according to the significance criteria defined in Table 4.6-2.

4.6.5 Conclusions

No significant impacts regarding noise are anticipated for either the proposed Dry Fork Station or the proposed Hughes Transmission Line alignment.

Construction-related noise from the proposed and alternative Dry Fork Station power plant would be similar. Noise impacts on the nearest occupied home would be slightly greater under the alternative action when compared with the proposed action. However, under both alternatives offsite noise levels would be comparable to ambient noise levels, and the impact is considered minor.

Operation-related noise impacts would be comparable for both the proposed and alternative power plants. Noise impacts on the nearest occupied home would be slightly greater under the alternative action when compared with the proposed action.

Construction-related noise impacts for the proposed and alternative transmission line alignments would be comparable. Residences near construction areas may experience a short-term increase in daytime noise levels. However, these levels are not expected to be significant, and construction noise would return to background levels once the construction activities in those areas is completed. To the extent that the alternative transmission line alignment is within 500 feet of 14 occupied homes, the potential for an adverse noise impact is slightly greater when compared with the proposed action, which has three occupied houses within 500 feet.

Operation-related noise (corona) impacts for the proposed and alternative transmission lines would be comparable. At a distance of 250 feet away from the transmission line, corona effects would diminish to levels close to ambient levels.

4.7 BIOLOGICAL RESOURCES

Potential impacts or effects to biological resources are assessed under sections on vegetation including the spread and establishment of noxious or invasive weed species, wetland and riparian communities, wildlife, fish and special status species including federally listed under the Endangered Species Act (ESA), eagles including in the Bald and Golden Eagle Protection Act (BGEPA), migratory birds included in the Migratory Bird Treaty Act of 1918 (MBTA) Coal Mine List, the Bureau of Land Management (BLM) sensitive species and species of special concern listed by the Wyoming Game and Fish Department (WGFD).

Resource-specific impact criteria are used to determine the significance of a particular impact on

a particular biological resource. Factors that influence the significance of effects include magnitude, duration, extent, and likelihood of the effect. Each of these factors are divided into several levels of ratings that can be applied to the individual effects such as major, moderate and minor, etc. Finally, a significance threshold was developed based on a combination of the factor ratings.

Mitigation measures and BMPs are also identified to reduce or minimize the potential environmental impacts of the proposed actions. A final determination using the significance threshold includes implementation of the mitigation measures and BMPs.

4.7.1 Analysis of Impacts on Vegetation Resources

This section analyzes the potential impacts of the proposed project on vegetation resources on the proposed and alternative power plant sites and on both transmission line alignments. Impacts on vegetation resources include the potential spread and establishment of noxious and invasive weed species. The assessment will include both direct effects such as removal of vegetation and indirect effects such as increasing the potential for spread of noxious weeds and the replacement of native plant communities. Wetland and riparian vegetation are included in Section 4.7.2.

The Wyoming Weed and Pest Control Act (W.S. 11-5-101 to 303) is enforced by the County Weed and Pest Control Districts who are responsible for ensuring the treatment, management, monitoring and future strategies and goals for controlling noxious weed populations. Noxious and invasive weeds may be dispersed over long distances by sticking on personnel and vehicles, residing in gravel and fill, and by contaminating sources of grass seed. Once established, they may outcompete and displace native vegetation. The spread of noxious weeds on a linear project like a transmission line or pipeline may be one of the greatest effects without prevention, control and education strategies (DOI 2003).

4.7.1.1 Impact Criteria for Vegetation Resources

Tables 4.7-1 and 4.7-2 present the significance criteria for impacts on vegetation resources including noxious and invasive weeds species for the proposed and alternative power plant sites and the transmission line alignments, respectively.

4.7.1.2 Potential Impacts on Vegetation Resources from the No Action Alternative

Under the No Action Alternative, the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts on vegetation, including noxious and invasive weeds, would be those described for the transmission line only.

4.7.1.3 Potential Impacts on Vegetation Resources from the Proposed Site

Vegetation

Construction and operation of the Dry Fork Station at the proposed site would permanently remove vegetation on approximately 120 acres of disturbed rangeland within the 353-acre Dry

Fork Station project area. This loss of disturbed habitat consisting of grasslands and small concentrations of sagebrush shrubland would occur within the footprint of the facility. The construction of the ash disposal facility would also permanently impact approximately 63 acres of predominantly disturbed sagebrush within the footprint of that facility. Neither area contains significant amounts of non-disturbed native plant communities. These direct effects would be moderate in magnitude, long-term in duration, small in extent, and probable in likelihood.

Table 4.7-1 – Issues and Significance Criteria for Vegetation Resources – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if it were to have a major magnitude or large extent effect on plant communities and critical habitat or if it violated any applicable regulation.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Loss of native vegetation caused by construction; Loss or degradation of rangeland and pastures Noxious weeds/invasive species moving into disturbed areas; Use of integrated pest management to control noxious weeds/invasive species Reclamation of public and private lands to reduce potential for erosion and invasion by noxious weeds and to return land to productive use; Use of native species in reclamation 	Magnitude		
	Major	The project results in the loss of undisturbed vegetation considered valuable plant or animal habitat or the introduction or expansion of invasive plant species or noxious weeds to a large extent.	Assessment of impact based on amount of habitat affected.
	Moderate	The project results in the loss of undisturbed or previously disturbed vegetation considered valuable plant or animal habitat, or the introduction or expansion of invasive plant species or noxious weeds to a medium extent.	
	Minor	The project results in the loss or degradation of disturbed vegetation considered marginal/secondary plant or animal habitat with medium to a minor extent.	
	Duration		
	Long-term	Those that would last more than a year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last one month up to one year (limited or intermittent).	
	Short-term	Those that are less than a month.	
	Extent		
	Large	Impacts vegetation outside the project site and has substantial potential to impact local and/or statewide populations.	Assessment of impact based on size of area affected.
	Medium	Impacts vegetation outside but immediately adjacent to the project site.	
	Small	Impacts are limited to the project site.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
Unlikely	The impact occurs under upset/malfunction conditions.		

Table 4.7-2 – Issues and Significance Criteria for Vegetation Resources - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it were to have a major magnitude or large extent effect on plant communities and critical habitat or if it violated any applicable regulation.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Loss of native vegetation caused by construction; • Loss or degradation of rangeland and pastures • Noxious weeds/invasive species moving into disturbed areas; • Use of integrated pest management to control noxious weeds/invasive species • Reclamation on public and private lands to reduce potential for erosion and invasion by noxious weeds and to return land to productive use; • Use of native species in reclamation 	Magnitude		
	Major	The project results in the loss of undisturbed vegetation considered valuable plant or animal habitat or the introduction or expansion of invasive plant species or noxious weeds to a large extent.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations, operation and future maintenance of the transmission line.
	Moderate	The project results in the loss of undisturbed or previously disturbed vegetation considered valuable plant or animal habitat, or the introduction or expansion of invasive plant species or noxious weeds to a medium extent.	
	Minor	The project results in the loss or degradation of disturbed vegetation considered marginal/secondary plant or animal habitat to a minor extent.	
	Duration		
	Long-term	Those that would last more than a year (or during critical periods).	Project construction schedule and location of structures.
	Medium-term	Those that would last one month, up to one year (limited or intermittent).	
	Short-term	Those that are less than a month.	
	Extent		
	Large	Impacts vegetation outside the ROW and has substantial potential to impact local and/or statewide populations.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations. Length of transmission line crossing rangeland, and locations of probable impact.
	Medium	Impacts vegetation outside the ROW.	
	Small	Impacts limited to the ROW and associated lay-down/staging areas.	
	Likelihood		
	Probable	The impact is highly likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
	Unlikely	The impact occurs under upset/malfunction conditions.	

Site clearing and construction would require large earthmoving equipment and heavy concrete handling equipment. Heavy equipment may lead to trampling of vegetation in areas adjacent to construction areas. Indirect effects to vegetation resources immediately adjacent to the sites could occur from erosion, spread of noxious and invasive weeds and alteration of surface water drainage patterns (Basin Electric 2006a). Medium extent and short-term probable impacts associated with construction include the removal or disturbance of vegetation, crushing or trampling of vegetation, and soil compaction within and immediately outside of the proposed footprint. Possible dust impacts on vegetation would be short-term and medium in extent.

During operation, routine activities would result in minor magnitude long-term (life of project), probable impacts on vegetation within the project site. Once the power plant is decommissioned, the site would be reclaimed and revegetated using native species as per BMP VG-M1. The combined direct and indirect impacts to vegetation from construction at the proposed power plant site and ash disposal facility would be moderate in magnitude, long-term in duration, small to medium extent and probable in likelihood. Overall, impacts to vegetation cover from construction, operation and eventual closure at the proposed power plant site and ash disposal facility would be less than significant.

Noxious Weeds and Invasive Species

Noxious weeds (Canada thistle) on the proposed power plant and ash landfill sites were observed to be low to moderate in density. However, the ash disposal site is heavily disturbed with invasive species (Cheatgrass and Russian thistle) and the risk for spread should be considered moderate to high. Vehicular and heavy equipment traffic can lead to increased risk for spread of noxious and invasive weeds through movement of infested soil or seeds lodged in tires or equipment. Any site clearing within the area could increase the potential for introduction of noxious or invasive weeds and the further spread of weeds already on the site.

Implementation of an integrated pest/weed management plan (Appendix F) would reduce the extent of existing noxious weeds and further minimize the potential impact of spreading new noxious weeds during the construction timeframe. Use of fill from weed-free areas and cleaning of earth-moving equipment will reduce the potential impact from noxious weeds during construction. Operation of the Dry Fork Station at the proposed site would be unlikely to contribute to the spread of noxious weeds and invasive species beyond any impact related to construction. Although site restoration and revegetation associated with mitigation measures and BMP VG-M1 would minimize the magnitude and extent of aggressive weeds within the proposed power plant and the ash disposal sites, a minor spread of these types of species would still be possible.

With strict adherence to the weed management plan during construction and operation, impacts to vegetation cover from the spread of noxious and invasive weed species due to construction-, operation-, and maintenance-related actions on the proposed power plant and ash disposal sites would be moderate in magnitude, long term, medium extent, possible, and less than significant per the criteria established in Section 4.7.1.1.

4.7.1.4 *Potential Impacts on Vegetation Resources from the Alternative Site*

Vegetation

The area of the alternative site is relatively undisturbed compared to the proposed power plant site, though it is surrounded by an existing rail line and coal mining activities. The area of the alternative site is predominantly covered by undisturbed native sagebrush shrubland steppe (see Section 3.7.1.1). Approximately 120 acres of Wyoming big sagebrush habitat contained within the immediate area of the alternative power plant footprint would be lost during construction and operation. Sagebrush is a habitat type of concern in the state of Wyoming due to the increase in oil and gas developments, particularly within the northeastern portion of the state (Basin Electric 2006a). Impacts to sagebrush and other vegetation would be reduced to the extent practical with

BMP VG-M1, but most of the vegetation loss would be unavoidable. Further discussions with WGFD on methods of sagebrush shrubland enhancement or even restoration would further minimize impacts to sagebrush habitat lost during the construction on the alternative site. Impacts would be moderate in magnitude, long-term, medium in extent, probable and less than significant.

The proposed ash disposal site would be located in the same area under both the proposed action and alternative action. Impacts of the ash disposal site and operation of the alternative power plant site would be identical to those under the proposed action and less than significant.

Noxious Weeds and Invasive Species

A small number of noxious weeds (Canada thistle and dalmatian toadflax) within the area of the alternative site are primarily associated with drainages and the alternative site access roads. Though the current densities of noxious weed areas within the alternative site were observed to be low, the disturbed area surrounding the site could have a possible likelihood of minor to moderate effects on native vegetation communities immediately adjacent to the project area from the spread of noxious weeds. These features could pose a long-term effect to the establishment of interim reclamation success by being a source for the propagation and spread of invasive species and noxious weeds. The presence of noxious and invasive species along the Dry Fork Mine access road off Garner Lake Road also poses a moderate to high risk for the spread of noxious weed species to locations outside of the project site in the Gillette area. When vehicles are driven through weed-infested areas, seed may be lodged in tire treads or in crevices of the undercarriage, or stick to vehicles with splattered mud. Seeds may become transported some distance before they become dislodged. Thus, vehicles may become potential transporters for spreading infestations of noxious and invasive weeds (DOI 2003)

Though site restoration and revegetation associated with BMP VG-M1 would minimize the magnitude and extent of invasive and noxious weeds within the alternative site, a small and minor spread of these types of species would still be possible. Invasive species and noxious weed control through spraying and an integrated pest/weed management plan could further minimize this potential impact during the construction timeframe. Regardless, impacts to vegetation resources from the spread of invasive species and noxious weeds due to construction-related actions at the alternative site would be moderate in magnitude, long term, medium extent, possible, and less than significant.

Operation of the Dry Fork Station at the alternative site would be unlikely to contribute to the spread of noxious weeds and invasive species beyond any impact related to construction. An integrated pest/weed management plan could maintain low densities of noxious weeds during operation at the alternative site.

4.7.1.5 *Potential Impacts on Vegetation Resources of the Proposed Alignment*

The proposed alignment is approximately 136 miles long and 12 miles shorter than the alternative alignment. The proposed alignment would affect fewer acres of vegetation since 69 to 81 fewer structures would be constructed. This equates to an approximately 5,175 to 6,075 square foot (0.12 to 0.14 acres) reduction in area under the proposed alignment. Seven temporary

material staging and equipment laydown areas are proposed for both alignments. Approximately 5 to 10 acres each would be required. The total area of the ROW (125-ft wide) for the proposed alignment is 2,057 acres (2,251 acres for the alternative alignment). The proposed transmission line alignment includes Segments A, C, D, E, F, H, J, L, N, P, Q, S, T, W, X, and AA (Figure 2.1-3). Segments A, F, N, P, S, X, and W are unique to the proposed alignment.

Impacts on vegetation are addressed according to project feature, substation, transmission line, material staging areas, and access roads. Impacts on vegetation were not quantified in terms of cover types because the areas of permanent impact would be limited to the base of the transmission structures. Shrubland of Wyoming big sagebrush has the greatest potential to be impacted within the ROW of the proposed transmission line.

Vegetation

The proposed transmission line segments contain varying densities of native sagebrush, grasslands, herbaceous and forested riparian, emergent wetlands, and open water, in addition to disturbed areas associated with development and agriculture. Potential impacts to wetland and riparian areas are described further in Sections 3.7.2 and 4.7.2.

Direct effects on vegetation such as the permanent removal of vegetation would primarily occur within the 75-square foot footprint of the structure; however, temporary direct impacts to vegetation adjacent to the structure would also occur be revegetated using native grass species. Consultation with resource agencies will discuss shrubland enhancement or restoration. High quality and rare habitat elements including trees and large patches of sagebrush will be avoided.

Direct, temporary impacts to vegetation would result from construction and use of material staging areas (2 at 10 acres/area). These areas will be placed adjacent to existing roads and in areas previously disturbed, where feasible. The staging areas would be revegetated but the potential for weed infestation exists. Implementation of the weed management plan should minimize the extent and likelihood of further spread of aggressive weeds.

Long-term, minor direct impacts on vegetation from construction of the alignment would occur over a small extent of land, specifically within the 125-foot construction corridor and associated staging and pulling sites. Probable disturbance at each structure site includes construction access, pole excavation and structure erection. No site grading would be anticipated, though some small areas of minor vegetation removal would be required for construction in the transmission line corridor, staging and pull sites (primarily at pole excavation sites). Additional mechanized and hand excavations would be needed for installing anchors at structures requiring guy lines. Proposed design features, mitigation measures and BMP VG-M1 would minimize the long-term impact to vegetation within the construction footprint, though the small extent of lost vegetation associated with pole excavation would result in a long-term impact at each of these sites.

During construction, possible medium-term indirect impacts to vegetation within and adjacent to the proposed transmission line alignment may occur as a result of construction-related vegetation trampling, soil compaction, and fugitive dust. The possible medium-term but minor impact of increased erosion or sedimentation (depending on the terrain) from construction and access areas would be minimized by design features, mitigation measures, and BMP VG-M1. Soils subjected

to vegetation removal in sloped areas, including hills, draws, and riparian areas, are vulnerable to sedimentation and erosion. Slopes would be stabilized during construction through the use of sediment control methods and, upon completion of construction-related disturbance, would receive prompt revegetation. Interim revegetation using annual grasses would further stabilize slopes and possibly reduce weed infestations.

Trampling of vegetation is another short-term, temporary, minor impact during construction. Construction equipment may periodically stray from the designated ROW and access roads during construction of utility poles or structures. Wire-pulling equipment will move along the alignments and also produce temporary minor impacts from trampling vegetation. Vehicles and equipment used during construction of the proposed alignment would use existing access roads. It is highly likely that vegetation adjacent to roads within the proposed alignment would be trampled during project construction. Fugitive dust and its effects are a possible direct impact of the presence of access roads and vehicle use in the area. Impacts on vegetation as a result of using access roads in the project area are possible, but would be short- to medium-term, small in extent and minor in magnitude.

Trees are a rare habitat element in the Powder River Basin (PRB) and would not be removed if possible. Trees are used by eagles and migratory birds, including raptors, as nests which are protected under the BGEPA and MBTA. Individual standing trees within the chosen ROW will be avoided whenever feasible. Constructed nest platforms may be used to mitigate the loss of this rare habitat element.

Many of the swales, draws, ravines, creeks, and rivers within the proposed transmission line alignment contain forested riparian vegetation consisting primarily of cottonwoods and box elder. Few, if any, structures would be placed in the draws and little impact is expected from construction of structures. All of the drainages, creeks, rivers, ponds, and lakes would be spanned, and areas of forested riparian vegetation would be avoided where practicable. However, riparian trees below wires that would create a safety hazard must be removed or trimmed and minor to moderate impacts are anticipated in the riparian forested habitats. Trees that are 20 ft in height or taller which upon falling would come within 10 ft of the structure or conductor are termed “danger trees” and must be removed. Topping of tall danger trees may be an alternative to their complete removal. A small patch of ponderosa pine is located in the central section of Segment J and will be impacted. Segment J is common to both the proposed and alternative alignment.

Removal of large patches of sagebrush will be avoided wherever feasible and siting the alignments close to existing roads and ROWs will minimize impacts to vegetation. As discussed in the alternative site impacts, discussions with WGFD on methods of sagebrush shrubland enhancement or even restoration would further minimize impacts to sagebrush habitat lost during the construction on the alternative site. Loss of relatively small areas of vegetation in large continuous stands of vegetation may result in fragmentation of habitat. Restoration and reclamation efforts could replace diverse shrubland communities with a few favored native grass species (DOI 2003). Impacts from construction in the proposed corridor would result in long-term, small extent, minor to moderate impacts on sagebrush shrubland within the ROW.

Portions of Segments E, J, O, N, and P may be sited within existing transmission ROWs, if feasible. Segments E and J are common to both alignments. Segment O is part of the alternative alignment and Segment P, the proposed alignment. The proposed alignment contains approximately 5 miles (31 miles for the alternative alignment) adjacent to existing transmission lines and 4 miles (10 miles for the alternative alignment) adjacent to existing roads for construction, operation, and maintenance.

The Tongue River substation (terminus) for the proposed alignment is located in a disturbed area with high densities of noxious and invasive weeds and little native vegetation. Vegetation would be permanently cleared within a 700 ft by 664 ft footprint. Construction of the Tongue River substation would have less than significant impacts on the native vegetation.

Long-term impacts to vegetation during the operation and maintenance of the proposed alignment would be associated with short-term to medium-term maintenance needs. Infrequent and minor vehicle use associated with line maintenance, possible noxious weed management, vegetation trimming and select areas of clearing or mowing, would be probable during the operation of the line in small, site-specific areas along the proposed transmission line (i.e. forested riparian, shrublands).

Overall, impacts to vegetation cover from construction and operation of the proposed alignment and its associated features would be of a minor to moderate magnitude, long term in duration, small extent, probable, and be less than significant.

Noxious Weeds and Invasive Species

The spread of weeds within the proposed alignment and along access roads as a result of land clearing and construction is likely but is expected to be limited with implementation of BMPs. Impacts from weeds are of particular concern on Segment T where the rare contracted ricegrass (*Achnatherum contractum*) already competes with three noxious weed species and three invasive weed species. Segment T is common to both the proposed and alternative alignments. Implementation of an integrated pest/weed management plan and revegetation using native species during construction of the Tongue River substation could improve the quality of the habitat, but noxious weed species may be more difficult to manage.

BMP VG-M1 would minimize impacts on native vegetation from noxious and invasive weeds within and adjacent to the proposed alignment. Invasive species and noxious weed control through spraying, pre-construction identification of weed infestations, cleaning of vehicles and equipment moving between sites and an integrated pest/weed management plan could also minimize this potential impact during the construction timeframe. It is possible that additional traffic on roads with adjacent noxious or invasive weeds could increase the spread of noxious weeds in the long term and over a large extent. However, equipment cleaning could reduce these impacts.

Operational maintenance activities within the proposed alignment could result in the possible minor spread of invasive species and noxious weeds if vehicles were not cleaned prior to entering and leaving the operational corridor and adjacent access roads. An integrated pest/weed management plan would detail how this would be done in order to control and minimize further spread of noxious and invasive species within and outside of the transmission corridor

Through design features, strict adherence to mitigation measures and BMPs, impacts to vegetation cover from the spread of invasive species and noxious weeds due to construction-, operational, and maintenance-related actions in the proposed corridor would be moderate in magnitude, long term, medium to large extent, possible, and less than significant.

4.7.1.6 Potential Impacts on Vegetation Resources from the Alternative Alignment

The alternative alignment is approximately 148 miles long and 12 miles longer than the proposed alignment. The alternative alignment would affect more acres of vegetation since 69 to 81 more structures would be constructed than the proposed alignment. This equates to an approximately 5,175 to 6,075 square foot (0.12 to 0.14 acres) increase in area under the alternative alignment. Seven temporary material staging and equipment laydown areas are proposed for both alignments. Approximately 5 to 10 acres each would be required. The total area of the ROW (125-ft wide) for the alternative alignment is 2,251 acres (194 more than the proposed alignment).

Vegetation

The alternative alignment includes Segments B, C, D, E, G, H, C, J, L, O, Q, R, T, U, Y, and AA (Figure 3.7-1). Segments B, G, O, R, U, and Y are unique to the alternative alignment. Types of construction-related, operational, and maintenance impacts on vegetation under the alternative transmission line would be similar to those described for the proposed alignment. However because the alternative alignment is 11.6 miles longer, the area of vegetation affected would be larger.

Alternative segments O and B are located in previously disturbed areas and impacts to native vegetation are less than segments with undisturbed vegetation. Segment O follows an existing transmission line ROW. Segment B is located near residences and agricultural fields with little native vegetation and some with high weed densities (however, to date only the easternmost 4 to 5 miles of this segment have been surveyed due to landowner constraints). Thus, this alignment avoids/minimizes impacts to native vegetation types.

Overall, impacts to vegetation cover from construction and operation of the alternative alignment and its associated features would be less than significant.

Noxious Weeds and Invasive Species

Though the alternative alignment is approximately 12 miles longer than the proposed alignment, the impact on vegetation resulting from the existing infestations and possible spread of noxious and invasive weed species from construction-related actions are similar to those described for the proposed alignment. Segment Y of the alternative alignment contains more noxious weed species than any other segments and the potential for spreading and difficulty of weed management is greater than other segments.

An integrated pest/weed management plan would detail measures to be taken to control and minimize further spread of noxious and invasive species within and outside of the transmission corridor. Through design features, strict adherence to the pest management plan, and BMPs, impacts to vegetation cover from the spread of invasive species and noxious weeds due to

construction, operation, and maintenance actions associated with the alternative alignment would be less than significant.

4.7.1.7 Mitigation Measures for Potential Impacts to Vegetation Resources

In addition to the BMP (Table 2.4-2), the following measures are proposed to further minimize potential impacts of the proposed action on native plant species and the spread and establishment of noxious and invasive weeds:

- Avoid removing forested riparian and intact patches of sagebrush to the greatest extent possible to minimize impacts to avian nesting and breeding sites; and
- Reseeding disturbed areas with native species. Re-planting of wetlands and riparian areas may be included in compensatory mitigation. Sagebrush enhancement and restoration should be considered.

If weed mitigation and preventative procedures are applied to all construction and reclamation practices, impacts from noxious weeds would be minimized. County weed and pest control districts should be consulted for advice on effective methods of noxious weed control. An integrated Weed Management Plan (Appendix F) can minimize impacts of the proposed action on the spread and establishment of noxious weeds. The plan will be submitted to the Campbell and Sheridan County Weed and Pest Control Councils for enforcement, as well as the district offices of the U.S. Fish and Wildlife Service (USFWS) and BLM

The specific BMP (VG-M1 from Table 2.4-2) follows:

Vegetation BMP VG-M1. To limit potential impacts to native vegetation communities and to minimize spread of noxious and invasive species, the following measures would be implemented:

- Re-seed disturbed areas using native vegetation;
- Avoid removing large patches of big sagebrush wherever feasible;
- Replant disturbed areas with native species (or non-native species as directed by the appropriate agency/landowner); and
- Implement a weed management plan prior to construction to avoid spread of noxious weeds.

4.7.1.8 Summary of Potential Impacts to Vegetation Resources

The implementation of the proposed or alternative actions with mitigation measures and BMP VG-M1 to minimize potential effects would result in minor to moderate adverse impacts over a small to medium extent. All proposed and alternative actions would have less than significant impacts on vegetation and noxious/invasive species. Both the proposed and alternative power plants would result in approximately 120 acres of loss of vegetation due to infrastructure construction. Vegetation loss would be primarily disturbed grass at the proposed site and Wyoming big sagebrush at the alternative site. The sagebrush at the alternative site is the more limited and valuable resource. However, the site is surrounded by infrastructure and disturbed

lands, so the value of this vegetation to wildlife is limited. Types of impacts would be similar between the proposed and alternative alignments. However, the area of impacts would be greater under the alternative alignment because it is approximately 12 miles longer. The extent of impacts on both alignments from the spread of noxious and invasive weeds is medium to large because the linear nature of the project has the potential to expand impacts over a large two county area.

4.7.2 Analysis of Impacts on Wetland and Riparian Resources

This section analyzes the potential impacts of the proposed project on wetland and riparian resources on two sites for the proposed power plant and on two alignments for the proposed transmission line. Impacts to both these unique and sensitive plant communities (wetlands and riparian) in the alignments are avoided by the capability of transmission lines to span across these habitats. Wetlands on the power plant sites were delineated but wetlands in the corridors were identified as riparian vegetation - cottonwoods and box elder adjacent to streams, oxbows, ponds (riparian wetlands in Section 3.7.2). Forested riparian areas are valuable as habitat for wildlife and wet meadows are susceptible to degradation from livestock grazing.

Section 404 of the Clean Water Act (CWA) requires protection of wetlands through issuance of a dredge-and-fill permit. Wetlands are regulated when adjacent to Waters of the US. Some portions of the riparian resource may also be considered wetland and protected. Forested riparian areas containing cottonwoods and box elder adjacent to streams and creeks are valuable nesting and roosting sites for raptors and migratory birds. Unavoidable impacts to wetlands and riparian areas require mitigation.

4.7.2.1 Impact Criteria for Wetland and Riparian Resources

Tables 4.7-3 and 4.7-4 present the significance criteria for impacts on wetlands and riparian areas for the proposed and alternative power plant sites and the transmission line alignments, respectively.

4.7.2.2 Potential Impacts on Wetlands and Riparian Vegetation from the No Action Alternative

Under the No Action Alternative, the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts on wetlands and riparian areas would be those described for the transmission line only.

Table 4.7-3 – Issues and Significance Criteria for Wetlands and Riparian Areas - Power Plant

Power Plant Issues Identified	Significance Threshold: An effect is considered significant if it is associated with either of the following outcomes: 1) Filling or degrading wetlands and other Waters of the US subject to the jurisdiction of the US Army Corps of Engineers (USACE), pursuant to the federal Clean Water Act (CWA), if the action were to result in the unmitigated loss of greater than 0.1 of an acre of wetland or 1 acre of a riparian plant community.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Wetlands and other Waters of the US (as defined by EPA and USACE) Riparian areas 	Magnitude		
	Major	The project was to result in the unmitigated loss of more than 0.1 acre of wetland and 1 acre of riparian community.	Assessment of impact based on amount of habitat affected.
	Moderate	The project was to result in mitigation for the unavoidable loss of greater than 0.1 acre of wetland or 1 acre of riparian area.	
	Minor	The project was to result in the loss or degradation of greater than 0.1 acre of wetland or 1 acre of a riparian area.	
	Duration		
	Long-term	Those that would last more than a year or during critical periods.	Project construction schedule.
	Medium-term	Those that would last a month, up to a year (limited or intermittent).	
	Short-term	Those that are less than a month.	
	Extent		
	Large	Impacts wetland or riparian habitat and biological resources outside the project site.	Assessment of impact based on size of area affected.
	Medium	N/A	
	Small	Impacts are limited to the project site.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
Unlikely	The impact occurs under upset/malfunction conditions.		

4.7.2.3 Potential Impacts on Wetlands and Riparian Vegetation from the Power Plant Sites

Proposed Site

The formal wetland delineation of the proposed site determined that the drainage system of the Dry Fork of the Little Powder River contains approximately 1.5 acres of emergent herbaceous wetland on the southeast corner of the proposed site. Wetland delineation work on the proposed ash landfill site identified 0.7 acres along an ephemeral drainage that had been previously mined and reclaimed associated with the Dry Fork of the Little Powder River (see Table 3.7-2).

Construction on the proposed site would avoid most wetlands and riparian resources within or adjacent to the site. BMPs, mitigation measures, and design features including a 300-foot buffer

zone, have been developed to protect wetlands from potential soil disturbances and sedimentation that could result from vegetation removal and grading during construction. The coal conveyor in the southeast corner of the site would span wetlands. There may be a culvert installed in wetlands for an access road to the conveyor. Fill of these wetlands from the culvert would be less than 0.1 acre. Impacts to wetlands and riparian resources from construction and operation of the proposed power plant and associated features in the proposed site would be minor in magnitude, short term, small extent, possible, and less than significant.

Alternative Site

A palustrine emergent wetland was identified at the alternative site. An access road divided the wetlands into 0.3 acre and 1.6 acre tracts (see Table 3.7-2).

Construction and operation on the alternative site would not affect wetlands or riparian resources within or adjacent to the site. BMPs, mitigation measures, and design features including a 300-foot buffer zone, have been developed to protect wetlands from potential soil disturbances and sedimentation that could result from vegetation removal and grading during construction. Impacts to wetlands and riparian resources from construction and operation of the power plant at the alternative site would be minor in magnitude, short term, small extent, possible, and less than significant.

4.7.2.4 *Potential Impacts on Wetlands and Riparian Vegetation from the Transmission Line*

Proposed Alignment

There are 12 potential riparian wetlands within the ROW of the proposed alignment (Segments X/W, S, N and F) with four of them located in segments common to both alignments (Segments Q, J, D, and E) as described in Section 3.7.2. Riparian wetlands were presumed at larger ephemeral and perennial waterbodies including Badger Creek, Clear Creek, Buffalo Creek, Powder River, Middle Prong, Wild Horse Creek, Wildcat Creek, Little Powder River, Wild Horse Creek, Rawhide Creek, and Hay Creek.

Because of the relatively small footprint of the pole structures, the capability to span long distances between the structures, and the relatively narrow riparian areas, coupled with implementation of BMPs and mitigation measures, no structures or construction-related disturbance would occur in wetlands or riparian areas. Plans call for all wetlands and riparian areas to be spanned. The average span of the transmission line is 800 feet and the largest wetland complex is 500 feet at Segment F of the proposed alignment. No construction in wetlands or other Waters of the U.S. are planned. Access for constructing and stringing the transmission line would be available so as not to require equipment to be driven through wetlands or fill to be placed in wetland areas. Material staging areas would be placed adjacent to existing roads and highways and placed so as to avoid wetlands and riparian areas. There are no wetlands or riparian areas within the proposed substation site.

Table 4.7-4 – Issues and Significance Criteria for Wetlands and Riparian Areas - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect is considered significant if it is associated with either of the following outcomes: 1) Filling or degrading wetlands and other Waters of the US subject to the jurisdiction of the USACE, pursuant to the CWA, if the action were to result in the unmitigated loss of greater than 0.1 of an acre of wetland or 1 acre of a riparian plant community.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Wetlands and other Waters of the US (as defined by EPA and USACE) Riparian areas 	Magnitude		
	Major	The project was to result in the unmitigated loss of more than 0.1 acre of wetland and 1 acre of riparian community..	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations, operation and future maintenance of the transmission line.
	Moderate	The project was to result in mitigation for the unavoidable loss of greater than 0.1 acre of wetland or 1 acre of riparian area.	
	Minor	The project was to result in the loss or degradation of greater than 0.1 acre of wetland or 1 acre of a riparian area.	
	Duration		
	Long-term	Those that would last greater than a year (or during critical periods).	Project construction schedule and location of structures.
	Medium-term	Those that would last a month, up to a year (limited or intermittent).	
	Short-term	Those that are less than a month.	
	Extent		
	Large	Impacts habitat and biological resources outside the project site.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations. Length of transmission line crossing rangeland and locations of probable impact.
	Medium	N/A	
	Small	Impacts are limited to the corridors	
	Likelihood		
	Probable	The impact occurs under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
Unlikely	The impact occurs under upset/malfunction conditions.		

Small areas of long-term and probable site-specific direct impacts to riparian communities would result from trimming and removing forested riparian vegetation for transmission line operation and health and safety. To minimize and/or eliminate this impact to riparian vegetation, the proposed transmission line would be routed across riparian areas where vegetation density is low to the extent practicable. Because the exact route within the ROW has not been determined, the number of trees and area of impact, and thus the magnitude of impact cannot be determined exactly. Avoidance measures and the flexibility of routing options would minimize impacts to a moderate magnitude. Indirect impacts to wetlands and riparian communities may include erosion

and sedimentation but effective use of standard erosion control methods would avoid these impacts. Additional direct and indirect impacts could be avoided by using helicopters to place the transmission line wires across or adjacent to wetlands.

A CWA Section 404 permit would be obtained from the U.S. Army Corps of Engineers (USACE) for any unforeseen, unavoidable impact on waters of the U.S., including wetlands and riparian wetlands, to authorize placement of dredged or fill material in Waters of the U.S. Any mitigation required by the permit would be completed to benefit wildlife.

Forested wetlands may be impacted by removing or trimming tall trees that pose a danger by interfering with the transmission lines or structures. Routing the corridor in areas with lower densities of trees would avoid the impact. The removal of trees in forested riparian wetlands would remove nesting sites for migratory birds and raptors. Nest structures may be proposed to replace the loss of nesting habitat. Impacts to wetlands and riparian resources from construction and operation of the proposed transmission line and associated features would be moderate in magnitude, long term in duration, small in extent, probable and less than significant.

Alternative Alignment

There are seven potential riparian wetlands within the ROW of the alternative transmission line alignment (Segments Y/U, R, and B) with four of them located in segments common (Segments Q, J, D, and E) to both alignments as described in Section 3.7.2. Riparian wetlands were presumed at larger ephemeral and perennial waterbodies. Expected impacts on wetland and riparian resources from construction and operation are similar to those described under the proposed transmission line and would be less than significant.

4.7.2.5 Mitigation Measures for Potential Impacts to Wetlands and Riparian Vegetation

Any construction near wetlands, riparian areas, or surface waters will employ standard construction BMPs:

- To avoid siting structures in wetlands and riparian areas per WT-M1;
- To span wetlands and drainages per GS-M1;
- To prevent impacts by establishing a 300-ft buffer for construction near wetlands and riparian areas per WT-M1;
- To minimize soil disturbance and tree removal per WT-M1 and GS-M1;
- To reduce erosion and sediment runoff per GS-M1 and WR-M3; and
- To stabilize disturbed areas by timely reseeding per GS-M1.

In addition to the BMPs (Table 2.4-2), the following measures are proposed to further minimize potential impacts of the proposed action on wetlands and riparian communities:

- **Pre-construction surveys** for special status species (e.g., Ute ladies'-tresses orchids, etc.) will be conducted by a qualified botanist using standard protocols during an appropriate time (See mitigation measures for Special Status Species). Drainages with suitable herbaceous wetlands that may support the Ute ladies'-tresses orchid occur along

- cutoff sections of Little Badger Creek (Segment X) and along Rawhide Creek (Segment F).
- Surveys should include delineations of wetland boundaries and an assessment of the riparian habitat for mitigation.
 - **Avoidance.** Disturbances to wetlands and the removal of forested riparian habitat will be avoided to the greatest extent possible to minimize impacts to avian nesting sites. All wetlands and drainages will be spanned and no towers will be placed in wetlands or riparian areas. Standing trees will be avoided to the extent possible.
 - **Minimization.** Unavoidable impacts to wetlands and forested riparian areas will be minimized by:
 - Wetland and stream crossings will be constructed perpendicular to minimize the areal extent of disturbance (PRB O&G ROD 2003).
 - Wetland areas will be disturbed only during dry conditions (i.e., late summer or fall), or when the ground is frozen during the winter (PRB O&G ROD 2003).
 - Removal of tall trees (danger trees) under transmission lines will result in the loss of nesting habitat in forested riparian areas. Minimizing the removal by pruning (crown reduction) or topping of tall trees under transmission lines will decrease the loss of this habitat. Maintenance pruning will require more frequent disturbances, higher risks to workers and increased costs. Lower tree heights and increased disturbances may reduce the quality of the nesting habitat but would prevent the complete loss.
 - **Nesting platforms** will be installed in suitable habitats if nesting trees need to be removed (Basin Electric 2006b).
 - **Erosion and sediment control** devices include silt fences, hay bales, temporary sediment control basins, and erosion control matting. To ensure the effectiveness of erosion and sediment control devices, monitoring of installation and adequate maintenance will be required.
 - **Noxious Weeds.** The spread and establishment of noxious and invasive vegetation (particularly Canada thistle) will be reduced in wetlands and riparian areas by implementing a Weed Management Plan.
 - **Wetland Mitigation.** Although wetland impacts are not expected, if wetlands are unavoidably impacted:
 - the jurisdictional boundaries will be delineated,
 - the wetland functions and values assessed, and
 - appropriate mitigation measures will be implemented.
 - **Riparian Mitigation.** Similarly, although riparian impacts are not expected, if riparian areas are unavoidably impacted:
 - the linear length of impact and type of riparian vegetation should be determined,
 - the potential effects on wildlife, bank stability and water quality should be assessed; and
 - appropriate mitigation measures will be implemented.
 - **Site-specific mitigation plans** should be developed and approved by the appropriate resource agencies for all proposed disturbance to wetland or riparian areas (BLM 2003).

The specific BMPs (from Table 2.4-2) for wetlands, soils, and surface water are applicable to construction in riparian areas and wetlands and are as follows:

Wetland BMP WT-M1. The following measures would be implemented to minimize impacts to wetland and riparian communities:

- Place the transmission line in areas with a low density of forested riparian species whenever feasible. This would reduce the number of trees that need to be removed within the ROW;
- Implement standard measures to minimize indirect impacts to surface waters and riparian and wetland resources, such as erosion and sedimentation controls; and
- Place transmission structures in upland communities, and buffer riparian and wetland communities by at least 300 feet whenever feasible.

Geology BMP GS-M1. Site-specific conditions of soils and geological features will dictate the types of measures best suited to reduce erosion and runoff and to stabilize disturbed areas during and after construction. Standard measures that would commonly be used to minimize soil disturbance and reduce erosion, surface runoff, and sedimentation that result from transmission line construction and existing access road improvements (no new access roads would be constructed for the transmission line) include:

- Preserve existing vegetation whenever feasible;
- Stabilize disturbed portions of the site as soon as practicable where construction activities have temporarily or permanently ceased;
- Seed disturbed sites at the appropriate times to minimize the invasion of non-native species, as recommended by agencies and landowners;
- Use barriers to prevent sediment from moving offsite and into water bodies;
- Place transmission structures to span drainages;
- Schedule maintenance operations during periods of minimum precipitation to minimize the potential of surface runoff and to reduce the risk of erosion, sedimentation, and soil compaction;
- Design substation facilities to meet regional seismic criteria; and
- Properly identify and select suitable areas to be used as staging areas.

Surface Water Resource BMP WR-M2. The following measures would avoid, minimize, and/or reduce the potential for adverse impacts to occur at the power plant site. Measures include:

- Establishment of buffer zones around wetlands to prevent impacts to those ecosystems. Both the proposed and alternative Dry Fork Station sites have enough land to allow for buffer zones to be established around the wetlands; and
- Storm water monitoring at the Dry Fork Station would be conducted periodically to comply with the legal requirements of the stormwater permit.

Inspections, secondary containment, and spill prevention measures would be implemented to prevent contact between chemical products and wastes and surface water.

Surface Water Resource BMP WR-M3. Measures to prevent, minimize, or correct, potential impacts to surface water bodies would be included in the design, construction, and maintenance of the proposed action and alternatives. More specifically, measures would include:

- Erosion and sediment controls would be established prior to construction, then maintained and controlled through the use of standard BMPs itemized in GS-M1.

Staging areas and refueling areas, if onsite fuel storage is needed for refueling, would be located away from surface water bodies to prevent accident spills and potential contamination of water resources.

4.7.2.6 *Summary of Potential Impacts to Wetlands and Riparian Vegetation*

The proposed and alternative power plant sites would not affect wetlands or riparian resources within or adjacent to the site. BMPs, mitigation measures and design features including a 300-foot buffer zone, have been developed to protect wetlands from potential soil disturbances and sedimentation that could result from vegetation removal and grading during construction or impacts associated with operations. Impacts to wetlands and riparian resources from construction and operation of the proposed power plant site and the associated features would be less than significant. No impacts to wetlands and riparian resources are expected from construction and operation of the alternative power plant site.

The proposed and alternative transmission line alignments would likely have no adverse impact on wetlands, as design features, mitigation measures, and BMPs would eliminate the need for construction in wetlands. Impacts to wetlands and riparian resources from operation of the proposed and alternative transmission lines and associated features would be less than significant. Riparian habitat, in particular trees greater than 20 feet high, within the proposed and alternative transmission line corridors would need to be removed for safety and maintenance purposes. As the exact route within the proposed and alternative transmission line corridors have not been determined, the number of trees and area of impact, and thus the magnitude of impact can not be determined. Avoidance measures and the flexibility of routing options would minimize impacts to a minor level. Construction and operation of the proposed and alternative transmission lines would have less than significant impact on riparian habitat.

4.7.3 *Analysis of Potential Impacts on Wildlife and Fisheries*

This section includes a discussion on the potential impacts on various wildlife groups from the construction and operation of the proposed power plant at two sites (proposed and alternative) and of transmission lines in two corridors (proposed and alternative). Wildlife groups include big game; raptors; birds, including neotropical migrants, waterfowl, and upland game birds; reptiles and amphibians; black-tailed prairie dogs; and other mammalian species. Impacts on wildlife resources would be reduced by implementing a number of design features, mitigation measures and BMPs. Section 4.7.4 includes a discussion of wildlife protected as special status species.

4.7.3.1 *Impact Criteria for Wildlife and Fisheries*

Tables 4.7-5 and 4.7-6 present the significance criteria for impacts on wildlife and fisheries from the power plant sites and the transmission line alignments, respectively.

4.7.3.2 *Potential Impacts on Wildlife from the No Action Alternative*

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts on wildlife would be those described for the transmission line only.

Table 4.7-5 – Issues and Significance Criteria for Wildlife and Fisheries - Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be significant if it were associated with an effect on fisheries, wildlife communities and critical habitats meeting the major magnitude or large extent criteria, or if an effect violated any applicable regulation, including the Endangered Species Act (ESA).		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Crucial ranges for breeding sage-grouse (including lek sites, nesting habitat, brood-rearing habitat) • Displacement of any wildlife and fish during construction • Disturbance that results in habitat fragmentation • Effects on migratory birds • Effects on specific wildlife species, including waterfowl, shorebirds, ground-nesting avian species, and raptors (particularly collision and electrocution), and small game • Contamination/salinity effects from wastewater treatment pond 	Magnitude		
	Major	The project would result in the loss of species or crucial habitats in the project area that would substantially contribute to a species being listed as threatened or endangered.	Assessment of impact based on amount of habitat affected.
	Moderate	The project would result in the loss of habitat types within the project area or impair the health of a population.	
	Minor	The project would result in the loss or degradation of undisturbed/developed vegetation or habitat in the affected area.	
	Duration		
	Long-term	Those that would last more than a year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last a month, up to a year (limited or intermittent).	
	Short-term	Those that are less than a month.	
	Extent		
	Large	Impacts wildlife outside the project site and has substantial potential to impact local and/or statewide populations.	Assessment of impact based on size of area affected.
	Medium	Impacts habitats and populations outside the project site.	
	Small	Impacts are limited to the project site.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
	Unlikely	The impact occurs under upset/malfunction conditions.	

4.7.3.3 Potential Impacts on Wildlife from the Power Plant Sites

Impacts on wildlife would be reduced with implementation of mitigation measures and BMPs (see Section 4.7.3.5), and design features. Mitigation measures such as buffer zones, flight diverters, perch deterrents and reclamation are detailed in Section 4.7.3.6. Relevant design features (i.e. pond sizing, including access control and monitoring, creation of alternative water sources, fencing of ash landfill site) are incorporated into the proposed and alternative power plant discussions.

The mine sites and the surrounding area, which include both power plant sites and the proposed ash disposal site, are already highly disturbed and fragmented. As a result, construction of the proposed power plant at either site would have a minor impact on wildlife from fragmentation.

Disturbance of wildlife is possible with effects limited to the project area. Possible short-term and small extent effects include increased noise impacts as a result of construction noise and visual presence from machinery and humans, and minor mortality of small ground-dwelling and burrowing reptiles, amphibians, and small mammals, from site grading.

Table 4.7-6 – Issues and Significance Criteria for Wildlife and Fisheries - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with an effect on fisheries, wildlife communities and crucial habitats meeting the major magnitude or large extent criteria or if an effect violated any applicable regulation, including the ESA.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Crucial ranges for breeding sage-grouse (including lek sites, nesting habitat, brood-rearing habitat) Displacement of any wildlife or fish species during construction Disturbance that results in habitat fragmentation Effects on migratory birds Effects on specific wildlife species, including waterfowl, shorebirds, ground-nesting avian species, and raptors (particularly collision and electrocution), and small game Potential effects on fisheries caused by degradation of water quality and sedimentation during construction 	Magnitude		
	Major	The project would result in the loss of species or crucial habitats in the project area that would substantially contribute to a species being listed as threatened or endangered.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations, operation and future maintenance of the transmission line.
	Moderate	The project would result in the degradation of any wildlife or fish species or native plant communities that serve as crucial habitat.	
	Minor	The project would result in the minimal degradation of native vegetation or habitat in the affected area.	
	Duration		
	Long-term	Those that would last more than a year (or during critical periods).	Project construction schedule and location of structures.
	Medium-term	Those that would last a month, up to a year (limited or intermittent).	
	Short-term	Those that would last less than a month.	
	Extent		
	Large	Impacts wildlife outside the ROW and has substantial potential to impact local and/or statewide populations.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations. Length of transmission line crossing rangeland and locations of probable impact.
	Medium	Impacts wildlife outside the ROW	
	Small	Impacts wildlife in the ROW and associated laydown/staging areas.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
	Unlikely	The impact occurs under upset/malfunction conditions.	

Possible long-term and small extent minor impacts include minor changes in the availability of prey and forage within the proposed power plant site and increased competition for these resources. Incorporation of wildlife BMPs (WF-M1 and WF-M2) in association with vegetation and invasive species and noxious weed containment BMP VG-M1, would minimize the extent and magnitude of these impacts.

Proposed Site

Construction of the proposed power plant would remove, over the long term, approximately 120 acres of disturbed sagebrush and grassland habitats within the 353-acre Dry Fork Station project area. This would result in a long-term loss of disturbed habitat, minor in magnitude and small in extent, which is potentially used by a variety of upland species, including pronghorn, mule deer, raptors, reptiles, amphibians, and burrowing species, such as badgers, jackrabbits, cottontails, and coyotes.

Habitat fragmentation is defined as a process that divides large expanses of habitat, resulting in a number of smaller patches (Fahrig 2003). Habitat fragmentation is commonly caused by fences, power lines, roads, and sagebrush treatments, and the presence of other habitat loss factors (Basin Electric 2006b). The proposed site and the surrounding area are already disturbed and fragmented. As a result, construction of the proposed power plant would have a minor impact on wildlife from fragmentation.

Disturbance of wildlife is possible with effects limited to the project area. Possible short-term and small extent effects include increased noise impacts as a result of construction noise and visual presence from machinery and humans, and minor mortality of small ground-dwelling and burrowing reptiles, amphibians, and small mammals, from site grading.

Possible long-term, small extent, and minor magnitude impacts include small changes in the availability of prey and forage within the proposed power plant site and increased competition for these resources. Incorporation of wildlife BMPs (WF-M1 and WF-M2) in association with vegetation and invasive species and noxious weed containment BMP VG-M1, would minimize the extent and magnitude of these impacts.

The wetland communities on the site would be left intact, but the habitats surrounding these areas would be developed, making wildlife access to wetland habitats more difficult for wildlife. Construction and operation of a rail spur and conveyor belts would increase noise over the long term within the project area, but would have minor effects on wildlife use and movement.

The proposed power plant would use dry cooling systems to minimize water use. As discussed in Section 4.4.3, impacts on surface waters within the project area would be minimal. Two stormwater ponds and one wastewater evaporation pond would be created for the project. These ponds could attract wildlife, especially waterfowl and shorebirds. The stormwater ponds are not a contamination risk. The wastewater evaporation pond could contain contaminants that could lead to a long-term increase in risk of contamination of wildlife due to biomagnification, especially those species higher in the food chain. Research is ongoing to discover the risk of acute and chronic effects on wildlife associated with exposure to elevated concentrations of water quality constituents, including salts (San Joaquin Valley 1999). There is a possible to probable likelihood of long-term, minor to moderate magnitude, small extent contamination effects on avian species, reptiles, amphibians, bats, and other terrestrial and aquatic organisms within the project area (Basin Electric 2006a). These potential impacts would be minimized, to the extent possible, by deterring wildlife use of the site with methods such as hazing if the pond attracts substantial numbers of wildlife and water quality testing indicates a threat. However, due to its small size (1 acre) and location within an industrial complex, extensive wildlife use of this pond is not expected.

Process wastewater would be used to aid in dust control at the ash landfill site. There is a possibility of long-term contamination for smaller mammals, reptiles, and avian species if found within the ash landfill site. Big game would be excluded through fencing that would be placed around the entire plant site (BMP WF-M1). With the implementation of water resources BMPs (WR-M1, M2, M3), contaminants reaching surface waters from the ash landfill and resulting in adverse impacts on wildlife would be unlikely.

Suitable nesting habitat for ground-nesting raptor species such as the ferruginous hawk, short-eared owl, and burrowing owl occurs on the proposed (and alternative) site. These are very susceptible to collision risks with transmission lines (Basin Electric, 2006b). The proposed power plant would have a 230-kV electric transmission interconnection line. The likely impact associated with this feature over the long-term would be potential avian and bat collisions with the transmission interconnection line and associated facilities. BMPs WF-M2, SS-M1, and SS-M2 contain several measures to minimize the occurrence of avian and bat collisions. These measures include increasing line visibility and installing flight diverters as determined in consultation with the wildlife resource agencies. Impacts on wildlife from the interconnection site would be minor.

Overall, impacts to wildlife from construction and operation of the proposed power plant and associated features would be long term, minor to moderate in magnitude, small in extent, possible to probable in likelihood and less than significant. When the proposed power plant is ultimately decommissioned, the site would be reclaimed and revegetated using native species. Upon completion of operations and full site restoration, as per BMP VG-M1, long-term habitat impacts (post revegetation establishment) would be less than significant.

Alternative Site

Impacts on wildlife associated with construction and operations at the alternative site are similar to those described for the proposed site, with a few exceptions. Construction on the alternative site would involve 205-acres of undisturbed, good quality native sagebrush and grassland habitats, as compared to the proposed 353-acre site of lesser quality habitat.

Other potential impacts include habitat fragmentation and loss, displacement of wildlife species from the site, mortality, disturbance associated with human presence, risks of food chain contamination, powerline collisions at the interconnection site and a very minor increase in competition for resources. The alternative power plant site would be within half a mile of a great-horned owl nest, and there is a possible short-term, medium-term, and long-term effect resulting from noise during construction, increased human presence and the associated potential for disturbance, and contamination from use of the evaporation pond. As necessary, the nest would be protected by a buffer of a quarter to a half mile wide during nesting season (BMP WF-M1).

Overall, impacts to wildlife from construction and operation at the alternative power plant site would be long term in duration, minor to moderate in magnitude, small in extent, possible to probable in likelihood, and less than significant. Once the alternative site is decommissioned, it would be reclaimed and revegetated using native species as per BMP VG-M1.

4.7.3.4 Potential Impacts on Wildlife from the Proposed Transmission Line Alignment

Big Game

It is likely that big game would be temporarily displaced from the project area during construction and maintenance as a result of increased human presence and construction noise. Displacement would in some cases be short-term, such as a flight response from human presence, or medium-term to long-term where individual or groups of animals would avoid an area with chronic human disturbance. Timing of construction and maintenance could affect the level of disturbance. More animals may be present during winter months and susceptible to disturbance. Disturbances during the pronghorn breeding season (September through October) and to kidding areas (May through July) could also increase potential impacts. No pronghorn kidding areas have been identified by WGFD in the corridors. Existing access roads would be used to construct and maintain the corridors and substation so disturbance impacts would be minimized.

The presence of more vehicles within the project area during construction creates more short-term opportunities for big game vehicle collisions, though this risk is reduced by slow vehicle speeds. Increased vehicular traffic may increase the risk of the spread of noxious weeds that could lead to a reduction in the habitat quality. Implementation of a weed management plan would minimize the risk of further weed infestations. Most long-term impacts, such as habitat degradation from lost vegetation, would be minimized with mitigation measures and BMPs for wildlife and vegetation. Increased human presence may also increase the risk of poaching. Education of workers on hunting regulations may discourage poaching.

Foraging habitat would be permanently removed within the areas where the transmission structures would be placed. This impact is small in extent and minor in magnitude because of the small area of vegetation that would be removed for each structure (approximately 75 square feet of permanent disturbance). The proposed substation site is in an area heavily impacted by noxious weeds. As a result, adverse impacts on big game habitat and forage would be minor at this location. Incorporation of BMP VG-M1 and vegetation mitigation measures (Section 4.7.1.7) would result in a probable long-term positive impact in this location as noxious weeds would be controlled and native species used for revegetation.

Overall, impacts on big game resulting from the construction of the proposed transmission line would be small in extent and minor in magnitude. Crucial habitat for big game does not exist within the proposed corridor. Impacts to big game from construction of the proposed alignment and associated features would be less than significant.

Raptors

The transmission line would be constructed using the Avian Power Line Interaction Committee Avian Protection Plan Guidelines (APLIC 2006) to minimize electrocution risk. Potential impacts from constructing in the proposed alignment include human disturbance, which could lead to nest abandonment; habitat loss and fragmentation; and raptor collisions with power lines.

There were 12 raptor nests in the ROW of segments unique to the proposed corridor (not including 3 possible or potential nests) and 2 in the ROW of segments unique to the alternative

corridor (not including 1 possible falcon). Construction and maintenance in the ROWs could result in increased disturbance to nesting raptors and fragmentation of habitat. Without mitigation, adverse impacts may result from abandonment of nests. Ground nesting birds are of particular concern for disturbance. Construction during the fall would avoid disturbance to nesting raptors but construction noise may impact remaining raptors.

Loss of trees during construction and maintenance could remove nesting habitat especially in sagebrush and grassland communities but will be avoided to the greatest extent possible. Types of impacts that could continue in the long term during operation include possible avian collisions with transmission lines and long-term habitat alteration of small areas during maintenance within the ROW (small extent). The schedule for ROW maintenance will be restricted to non-breeding periods.

Mitigation measures and BMPs WF-M1 and WF-M2 would minimize the potential for habitat loss and collision impacts. The use of flight diverters on power lines in raptor breeding, nesting, roosting, and high use areas would reduce the risk of collision. Flight diverters enable avian species to see the transmission line. Power line collision risk is minimal at the beginning of construction, and increases as construction progresses. The risk for raptor collision with transmission lines would continue through the long-term during operation. BMP WF-M2 would require that flight diverters (line markers) be placed on the power line in certain locations to enable raptors and other birds to see the transmission line. Areas of collision concern include those where nests were observed within 0.25 mile of the ROW (within 0.5 miles for bald and golden eagles), near potential cliff nesting habitats, forested riparian areas, high prey areas (prairie dog colonies and leks) and across all perennial surface waters within the proposed transmission line alignment. Ground-nesting species are very susceptible to collision risk to guy wires (Basin Electric 2006b) and their habitat is common in the alignment. Final locations of flight diverters would be determined through consultation with the USFWS and WGFD. The effectiveness of flight diverters would be monitored and additional measures proposed based on the results. With monitoring, the impact of construction and operation on raptors of the proposed corridor would be moderate in magnitude, long term in duration, medium in extent, possible, and less than significant.

The increase in human disturbance to raptors during construction, maintenance, and operation would likely be small in extent and moderate in magnitude. Many of the raptors are special status species with nests and roosts that are protected by timing restrictions and disturbance free buffers. Avoiding sections of continuous habitat, wetlands, forested riparian, and trees as stated in BMP WF-M2, would minimize raptor habitat fragmentation. Possible impacts to ground-nesting species would be further minimized with pre-construction surveys to avoid active nests as described in BMP SS-M1. Timing restrictions near active raptor nests would be implemented as agreed upon in consultations with the wildlife resource agencies.

Material staging areas would be located in areas away from raptor nesting sites and close to roads. Raptors may avoid these areas during project construction. The areas would be reclaimed once construction is complete to avoid permanent effects on raptors as a result of project operation and maintenance. As a result, effects from material staging areas are likely to be short term and small in extent.

With implementation of BMPs, mitigation measures, and timing constraints on construction, impacts to raptor species would be moderate in magnitude, long-term in duration, medium in extent, possible and less than significant.

Neotropical birds

Construction of the transmission line may result in the removal of suitable nesting, brooding and foraging areas but the permanent loss is small and restricted to the area of the power line structure. Other areas disturbed by construction will only experience temporary effects and will be revegetated. Increased predation may occur as a result of increased perching opportunities. Construction and periodic maintenance will create noise, an increased human presence and possible spread of noxious weeds. Use of a weed management plan will minimize the spread of weeds and pre-construction surveys will identify nesting sites for avoidance. With mitigation, impacts to neotropical migrants would be minor, long term, small in extent, possible and less than significant.

Waterfowl

Waterfowl habitat would not be directly affected by construction (or long-term operation) of the proposed transmission line or substation site. Waterfowl may be displaced temporarily during construction. Existing access roads would be used and the material staging areas would be placed away from surface waters. BMP WF-M2 would minimize most impacts to waterfowl in areas of high use (aquatic habitats and wetlands). The proposed substation site would be placed approximately a mile west of Prairie Dog Creek, and the proposed alignment would span a number of surface waters. With the implementation of mitigation measures and BMPs, the long-term risk of power line collision in the proposed alignment and substation connections would be possible but minor to moderate in magnitude.

Operation of the transmission line would increase perching opportunities for raptors and may result in increased predation on waterfowl. Perch deterrents are proposed for areas with high raptor prey densities including waterbodies containing waterfowl habitat. The placement and distance of perch deterrents from the prey are subject to resource agency guidelines but the effectiveness in areas of very high prey density is unknown (MSGWG 2005). Monitoring of the effectiveness of mitigation will be conducted and submitted to USFWS and WGFD.

With mitigation, the impact on waterfowl from construction and operation in the proposed alignment would be moderate in magnitude, long-term in duration, medium in extent, possible, and less than significant.

Upland Game Birds

This discussion is limited to upland game birds identified in surveys and consultation including the gray partridge, wild turkey and mourning dove - not on special status lists such as the grouse species. Impacts on non-special status upland game birds would be the short-term to medium-term removal of suitable nesting, brooding, and foraging areas. It is possible that upland game birds could also be displaced on specific sections with suitable habitat. There is an unlikely and short-term minor direct impact resulting from incidental mortality from the use of construction equipment within the project area. However, large unfragmented patches of upland shrubland and burrows will be avoided to the extent feasible and pre-construction surveys will identify areas of concern for avoidance or possible mitigation.

The presence of transmission corridor guy wires would result in a possible long-term, but minor increase of low-flying upland bird collisions within the overall project area. Flight diverters are proposed in areas of high raptor concentrations. Implementation of mitigation measures and BMP WF-M2 would require pre-construction surveys and perch deterrents in areas of heavy raptor concentration to minimize the impact of perching raptors and predation on upland birds. Flight diverters are proposed for transmission lines in riparian and grouse habitat that are also used by non-special status upland game birds. No flight diverters have been proposed for guy wires, however transmission line towers and poles will not be sited in riparian bottomlands habitat for some game birds.

The impact to non-special status upland game birds from construction of the proposed alignment and associated features would be minor in magnitude, long term, small in extent, possible and less than significant. Impacts to upland game birds of state and federal concern are addressed in Section 4.7.4.5.

Reptiles and Amphibians

The possible displacement of reptile species that inhabit site-specific portions of the proposed alignment and associated facilities is likely over the short-term in areas of active construction. Minor incidental mortality of less mobile species in small site-specific areas would be possible, resulting from the use of heavy equipment in the area.

The proposed alignment would incorporate design features and BMPs (WF-M2, WT-M1) to minimize and/or avoid aquatic and wetland habitat impacts where most amphibian species would be found. Therefore any impacts on amphibians are expected to be minor.

The impact to reptiles and amphibians from construction of the proposed alignment and associated features would be minor in magnitude, short term, small in extent, possible and less than significant.

Mammals

Black-tailed Prairie Dogs

There were ten prairie dog colonies in the ROW of the proposed corridor, eight in the alternative, and 13 in the segments common to both corridors. The largest colonies were over 80 acres in Segments W and Y.

Construction-related heavy equipment use, ROW maintenance and excavation could possibly result in short-term incidental mortality for the black-tailed prairie dog. Active prairie dog burrows would be avoided whenever feasible because they provide habitat for both prairie dogs and other species. Though avoiding all burrows may not be possible in areas with high prairie dog densities, the overall construction of the proposed transmission line and associated facilities in the proposed corridor would not displace entire colonies and impacts would be minor. Due to the abundance of prairie dogs in adjoining areas, constructing the substation would not affect overall local or statewide prairie dog populations.

Prairie dog colonies within the ROW will be surveyed prior to construction for special status species such as the ferruginous hawk, swift fox, mountain plover and burrowing owl. Prairie dog colonies in the proposed corridor (Table 3.7-6) are not large enough to serve as potential re-introduction sites for the black-footed ferret. Operation of the transmission line in the proposed corridor would increase perching opportunities for raptors and may result in increased predation on prairie dogs. Perch deterrents are proposed for areas with high raptor prey densities including prairie dog colonies. The placement and distance of perch deterrents from the prey are subject to resource agency guidelines but the effectiveness in areas of very high prey density is unknown (MSGWG 2005). Monitoring of the effectiveness of mitigation will be conducted and submitted to USFWS and WGFD.

The impact to the black-tailed prairie dog from construction and operation of the proposed alignment and associated features would be minor in magnitude, short term, small in extent, possible and less than significant.

Other Mammalian Species

This section includes other mammalian species such as bobcat, badger, coyote, jackrabbit, cottontail, and bats. Construction, maintenance and operational activities in the proposed corridor may temporarily displace the mobile species but is not expected to permanently degrade their habitat. Construction-related heavy equipment use, maintenance, and excavation could possibly result in short-term incidental mortality for small mammals but not affect overall local or statewide populations. Slow speeds on access roads and monitoring of carrion on roadways will reduce potential vehicle collision with predators.

Construction and operation in the proposed corridor could possibly have minor impacts on bats from collision risk with transmission lines. Wetlands and riparian areas used as bat foraging habitat will be spanned and flight diverters used to mark the transmission lines. The effectiveness of this mitigation for bat species is unknown however mitigation monitoring may identify impacts and serve to minimize potential impacts if they occur.

The impact to other mammalian wildlife species from construction and operation of the proposed alignment and associated features would be minor in magnitude, short term, small in extent, possible and less than significant.

4.7.3.5 *Potential Impacts on Wildlife from the Alternative Transmission Line Alignment*

Impacts on wildlife within the ROW for the alternative alignment would be similar in magnitude, likelihood, and duration to those for the proposed transmission line alignment. Extent of effects would be similar for individual occurrences, but because the alternative alignment is longer, additional habitat and likely more wildlife individuals would be affected. Other than increased length and area of the alignment, few important differences relative to wildlife impacts have been identified. Two fewer active nests were documented on the alternative alignment, so there would be less potential for nesting impacts from construction. However, the alternative alignment is 11.6 miles longer than the proposed alignment, so there is a possibility that more raptors could use the alternative alignment, thus potentially increasing risk to other species.

Overall, impacts to wildlife from construction of the alternative alignment and associated features would be less than significant.

The types of impacts that could occur from operating the alternative alignment are similar to those for the proposed alignment. Because the alternative alignment is longer, the effects would occur over a larger extent. Overall, the impact to all wildlife species from the operation of the alternative alignment and associated features would be less than significant.

4.7.3.6 *Mitigation Measures for Wildlife*

In addition to the BMPs (Table 2.4-2 and listed below), the following measures are proposed to further minimize potential impacts of the proposed action on wildlife and fish:

- **Avoidance** (rare and crucial habitat will be avoided to the extent feasible)
 - Avoid the removal of standing trees especially in sagebrush habitat;
 - Minimize impacts to burrowing animals by siting towers and poles away from burrows;
 - Avoid removing forested riparian and intact patches of sagebrush to the greatest extent possible to minimize impacts to avian nesting and breeding sites; and
 - Install nesting platforms in suitable areas if nesting trees are to be removed (Basin Electric 2006b).
- **Preconstruction surveys** for raptor nests will be conducted in suitable habitat using standardized protocols by a qualified biologist;
- **Wetland and Riparian Buffer Zones.** Minimize impacts to wetlands, forested riparian vegetation, and waterbodies to conserve these rare habitats by providing a 300 ft buffer in all wetlands. Power line towers and poles will be sited outside of these habitats;
- **Raptor/Corvid Perch Deterrents.** To protect wildlife from increased raptor and corvid predation, perch deterrents will be installed on structures, power line poles or towers in areas with abundant raptors including roosting sites and foraging areas with high concentrations of raptor prey including active or occupied leks within 0.5 mile or less. Perch deterrents will be installed across areas of concern and will exceed one span beyond these sensitive areas. These areas include forested riparian habitats, perennial waterbodies containing fish or waterfowl, wetlands, high densities of upland game birds, livestock watering ponds, steep rock cliffs and prairie dog colonies (Basin Electric 2006b). Segments with active leks within 0.5 miles of the ROW, roosting areas, perennial surface waters and prairie dog colonies have been identified in Section 3.7.
- **Bird Flight Diverters.** To minimize avian power line collisions, flight diverters will be installed on power lines in eagle foraging areas but particularly on or near perennial stream and reservoir crossings. Large perennial surface waters are rare in this region and serve as critical stopover habitats for waterfowl and other migratory birds. Flight diverters will be used where the transmission lines parallel or cross perennial waterbodies, such as the Chicken Creek Reservoir, to mitigate potential collision impacts to migratory birds;
- **Mitigation Monitoring** will be implemented to evaluate the effectiveness of mitigation measures including flight diverters and perch deterrents and to determine the need for additional measures. The evaluation will be submitted to program managers and resource agencies (USFWS and WGFD) based on agency consultation;

- **Reclamation** will include, as appropriate, re-contouring, establishing desirable, perennial vegetation, and stabilizing and controlling erosion of all disturbed areas. Additional measures, such as temporary fencing, mulching, or weed control will be used as necessary to ensure long-term vegetative stabilization of all disturbed areas. Reclamation standards will be agreed to between the operator, landowner or lessee, and appropriate state and federal agencies (DOI 2003 Appendix M).
 - Whenever feasible, construct within previously disturbed areas or developed areas with existing access roads and transmission line ROWs. Minimize construction of new access roads to avoid potential noise impacts to wildlife;
 - The areal extent of surface disturbance and the length of time that the area will remain disturbed before interim or final reclamation activities commence will be minimized;
 - Interim and final reclamation of all disturbed areas will proceed in a timely manner to avoid invasion by undesirable plant species and encourage the establishment of desirable species that will provide habitat for wildlife; and
 - Reseed disturbed areas with native grass species, at a minimum. Re-planting of wetlands and riparian areas to benefit wildlife should be included in compensatory mitigation. Discussions on sagebrush enhancement and restoration to benefit wildlife will be conducted with resource agencies.
- **Vehicle Collision Risk.** To reduce the chance of vehicle collision with wildlife, speed on all access roads during construction shall not exceed 25 mph.
 - During construction, carrion will be removed on access roads to avoid artificially feeding raptors and putting them at increased risk from collision with vehicles; and
- **Fences** to keep wildlife and livestock out of construction areas in the power plant sites will be constructed to meet BLM guidelines designed to reduce the potential for wildlife entanglement (DOI 2003).

Specific BMPs to protect wildlife and fishery resources (WF-M1 and WF-M2 from Table 2.4-2) include:

Wildlife and Fishery BMP WF-M1. The following measures would be implemented to minimize/avoid impacts to wildlife and fisheries resources:

- Conduct pre-construction surveys to locate active bird nests for species protected under the MBTA and establish buffers (if necessary) until nesting season is complete; and
- Construct plant site and all associated facilities to avoid direct and indirect impacts to wetlands and surface waters.

Wildlife and Fishery BMP WF-M2. The project would follow APLIC guidelines for avian protection. Potential measures to minimize impacts to wildlife species within the project area are:

- Perch deterrents would be installed on pole structures near active raptor nests and areas with heavy raptor concentrations in accordance with the agency consultation;
- Route the line away from individual standing trees within the chosen ROW, whenever feasible, to avoid removal of trees within the project area and the taking of nests protected under the MBTA;
- Provide a 300-foot buffer for wetlands, riparian areas, and aquatic habitats whenever feasible; and

- Install line markers (flight diverters) at all crossings of significant water bodies where waterfowl and raptors may be concentrated.

4.7.3.7 *Summary of Potential Impacts on Wildlife*

The design features, mitigation measures and BMPs would minimize the potential impacts of construction and operation of the Dry Fork Station at the proposed and alternative sites and transmission line alignments. Impacts resulting from operations at the proposed and alternative power plant sites would be less than significant. The risk of contamination and avian impacts would result in a moderate and insignificant impact. Consultations with USFWS would address additional design features and BMPs to minimize this impact if necessary.

Overall, the impact to all wildlife species would be less than significant for the proposed and alternative power plant sites. Effects by the development of the alternative power plant site would be the same as the proposed action with the exception of the loss of 120 acres of undisturbed sagebrush habitat at the alternative site. The loss of sagebrush habitat important to several species of concern would result in an insignificant impact.

Other effects on wildlife resources as a result of the proposed and alternative transmission line alignments are minor to moderate in magnitude and expected to extend to outside the ROW. Raptors and waterfowl are the primary wildlife species of concern in the project area. Implementing mitigation measures and BMPs for wildlife, vegetation, and wetlands would avoid or minimize the magnitude of most impacts. Constructing either the proposed or alternative transmission alignments would have similar types of impacts on wildlife. The most quantifiable difference is that the alternative alignment would be approximately 12 miles longer, so this line would have effects on wildlife that cover a slightly greater extent than those of the proposed alignment.

4.7.3.8 *Potential Impact on Fisheries*

This section evaluates potential impacts on fisheries from construction and operation of the proposed power plant at two sites and of the transmission line in two corridors. The area of the sites and corridors contains few perennial water bodies. The power plant sites contain several intermittent draws or drainages and the Dry Fork of the Little Powder River which is also intermittent in flow and may contain fish. The transmission line corridors cross two perennial streams: the Powder River and Clear Creek, both of which are expected to contain fish.

4.7.3.9 *Impact Criteria for Fisheries*

Tables 4.7-5 and 4.7-6 (see Section 4.7.3.1) present the significance criteria for fisheries for the proposed and alternative power plant sites, and the proposed and alternative transmission line alignments, respectively.

4.7.3.10 *Potential Impact on Fisheries from the No Action Alternative*

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts to fisheries would be those described for the transmission line only.

4.7.3.11 *Potential Impact on Fisheries from the Power Plant Sites*

Proposed Site

The proposed power plant would not be constructed on or adjoining a water body. Impacts on fish would be avoided during project construction and operation through use of BMPs WF-M2, WT-M1, WR-M3, and HM-M2, which prevent direct impacts on water bodies and minimize the potential for indirect impacts from erosion, sedimentation, and hazardous materials near water sources. Construction of the proposed power plant would not result in the alteration of natural drainage patterns or lead to a reduction in surface waters. No impacts to fisheries from construction of the Dry Fork Station and associated features at the proposed site would be expected.

Because no infrastructure would be constructed on or adjoining water bodies there would be no direct impacts on fish. BMPs WF-M2, WT-M1, WR-M3, and HM-M2 would also minimize the potential for any operational impacts. No impacts to fisheries would be expected to occur from operation of the Dry Fork Station and associated features at the proposed site.

Alternative Site

Similar to the proposed power plant site, construction and operation of the power plant at the alternative site would not result in adverse impacts on fish species.

4.7.3.12 *Potential Impacts on Fisheries from the Transmission Line*

Proposed Alignment

Construction of the proposed transmission line would not result in the alteration of natural drainage patterns or lead to a reduction in surface waters. In addition, use of BMPs WF-M2, WT-M1, WR-M3, and HM-M2 would ensure that construction would have no adverse effects on fish species. No impacts to fisheries would be expected to occur from construction of the proposed alignment and associated features.

Operation of the proposed transmission line would not result in the alteration of natural drainage patterns or lead to a reduction in surface waters. In addition, use of BMPs WF-M2, WT-M1, WR-M3, and HM-M2 would ensure that operation and maintenance of the proposed transmission line would have no adverse effects on fish species. No impacts to fisheries would be expected to occur from operation of the proposed alignment and associated features.

Alternative Alignment

Similar to the proposed transmission line, the alternative transmission line would not result in adverse impacts on fisheries or aquatic resources. No impacts to fisheries from construction and operation of the alternative alignment and associated features would be expected.

4.7.3.13 *Summary of Potential Impacts on Fisheries*

No impacts on fisheries would occur as a result of the proposed or alternative power plant sites or transmission line alignments because of avoidance of water bodies, buffer zones, and other BMPs to avoid indirect impacts.

4.7.4 Analysis of Potential Impacts on Special Status Species

Species with special status include Federal endangered and threatened species, protected eagles and migratory birds, BLM sensitive species, and WGFD species of special concern. No suitable habitat for the black-footed ferret exists on the power plant sites or transmission line corridors so construction and operation will have no effects on this species.

Informal consultation with the USFWS has been initiated in compliance with Section 7 of the ESA [16 USC 1536 (c)]. USFWS replied to a letter requesting information on listed, proposed and candidate species for Campbell and Sheridan counties. The letter, dated July 26, 2005, specified three protected species – the bald eagle, Ute ladies'-tresses orchid, and the black-footed ferret. The scope of the proposed project was submitted to the USFWS in December of 2005 and comments on the project have been received. Draft Biological Assessments (BAs) were prepared for the Dry Fork Station and Hughes Transmission Line, and were provided for initial review and comment to be USFWS in May 2007. RUS and the FWS agreed that this initial submission was to facilitate further discussion, and not for the purposes of obtaining a Service opinion. Thus any avoid/minimize measures from those documents that are included in this DEIS are subject to change pending completion of Section 7 consultation. Also, as discussed elsewhere in this section, the bald eagle has recently been de-listed, and thus will not be addressed in the final BA.

4.7.4.1 Impact Criteria for Special Status Species

Tables 4.7-7 and 4.7-8 present the significance criteria for special status species for the proposed and alternative power plant sites and the proposed and alternative transmission line alignments, respectively.

4.7.4.2 Potential Impacts on Special Status Species from the No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts to special status species would be those described for the transmission line only.

4.7.4.3 Potential Impacts on Special Status Species from the Proposed Power Plant Site

Effects on species from the construction and operation of the proposed power plant at the proposed and alternative sites are described for special status species including federally listed species, eagles protected under the BGEPA, BLM sensitive species and the State of Wyoming species of special concern. Several avian species with special status occur infrequently in the two-county area and have not been recorded in monitoring surveys of the proposed and alternative power plant sites including the northern goshawks, common loon, yellow-billed cuckoo, white-faced ibis, trumpeter swan, loggerhead shrike, and Baird's sparrow.

Bald Eagle

The bald eagle has recently been de-listed and is no longer protected under the ESA; however, its nests are protected under two other federal laws – BGEPA and MBTA. BGEPA also protects against disturbing bald or golden eagles but no regulatory definition for disturb is available. Currently, the regulatory requirement of BGEPA is so vague that very conservative mitigation

measures are proposed to avoid impacts. The new regulatory definition of disturb makes it unlawful “to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity...or (3) nest abandonment...” (72 FR 31132).

The proposed power plant site would be located more than 30 miles from the nearest known bald eagle nest site on Clear Creek, and 7 to 8 miles from the nearest known roosting site. Because of the lack of potential nesting, perching, and roosting habitat at the Dry Fork Station site and the very low abundance of waterfowl, fish, and mammalian prey species in the project area, effects from the project on the bald eagle would be limited to individual bald eagles that may forage in the upland and wetland habitats in the area. During surveys conducted in January 2005 for the mine, two bald eagles were observed within the permit boundary.

Potential effects to foraging bald eagles caused by the proposed action include: direct loss and fragmentation of foraging habitat; increased noise and human presence in the project area; contamination risks associated with the proposed wastewater and stormwater ponds; and electrocution and power line collisions at the interconnection site.

Construction of the power plant, rail spurs, and other associated facilities would fragment foraging habitat on the proposed site. Development would increase noise and human presence near the 1.5-acre wetland, decreasing prey abundance by reducing the use of the area by waterfowl and mammalian species that could be preyed upon by bald eagles. Because of the distance to bald eagle nests, roosts, and important foraging areas, bald eagle use of the proposed site would be possible but not frequent, and thus disturbance from human presence, noise, and machinery would be moderate, unlikely, and small in extent. Because the current use by potential prey species appears to be low and no large concentrations of wildlife occur at the wetland or in adjacent uplands, this effect would be minimal. The wetlands in the project area would be buffered by 300 feet in order to minimize disturbance to the wetlands and to species associated with this habitat type.

Project operation of a proposed wastewater pond, stormwater pond, and ash landfill may expose bald eagles to contaminants directly and indirectly through the food chain by eagles ingesting prey that have been exposed to elevated concentrations of contaminants in the ponds and at landfill. The effects would depend on the specific water quality conditions. Because the wastewater would be recycled for use in the dry FGD system and used for dust control, contaminants are not expected to become concentrated in the pond.

Table 4.7-7 – Issues and Significance Criteria for Special Status Species - Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with the loss of any threatened or endangered species, proposed, and/or candidate species or critical habitat, or would result in the substantial loss of habitat function or disruption of life history requirements of special status species that would prevent improvement of their status.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Effects to threatened, endangered, proposed, candidate, sensitive, and other special status species and designated critical habitats. 	Magnitude		
	Major	The project would result in the loss of any associated threatened endangered, or candidate species, or the loss of habitat that would cause a species to become listed	Assessment of impact based on amount of habitat affected. Preparation of Biological Assessments under ESA.
	Moderate	The project would result in the loss of local or statewide populations of special status specie or its habitat, which could lead to listing of a species under ESA or a take of currently listed species or disturbance of eagles.	
	Minor	The project would result in small scale loss or degradation of habitat of a sensitive but not ESA-listed species that would not contribute to impairment of the population.	
	Duration		
	Long-term	Those that would last greater than one year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last one month, up to one year (limited or intermittent).	
	Short-term	Those that are less than one month.	
	Extent		
	Large	Impacts special status species outside the project site. Has the potential to impact local and/or statewide populations.	Assessment of impact based on size of area affected.
	Medium	N/A	
	Small	Impacts are limited to the project site.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
Unlikely	The impact occurs under upset/malfunction conditions.		

The project and surrounding areas do not contain large bodies of surface waters. Avian and other wildlife species may be attracted to the newly created wastewater and stormwater ponds, the contact water pond associated with the ash landfill, and standing water that may occur at the landfill facility. The power plant structures could increase perching opportunities for bald eagles to prey on species that may be attracted to the wastewater and stormwater ponds, contact water pond, ash landfill, and the rest of the plant site. However, the proximity of the ponds and the ash landfill to the power plant will likely discourage most wildlife, including bald eagles, from using the site. Nevertheless, the ponds will be monitored for wildlife and bald eagle use, as well as water quality, as described previously. If needed to prevent wildlife from ingesting potentially contaminated water and prey from the ponds, measures would be implemented to exclude as many wildlife species from the pond as possible.

Critical habitat for bald eagles does not exist within the Dry Fork Station EIS Study Area which includes the proposed site. Even with mitigation measures and BMPs, disturbance to foraging bald eagles is possible to probable. Overall, impacts to bald eagle from construction and operation of the proposed power plant would be moderate and less than significant.

Table 4.7-8 – Issues and Significance Criteria for Special Status Species - Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with the loss of any threatened or endangered species, proposed and/or candidate species, or critical habitats, or would result in the substantial loss of habitat function or disruption of life history requirements of special status species that would prevent improvement of their status.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Effects to threatened, endangered, proposed, candidate, sensitive, and other special status species and designated critical habitats. 	Magnitude		
	Major	The project would result in the loss of any associated threatened, endangered, candidate species, or the loss of habitat that would cause a species to become listed	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations, operation and future maintenance of the transmission line. Preparation of Biological Assessments under ESA.
	Moderate	The project would result in the loss of local or statewide populations of special status specie or its habitat that could lead to listing of a species under ESA or a take of currently listed species or a disturbance of eagles.	
	Minor	The project results in small scale loss or degradation of habitat of a sensitive but not ESA-listed species that would not contribute to impairment of the population.	
	Duration		
	Long-term	Those that would last greater than one year (or during critical periods).	Project construction schedule and location of structures.
	Medium-term	Those that would last one month up to one year (limited or intermittent).	
	Short-term	Those that are less than one month.	
	Extent		
	Large	Impacts outside the ROW and associated lay-down/staging areas.	Assessment of pole placement, access roads, fencing, road crossings, and staging area locations. Length of transmission line crossing rangeland, and locations of probable impact.
	Medium	N/A	
	Small	Impacts in the ROW and associated lay-down/staging areas.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of probable impact.
	Possible	The impact occurs under worst-case operating conditions.	
	Unlikely	The impact occurs under upset/malfunction conditions.	

Golden Eagle

The golden eagle is primarily a tree nesting species but occasionally will nest on rock outcrops and structures. The proposed site contains no nesting trees or roosting sites. Ground surveys for golden eagles identified no nests but identified foraging individuals in the area. Golden eagles are most frequently observed in cottonwood riparian areas, along paved highways, in agricultural fields and near prairie dog towns. Very few are observed in rural upland rangelands like the proposed site.

A golden eagle nesting platform was constructed as mitigation for mining activities. The platform has been used by red-tailed hawks the past couple of years, so no impacts to nesting golden eagles are expected as a result of construction of the proposed power plant. However, if annual monitoring shows the nest is active and is being used by golden eagles prior to construction, buffers would be established for the nest and construction would be limited to non-breeding periods. Potential impacts to golden eagles are similar to those described above for the bald eagle. Mitigation measures include preconstruction surveys, timing constraints, nest relocation requirements, and flight diverters. With mitigation, the impacts to golden eagles from construction and operation on the proposed site would be minor, short-term, small, possible, and less than significant.

Ute Ladies'-Tresses Orchid

Potential habitat for this species occurs in herbaceous wetlands on the proposed site. Potential direct effects associated with construction of the project on the proposed (or alternative) site include loss of habitat and trampling or inadvertent take of individuals. Indirect effects may be caused by increased sedimentation and erosion during construction activities in suitable habitats, alteration of stream hydrology, and spread of noxious and invasive weeds.

The Ute ladies'-tresses orchid has the ability to persist above or below the ground surface without flowering (USFWS 2006c). Single-season surveys that meet current USFWS survey guidelines may not result in the detection of populations, and part or all of undetected populations could be lost because of surface disturbance during construction.

To minimize the potential for effects to the Ute ladies'-tresses orchid, the wetlands on the plant site would be buffered by 300 feet during construction and operation of the plant; therefore, no effects are expected to this potential habitat. If potential wetland habitats were to be directly or indirectly affected by project construction, pre-construction surveys will be conducted prior to ground disturbing activities by a qualified botanist. Mitigation measures and BMPs would be used to minimize indirect effects such as sedimentation, erosion, and contamination of wetland habitats.

Greater Sage-grouse

There was no sign of sage-grouse within the proposed power plant site during surveys. The limited extent of sagebrush provides poor habitat for this species. The site has open areas suitable for use as leks but surrounding areas are not suitable nesting and brooding habitat. Monitoring data from the mine indicates that the proposed site has never been used as a breeding area (lek) by greater sage-grouse.

Because the proposed power plant site is an area of largely disturbed lands, small extent and minor impacts to greater sage-grouse habitat would be anticipated. The proposed construction would be unlikely to result in any impacts on lek or nesting habitat. Overall, impacts to greater sage-grouse from construction and operation at the proposed power plant site would be less than significant.

Other Special Status Raptors

Special status raptor species historically found in the Dry Fork Mine permit area include the ferruginous hawk, Swainson's hawk, short-eared owls, peregrine falcon and burrowing owls. Suitable nesting habitat for ground-nesting special status species (burrowing owl, ferruginous hawk, or short-eared owl) occurs in the proposed (and alternative) site. Northern goshawks have not been observed on the proposed site.

No active raptor nests exist on the proposed power plant site, but 11 nests do exist within a one-mile buffer of the Dry Fork Mine Permit Area. Minor impacts from construction noise and movements could decrease raptor foraging on and near the proposed power plant site during construction. There would be a permanent loss of 120 acres of undeveloped land to infrastructure. This would be a minor impact in terms of primarily marginal foraging area.

Disturbance of special status raptors from human presence and machinery during operation could alter raptor behavior on and near the proposed power plant site, possibly reducing foraging opportunities. Raptors may be less likely to nest near the site in the future. Flight diverters on guy lines and transmission lines at the interconnection site will reduce collision risks to raptors. Mitigation measures and BMPs would likely be sufficient to avoid adverse impacts on existing raptor nests. Overall impacts on special status raptors would be minor to moderate.

Other Special Status Birds

No suitable sagebrush habitat occurs on the proposed site for the sage thrasher and sage sparrow, so impacts are unlikely. Although not observed in the two county study area, the long-billed curlew may possibly occur in grassland habitat of the proposed site. The loggerhead shrike, mountain plover and McCown's longspur were also not reported in the proposed site, but may possibly occur. The Brewer's sparrow and Columbian sharp-tailed grouse have been documented at the proposed power plant site and the upland sandpiper was observed north of the proposed site.

Construction of the proposed power plant would result in long-term removal of disturbed sagebrush and grassland habitats. Special status species that nest and forage in grassland and sagebrush habitats would be less likely to occur during operation due to loss of habitat and human disturbances. Because the site is relatively disturbed, it is unlikely that the site represents important habitat for any of these species.

The construction and operation of the power plant at the proposed site would have minor effects on avian species of special status within and adjacent to the site. Mitigation measures include pre-construction surveys, perch deterrents and flight diverters at the interconnection site, timing constraints, and lek buffers. Biologists accompanying construction crews will identify these species' nests and leks to minimize potential impacts and ensure compliance with the relevant

regulation. The impact to these species from construction and operation of the proposed power plant and associated features would be less than significant.

4.7.4.4 *Potential Impacts on Special Status Species from the Alternative Power Plant Site*

Bald and Golden Eagle

Expected impacts to the eagles from construction and operation at the alternative power plant site are similar to those described for the proposed power plant site.

Ute Ladies'-Tresses Orchid

Expected impacts to the Ute ladies'-tresses orchid from construction and operation at the alternative site are similar to those described for the proposed site.

Greater Sage-grouse and Columbian sharp-tailed grouse

Potential impacts on grouse are similar to those described above for the proposed power plant site, except there is better sagebrush shrubland habitat at the alternative site. The active greater sage-grouse lek found within the Dry Fork Mine permit area is approximately 0.75 mile from the alternative power plant site. Approximately 120 acres of sagebrush communities within the alternative power plant site would be permanently removed during construction.

Construction and operation on the alternative power plant site may adversely affect greater sage-grouse occurrence over the long-term within the greater Dry Fork Mine permit area and 1-mile buffer due to increased noise and predation risk. However, there have been no recorded occurrences of greater sage-grouse on the alternative site. In addition, the alternative action would not directly impact lek habitat or greater sage-grouse individuals, as they are not known to occur within the alternative site. This site is surrounded by mining disturbance and therefore does not provide suitable habitat for this species. Mitigation includes pre-construction surveys, timing constraints, lek buffers, perch deterrents and construction crew biologists. Impacts are expected to be moderate in magnitude and less than significant.

Other Special Status Raptors

Construction and operation of the power plant at the alternative site would have similar effects as those described for the proposed power plant.

Other Special Status Avian Species

Construction and operation of the power plant at the alternative site would have similar effects as those described for the proposed power plant. Because of the presence of sagebrush habitats that are less disturbed than at the proposed power plant site, effects on sagebrush dependent species could be greater. Magnitude of impact would be no greater than moderate for an individual species.

4.7.4.5 Potential Impacts on Special Status Species from the Proposed Transmission Line Alignment

Bald Eagle

Highly likely, long-term effects to bald eagles as a result of construction and operation in the proposed alignment may include temporary displacement of individuals within the alignments, loss of foraging habitat associated with construction of the proposed substation site (prairie dogs) and the transmission structures, and fragmentation of habitat. Increased noise and disturbance from human presence within the construction area is also likely over the medium-term. Potential long-term adverse effects to the bald eagle from operation of the transmission line include: the moderate likelihood of disturbance to communal roosting sites along Segment P (proposed alignment); increased risk of collision; and potential loss of, or disturbance to, winter roosting and potential nesting habitats in areas where the line would span surface waters and riparian communities. Likely long-term impacts on bald eagles may include increased risk of collision near communal roosting sites. The line should be located away from the communal roosting site located along Segment P to avoid direct impacts on this habitat. Whenever the line would cross surface water habitats which contain tree species, the area with the lowest density of trees should be chosen as the crossing point to avoid taking potential nesting and roosting habitat for the bald eagles. Trees which contain potential nesting habitat, or those suitable as communal roosting habitat, would not be removed during construction. All potential effects would be limited to the project area.

Nest sites located approximately 1.25 miles south of Segment T (common to both alignments) and approximately 1 from Segment X (proposed alignment) would not be directly impacted by the proposed transmission line alignment. But, it is recommended that flight diverters be placed along Clear Creek and Prairie Dog Creek to mitigate potential collision risks and possible injury to foraging bald eagles.

All other nests are also at a safe distance (approximately 2 miles) from the proposed ROW to avoid direct impacts on nests and nesting habitats. Therefore no direct effects to nesting sites are expected. Placing flight diverters across all major surface waters would also mitigate impacts on foraging eagles within the project area.

Without proper mitigation, collision risk within the project area is likely to cause long-term, moderate to major impacts on bald eagles within areas that would not follow existing transmission line corridors. Implementation of flight diverters in the mitigation measures and BMP WF-M2 would lower the potential level of impact. The bald eagle communal roosting site located along Segment P should be avoided and flight diverters placed in appropriate locations as specified through consultation with the USFWS in order to avoid adverse impacts on bald eagles and their habitat. With proper mitigation the project would have minor effects. Thus, there would be no significant impact on bald eagles as a result of the proposed action.

Ute Ladies'-Tresses Orchid

Based on field investigations in June 2006, Segments X (proposed), J (common) and F (proposed alignment), may contain potential habitat for this species. It is assumed for this evaluation that wetlands, floodplains, wet meadows, drainages, perennial and ephemeral drainages, creeks,

ivers, and streams would be spanned and buffered during project construction. Overhead construction is recommended in areas that would span the wetlands, floodplains, and drainages in order to avoid direct and indirect impacts on potential Ute ladies'-tresses orchids and their habitats. Based on the size of the potential habitats for the orchid within the project area, areas of concern would likely be avoided. The average span length is 800 feet, and could extend up to 1,200 feet if necessary. Assuming these areas would be spanned and structures would be placed in upland habitats, construction and operation of the proposed transmission line would result in no impacts on Ute ladies'-tresses orchid or potential habitat. In addition, this species is not known to occur within the transmission line study area. If it is decided that the proposed alignment cannot span potential wetland habitats or transmission line structures must be placed in one of these areas, surveys would be required by the USFWS prior to construction in order to avoid inadvertent take of a federally threatened species. A qualified biologist should be present at the time the transmission line is constructed in potential habitat areas to ensure direct and indirect impacts on suitable habitat are avoided. With proper mitigation, the construction and operation of the proposed alignment would have no impact on the Ute ladies'-tresses orchid.

Greater Sage-grouse

Construction activities in the proposed alignment would result in several medium-term effects, including an increase in human presence in the ROW, noise disturbance, displacement of individuals, and removal of sagebrush habitats within construction areas. Highly likely long-term effects would include removal and fragmentation of sagebrush and lek habitats.

Studies have shown the amount and frequency of noise associated with development has negative effects on the greater sage-grouse. The sage-grouse populations have been measured to be lower on leks within one mile of CBM compressor stations in Campbell County, Wyoming, than on leks farther from these developments (Basin Electric 2006b). In addition, lek activity is reduced downwind of drilling activities, suggesting that noise has measurable negative impacts on sage-grouse (Basin Electric 2006b). Road noise may also lead to adverse effects to the greater sage-grouse. One study showed there were no active sage-grouse leks within 1.24 miles of Interstate 80 (I-80) across southern Wyoming, and only 9 leks were known to occur between 1.24 miles and 2.49 miles of I-80 (Basin Electric 2006b). Finally, the rate of sage-grouse nest initiation is influenced by construction activities further than 1.86 miles away (Basin Electric 2006b).

The construction and operation in the proposed alignment is highly likely to result in habitat fragmentation, long-term displacement of grouse, and potential abandonment of lek sites. These would be long-term effects that would be moderate to major in magnitude and large extent. With implementation of mitigation measures and BMPs, overall impacts to greater sage-grouse may be reduced to less than significant.

Studies have shown that sage-grouse are negatively impacted by power lines through accidental contact while in flight and through predation by raptors that use power line poles as perches (Basin Electric 2006b). Increased perching opportunities for raptors and ravens (corvids) lead to increased predation rates on breeding sage-grouse. Sage-grouse are particularly vulnerable when strutting for female grouse on leks. Sage-grouse will often nest and brood within 1 to 4 miles of the lek site. Braun (Basin Electric 2006b) concluded that elimination of raptor perch sites on power lines markedly reduces the impact of transmission line presence in an area.

The distance from transmission lines where sage-grouse populations are affected may vary significantly but range from 0.4 to 2 miles. Although the magnitude of such effects on sage-grouse habitats and populations is unknown, sage-grouse use has been shown to increase as distance from power lines increases (Braun 1998). The report, *Guidelines to Manage Sage-Grouse Populations and their Habitats*, includes the following recommendation “avoid building power lines and other tall structures that provide perch sites for raptors within 3 km (approximately 2 miles) of seasonal habitats. If these structures must be built or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites” (Connelly et. al. 2000). A similar recommendation, without a specific distance identified, is presented in the BLM’s National Sage-Grouse Habitat Conservation Strategy (BLM 2004). The Record of Decision and Resource Management Plan for the PRB Oil and Gas Project (BLM 2003) requires perch deterrents and flight diverters on power poles and distribution lines within 0.5 miles of any sage-grouse breeding ground.

Sage-grouse use of areas near power lines, as measured by pellet transects, increases as distance from the power line increases for up to 600 meters or 0.4 miles (Basin Electric 2006b). Power lines fragment habitats for sage-grouse and reduce their security in linear strips greater than 1 km in width. However, transmission line development may not always lead to abandonment of lek sites. WGFD data show that greater sage-grouse leks have been recorded within existing transmission line ROWs within the Hughes Transmission Line study area south of Segment H and along Segment O. The primary direct impact to the greater sage-grouse associated with construction and operation of an electric transmission line within the area over the long-term is the potential for further fragmentation of sagebrush habitats and historic lek sites within the project area.

In order to mitigate impacts on greater sage-grouse, transmission structures should be placed a minimum of 0.25 miles away from active lek sites (Basin Electric 2006b). If it is not feasible to move the line this distance, it is preferred that construction is limited to winter months to avoid the breeding season, which begins in March and lasts through mid-July. The standard distance between transmission line structures will be 800 feet, therefore, it is not possible to place structures greater than 0.25 miles, (1,320 ft) from leks located within the ROW. Additional mitigation is proposed to place perch deterrents on transmission structures that are located with a 0.5 mile buffer of active and occupied lek sites. Precedence for the 0.5 mile distance has been set by the PRB Oil and Gases (O&G) Project (BLM 2003).

Signs of sage-grouse concentration and breeding areas were found within Segments AA, X, W, S, T, S, Q, P, N, J, A and F. Without proper mitigation (such as perch deterrents), operation of the line within suitable habitats in these segment ROWs is highly likely to result in indirect mortality, through increased raptor and corvid (crow family) predation, of local sage-grouse populations within the area over the long-term.

Construction and operation of a transmission line near occupied leks that were not active in April 2006 would not result in direct impacts on greater sage-grouse. However, operation of the transmission line over or adjacent to these leks may result in permanent avoidance of the areas in the future. Consultation with resource agencies may identify additional mitigation measures that would minimize this potential loss of habitat.

With mitigation (Section 4.7.4.7) and further consultation with resource agencies, impacts of construction and operation of the transmission line would be moderate to major in magnitude, long term, large in extent, probable, and less than significant.

Other Special Status Raptors

The ferruginous hawk and burrowing owl were recorded nesting within the proposed ROW. As a result, the primary likely long-term impacts associated with construction of the proposed Hughes Transmission Line are nest abandonment and/or destruction, collision risk with the transmission line, loss of foraging and nesting habitats, and habitat fragmentation. In addition, increased noise and human presence are highly likely to impact the species over the medium-term. Surveys are required prior to construction in order to avoid impacts on species protected under the MBTA if construction is to occur during the avian breeding season. The project is planned to be constructed outside of the breeding season, so these impacts are not expected. Flight diverters should be placed in areas where active sensitive raptor nests are found.

Given the lack of habitat, it is unlikely that northern goshawks nest in the project area; however, they may be found foraging throughout the area. Therefore, the primary likely long-term impact to goshawks traveling through the area is collision with the transmission line, particularly in areas where the line would cross forested communities.

Suitable habitat exists for the peregrine falcon north of proposed Segment F. As a result, cliff habitats should be avoided whenever feasible during project construction. The primary highly likely impacts on falcons would be permanent fragmentation of foraging habitats, increased risk of collision and electrocution along the transmission line over the long-term, and increased noise and human disturbance in the area over the medium-term.

With mitigation (Section 4.7.4.7), impacts on sensitive raptor species would be reduced to minor in magnitude.

Other Special Status Avian Species

Construction and operation of the proposed alignment would possibly result in short-term to medium-term removal of suitable nesting, brooding, and foraging areas for many neotropicals and short-distance migrants. Available habitat would be temporarily disturbed during construction but would be revegetated (as per VG-M1 and WF-M1). Though an increase in medium-term human presence, noise, and disturbance would occur, migratory and resident avian species are unlikely to be displaced past the short-term and immediate area of construction. If construction should occur during the avian breeding season, preconstruction surveys (WF-M1) would be implemented to minimize impacts on breeding individuals and their nesting sites. Increased perching opportunities for raptors could increase predation rates on neotropical migrants. This effect would be probable, long-term, small extent, but moderate in magnitude.

The proposed alignment would have probable but minor effects on neotropical and short-distance migrants within and adjacent to the proposed transmission line and associated features. The impact to neotropicals and short-distance migrants from construction and operation of the proposed transmission line and associated features would be less than significant.

Columbian Sharp-Tailed Grouse

Though there are no documented Columbian sharp-tailed grouse leks or occurrences of this species within the proposed transmission line ROW, potential habitat exists within portions of the corridor (Segment X-W) and the species was documented within the alternative transmission line corridors. Similar to the discussion for greater sage-grouse, construction and operation of the proposed transmission line could fragment habitat for this species and reduce the future establishment of new grouse leks within the area. Mitigation measures include pre-construction surveys, seasonal lek buffer zones for construction or maintenance, monitoring of mitigation effectiveness, and perch deterrents (see Section 4.7.4.7).

Based on the rarity of occurrence of this species, with implementation of mitigation measures and BMPs including incorporation of the recommended lek buffers and seasonal restrictions, any impact to Columbian sharp-tailed grouse would be minor and less than significant.

White-faced Ibis

The white-faced ibis was not observed within the proposed ROW although potential habitat exists for this species. Wetland habitats would be spanned by the transmission line. As a result, highly likely, medium-term impacts on this species may include increased human noise and disturbance in the project area and temporary displacement during project construction. A highly likely, long-term effect of project operation is collision risk with the proposed Hughes Transmission Line where the line passes over large aquatic habitats/wetlands. The substation sites would not be located within suitable habitat for this species and would therefore not impact the white-faced ibis.

Bats

Suitable habitat for these species does exist and the primary long-term impact on sensitive bat species within the proposed transmission line area would be the potential of collision risk with the transmission line during construction and operation. Bats may also be temporarily displaced or forced to avoid foraging habitats, such as riparian and wetland communities in the medium-term during project construction. Increased human presence and noise are likely to adversely affect bat species over the medium-term in the project area. Incorporation of mitigation measures and BMP WF-M2 would minimize the possible minor disturbance and collision-related impacts to bat species within small and site-specific areas. Impacts to bat species would be less than significant.

Swift Fox

Although not detected during surveys, the swift fox may be present in the project area and could be displaced from the project area over the medium-term during construction. Preconstruction surveys will be conducted in prairie dog colonies to avoid impact to this species. During construction of poles and structures, burrows will be avoided to prevent loss of habitat for this species. Effects on this species would be minor in magnitude and less than significant.

Northern Leopard Frog

Areas with wetland complexes suitable for northern leopard frog habitat include Rawhide Creek (Segment F – proposed), Hay Creek (Segment F - proposed), and Little Badger Creek (Segment X - proposed). Aquatic habitats would be spanned and structures would be located outside of

these areas. Best management practices also would be implemented to avoid indirect impacts on aquatic ecosystems. As a result, impacts, if any, to the northern leopard frog are expected to be minor as a result of construction, operation, and maintenance of the proposed alignment.

4.7.4.6 *Potential Impacts on Special Status Species from the Alternative Transmission Line Alignment*

Bald Eagle

General types of impacts and mitigation measures and BMPs to minimize the effects would be the same as described for the proposed alignment. Bald eagle nest and roosting sites are not found within or near enough to be affected by construction of the alternative alignment. These critical habitats would therefore not be adversely impacted by the alternative action. However, bald eagles are known to occur in the area during winter and can be found foraging within the project area throughout the year. Using Alternative Segment O would have less impact on important bald eagle habitat than construction and operation of Segment P.

Overall, impacts to bald eagles from the construction and operation of the alternative transmission line and associated features would be less than significant.

Ute Ladies'-Tresses Orchid

No potential habitat for this species was identified during field investigations on segments of the alternative alignment and the species is not known to occur in the area. Since wetland and riparian areas would be spanned, direct and indirect impacts to the Ute ladies'-tresses orchid would be avoided. A preconstruction survey will be required if spanning potential habitat is infeasible. With proper mitigation, the construction and operation of the alternative alignment would have no impact on the Ute ladies'-tresses orchid.

Greater Sage-grouse

Based on aerial surveys and WGFD data from ground surveys conducted in 2006, the alternative alignment could indirectly impact up to nine active lek sites. None of these leks are located within the ROW - they are primarily located within 2 miles, or less, of the ROW. In addition, there are 15 occupied (inactive in 2006) leks within 2 miles of the alternative ROW, six of which are within the actual ROW. Three of the active leks associated with Segment O are located within an existing transmission line corridor. Grouse in the area appear to have adjusted to the presence of the transmission line. However, the addition of a second line may result in the abandonment of these lek areas in the future and would increase perching opportunities as described under the proposed action. In addition, there are 14 occupied (inactive in 2006) leks associated with the alternative ROW and two inactive leks.

Impacts on greater sage-grouse would be similar to those described under the proposed action, with the exception that active leks would not be directly affected by construction of the transmission line. Placing a transmission line in these areas may prevent sage-grouse from re-establishing the areas and would result in habitat fragmentation within the area. Potential habitat exists for the greater sage-grouse within portions of alternative segments Y, U, R, O, G, and B and would be subject to the same potential effects listed above under the proposed transmission line alignment. Further discussion is planned with USFWS and WGFD to determine what would be required to lower the level of impact.

Other Special Status Raptors

Only one ferruginous hawk was observed in the alternative alignment during field surveys. No burrowing owls were observed in the alternative alignment but nesting habitat is present at prairie-dog colonies in Segment Y of the alternative alignment. No peregrine falcons and northern goshawks were observed in the alternative alignment.

Construction and operation of the alternative alignment would have similar effects on special status raptors as those described for the proposed alignment including potential nest abandonment and/or destruction, collision risk with the transmission line, loss of foraging and nesting habitats, and habitat fragmentation. Flight diverters should be placed in areas where active sensitive raptor nests are found.

Other Avian Species of Special Concern

Impacts on neotropical and short-distance migrants would be similar to those described for the proposed transmission line alignment. The alternative alignment would have probable and minor effects on neotropical and short-distance migrants within and adjacent to it and its associated features. The impact to neotropicals and short-distance migrants from construction and operation of the alternative transmission line and associated features would be less than significant.

Columbian Sharp-Tailed Grouse

The previously undocumented lek located within the alternative transmission line corridor in Segment Y could be directly adversely impacted by construction. Potential impacts to Columbian sharp-tailed grouse are similar to those described for greater sage-grouse. With implementation of mitigation measures and BMPs including routing the line 0.25 miles from the lek, seasonal construction restriction, and installation of perch deterrents for 2 miles either side of the lek, impacts to Columbian sharp-tailed grouse could be reduced to minor to moderate and less than significant.

Bats

Impacts on sensitive bat species would be similar to those described for the proposed transmission line. Suitable habitat for these species does exist and the primary possible long-term impact on sensitive bat species within the alternative transmission line area would be potential of collision risk with the transmission line during construction and operation. Bats may also be temporarily displaced or forced to avoid foraging habitats, such as riparian and wetland communities in the medium-term during project construction. Increased human presence and noise are likely to adversely affect bat species over the medium-term in the project area. Incorporation of BMP WF-M2 would minimize the possible minor disturbance and collision-related impacts to bat species within small and site-specific areas. Impacts to bat species would be less than significant.

Swift Fox

Impacts on swift fox would be similar to those described for the proposed transmission line. Although not detected during surveys, the swift fox may be present in the project area and could be displaced from the project area over the medium-term during construction. Increased noise and human presence would likely impact the fox. To avoid impacts to this species, preconstruction surveys will be conducted and structures will avoid burrows to the extent feasible. Since effects would be small and medium-term, effects on this species would be minor in magnitude and less than significant.

Northern leopard frog

Areas with wetland complexes suitable for northern leopard frog habitat include Chicken Creek (Segment R – alternative). Aquatic habitats would be spanned and structures would be located outside of these areas. Best management practices also would be implemented to avoid indirect impacts on aquatic ecosystems. As a result, impacts, if any, to the northern leopard frog are expected to be minor as a result of construction, operation, and maintenance of the alternative alignment.

4.7.4.7 Mitigation Measures for Potential Impacts on Special Status Species

BMPs and potential mitigation measures for ESA-listed species are described in more detail in two BAs, Dry Fork Station Biological Assessment (Basin Electric 2006e) and Hughes Transmission Project Biological Assessment (Basin Electric 2007b).

The measures described in the draft BAs have been incorporated into the analysis of the proposed action and their implementation (or implementation of similar or additional measures as may be determined through consultation) would be expected to prevent any adverse impacts from reaching significance thresholds for listed species. Qualified biologists are required to perform preconstruction surveys, to accompany construction crews, and to evaluate the effectiveness of mitigation. A qualified biologist is degreed or possesses the experience with the species to perform a defensible survey.

In addition to the BMPs (Table 2.4-2), the following mitigation measures are proposed to further minimize potential impacts of the proposed action on special status species:

- **Preconstruction surveys** to document the presence or absence of special status species, should be conducted within suitable habitat, using standardized protocols such as the PRB Wildlife Survey Protocol (BLM 2005), and by a qualified biologist. Surface disturbance activities will not be permitted within 1 mile of the survey area until completion of the survey. If a qualified biologist determines that the ROW does not contain even marginally suitable habitat, consult with appropriate resource agencies for concurrence. Survey areas should correspond to the maximum protection area afforded to the species.
 - Bald Eagle suitable habitat should be surveyed within 2 miles from activity during November through December;
 - Greater sage-grouse breeding habitat should be surveyed 2 miles from the activity during April 1 through May 7;
 - Plains (or Columbian) sharp-tailed grouse breeding habitat should be surveyed 1 mile during April 1 through May 7;
 - Raptor nesting habitat should be surveyed 0.5 mile from activity during April 14 through June 15;
 - Ute ladies'-tresses orchid occurrence should be surveyed in the disturbance area and downstream during July 15 through September 15;
 - Mountain plover nesting habitat should be surveyed 0.25 mile from the activity during May 1 through June 15;
 - Cliff nesting habitat will be surveyed for nests of prairie falcon and peregrine falcon; and
 - Prairie dog colonies will be surveyed for burrowing owls, mountain plover and other species.

- **Minimization**
 - Minimize disturbances to raptors, upland game birds and migratory songbirds to the extent feasible;
 - Minimize potentially disruptive activities and development in the eagles' direct flight path between their nests and roost sites and important foraging areas (BE 2007 Natl. Guidelines); and
 - Minimize the number of trees removed during construction especially in suitable bald eagle roosting and nesting habitat (Basin Electric 2006b). Suitable nesting habitat is any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Suitable roosting habitat is defined as any mature stand of conifer or cottonwood trees.
- **Qualified Biologist.** To ensure construction and maintenance activities do not cause adverse effects to special status species, a qualified biologist will accompany the construction crew, monitor potential effects, and assess effectiveness of mitigation. Biologists will report regularly to program-level managers and resource agencies on the status of impacts and mitigation measures. Resource agency or third-party personnel may accompany crews for independent verification at any time and without notice.
- **Seasonal Timing constraints** for construction and maintenance (operation) in the buffer zones will be employed to mitigate impacts to breeding or nesting avian species. The approximate time constraints for raptors, mountain plover and the greater sage-grouse are as follows:
 - Greater sage-grouse March 1 through June 30
 - Red-tailed hawk March 15 through July 15
 - Ferruginous hawk March 15 through July 15
 - Golden eagle February 15 through July 15
 - Short-eared owl March 15 through August 15
 - Burrowing owl March 15 through August 15
 - Great-horned owl January 1 through July 1
 - Mountain plover April 1 through July 31
- **Year-round Timing Constraint and Nest Buffer Zone for Bald Eagles.** A minimum disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) would be established year-round for all bald eagle nests. No bald eagle nests have been identified within 0.5 mile of the ROW.
 - However, bald eagle nest sites have been identified near the ROWs: one nest near Segment T – along Clear Creek 1.25 mile south of the proposed ROW; and one nest near Segment X – along the Tongue River 1 mile north of the proposed ROW.
- **Seasonal Timing Constraint and Nest/Roost Buffer Zones for Bald Eagles.** (see BMP SS-M3 below).
- **Carrion.** During construction, remove carrion on access roads to avoid artificially feeding bald eagles and putting them at increased risk to collisions with cars. To reduce the chance of vehicle collision with eagles, wildlife, or livestock, speed on all access roads during construction shall not exceed 25 mph.
- **Seasonal Raptor nest buffer zones for construction/maintenance.** No construction or routine (non-emergency) maintenance will be performed within the buffer of active nests during the nesting period or until the young have fledged and are no longer dependent on the nest. Historical records of nests may be used for avoidance during maintenance. A

minimum buffer zone of 0.50 mile for golden eagle nests and 0.25 mile (1,320 feet) for other raptor nests has been proposed.

- **Seasonal Lek Buffer Zones for construction/maintenance.** No construction or routine (non-emergency) maintenance will be performed within the buffer of active or occupied leks during the breeding season. Historical records of leks may be used for avoidance during maintenance. A minimum buffer zone of 0.25 miles for active or occupied leks has been proposed. Thus, leks within 0.25 miles of the ROW will be protected by the timing of construction outside the breeding season.
 - Lek Buffer zones of greater distances will offer greater protection and may be modified based on consultation with state and federal resource agencies. The Wyoming Greater Sage-Grouse Conservation Plan recommends that construction should be completed at least 0.60 mile (3,168 feet) from leks (WGSCP 2003).
- **Additional mitigation and coordination.** Construction will occur to the greatest extent feasible outside of the avian breeding season. If construction occurs during the avian breeding season and within the buffer zone of active nests or occupied leks, appropriate mitigation measures will be established in coordination with the USFWS and WGFD to avoid disturbing birds during the nesting season. A qualified biologist will be present to monitor potential disturbances to raptors or grouse if construction must occur during the nesting or breeding seasons within the buffer zones.
- **Active raptor nests.** If the ROW or power plant site contains active nests or encroaches on the buffer zones of active raptor nests, additional mitigation may be required. Topography, vegetation cover, and existing land use may play a role in the proposed mitigation. Relocation of nests may be proposed outside of the nesting period (timing constraint) with the concurrence of resource agencies. A qualified biologist will be present during construction near active raptor nests to monitor potential disturbances to raptors.
- **Inactive raptor nests.** If inactive nests occur in the construction areas and avoidance is not feasible, an application to relocate will be submitted to the appropriate resource agency.
- **Nesting platforms** will be installed in suitable areas if nesting trees are removed (Basin Electric, 2006b).
- **Perch deterrents.** To minimize the use of transmission towers by raptors as perches to prey on sage-grouse in nearby leks, perch deterrents should be used at a minimum on transmission towers or structures located 0.5 mile from active or occupied leks and extend one span or two miles beyond the sensitive area. The PRB O&G Project requires perch deterrents and flight diverters on power poles and distribution lines within 0.5 miles (2640 ft) of any sage-grouse breeding grounds (i.e., leks) (DOI 2003).
 - The effectiveness of this measure to mitigate impacts and to reduce predation is uncertain. Perch deterrents may reduce predation by raptors in areas of low prey densities but raptors may still try to land on towers or poles located near concentrations of prey (MSGWG 2005).
- **Flight diverters.** To minimize the risk of avian collisions with transmission lines, flight diverters should be used at a minimum on transmission lines located within 0.5 miles of an active or inactive golden eagle nest. Golden eagle nests have been identified near the ROWs of Segment T (1 of 3 inactive within 0.5 mile; other 2 active greater than 1.5 miles) and Segment F. Per the BMP SS-M3, diverters will be installed near the bald

eagle roost sites along Segment N and along segments that span Clear Creek (Segment T), Prairie Dog Creek (Segment X), the Powder River (Segment S) and Chicken Creek Reservoir/Chicken Creek/Spotted Horse Creek (Segment Q)

- Flight diverters are also proposed along segments that span significant waterbodies including Clear Creek (Segment T), Prairie Dog Creek (Segment X), the Powder River (Segment S) and Chicken Creek Reservoir/Chicken Creek/Spotted Horse Creek (Segment Q); and
- Additional mitigation may be implemented if flight diverters are installed on all crossings (BLM 2003) and routings near perennial streams or reservoirs including Segment L crossing Wildcat Creek and Segment H crossing Wild Horse Creek.
- **Mitigation monitoring.** Implementation of a monitoring program should be included to evaluate the effectiveness of existing mitigation and the need for additional measures (DOI 2003).
- **Ute ladies'-tresses orchid.** No records of the federally-listed Ute ladies'-tresses orchid in the project area are known although its occurrence is possible in large herbaceous riparian communities.
 - **Avoidance.** The transmission line will span all riparian and wetland communities. Similarly, the power plant site will avoid wetlands to the extent possible.
 - **Pre-construction surveys** will be conducted by a qualified botanist in suitable habitat using standard protocols during an appropriate time as stated above.
 - Surveys for this species are difficult due to its unpredictable emergence of flowering parts.
 - Drainages with suitable herbaceous wetlands that may support the Ute ladies'-tresses orchid, occur along cutoff sections of Little Badger Creek (Segment X) and along Rawhide Creek (Segment F).
 - **Qualified Biologist.** To ensure impacts on orchids are avoided, a qualified biologist should be present when construction occurs in suitable habitat (wetlands and riparian areas).
 - **Erosion and sediment control** measures will reduce the potential impacts to in-stream habitat
 - **Noxious weeds.** An effective Weed Management Plan will decrease the potential to spread noxious and invasive weeds that could reduce the amount of habitat available to the orchid.
- **Mountain Plover.** Large prairie-dog colonies provide habitat for this grassland bird which is protected under the MBTA but is no longer proposed for federal-listing as threatened. It has not been observed in the transmission line project area but potential habitat occurs in Segments X-W, S-Q, P, A, and AA.
 - **Pre-construction surveys** will be conducted for this species by a qualified biologist using standard protocols during an appropriate time as stated above.
 - Mountain plovers may be attracted to the bare ground during intermittent construction and begin nesting. Continuous activity is likely to prevent establishment of nests.
 - **Avoidance.** Identification and avoidance of mountain plover nesting areas and minimization of disturbances to prairie dog colonies would reduce the potential impacts to the species.

BMPs for Special Status Species and Bald Eagles include the following:

Special Status BMP SS-M1. Pre-construction clearance nesting bird surveys would be conducted if construction is to occur during the nesting season to comply with the MBTA. Nest disturbance would be avoided as required under the MBTA.

Special Status BMP SS-M2. Coordinate with the USFWS and the WGFD and comply with the terms and conditions of any mitigation plan for threatened, endangered, and special status species that would be developed and approved by those agencies prior to construction.

- Restrict construction and development in mountain plover habitat during the peak breeding season (April to July) if mountain plovers are found within the ROW during pre-construction surveys.
- Minimize the use of pesticides or herbicides during the Columbian sharp-tailed grouse brood rearing season of May 15 to July 15 (applicable to the Alternative Transmission Line Alignment only).
- Retain large deciduous trees in open sagebrush shrubland and grassland habitats since they provide nesting habitat for sensitive raptor species.
- Place perch deterrents within greater sage grouse concentration areas, particularly near active lek sites, nesting and other concentration areas (e.g., brood rearing habitat; wintering habitat).
- Place flight diverters in areas that span riparian and wetland communities, large drainages, and reservoirs.
- Adhere to avian species-specific construction (timing) constraint windows as established through coordination with USFWS and WGFD to mitigate impacts during breeding season.
- Consultation with WGFD will be conducted to determine appropriate and feasible buffers for this project.

Special Status BMP SS-M3. Measures to Protect Bald Eagle:

- The area within one mile of the proposed centerline would be surveyed immediately before construction begins to ensure that any new bald eagle activity areas are detected.
- If new bald eagle nests are found within one mile of the proposed line, additional consultation would be conducted with the USFWS to develop new conservation measures for this site based on the National Bald Eagle Management guidelines before construction begins.
- A seasonal (February 1 through August 15) disturbance-free buffer zone of one mile would be established for all bald eagle nest sites (both active and alternate nest sites). An alternate nest is a nest that is not used for breeding by eagles during a given breeding season.
- A seasonal (November 1 through April 1) disturbance-free buffer zone of one mile would be established for all roost sites. This zone applies specifically to the known roost sites along segment N, as well as any other roost sites in the project area. This buffer zone and timing may be adjusted based on site-specific information through coordination with USFWS.
- The project would follow APLIC guidelines for avian protection (APLIC 1994; Basin Electric 2006b).

- Bird flight diverters would be installed near the bald eagle roost site along Segment N and along segments of the line which span Clear Creek, Prairie Dog Creek, and the Powder River.
- Basin Electric would avoid removing single standing trees in the project area during construction and operation to the extent possible. Basin Electric would select routes through riparian corridors that would cause minimal removal of mature cottonwood and other riparian tree species.
- Non-emergency maintenance activities within one mile of bald eagle roost sites would be scheduled outside of the winter period (November 1 through April 1) whenever feasible, and between 9:00 a.m. and 3:00 p.m. whenever bald eagles are present at the roost site.
- In the event that a dead or injured bald eagle is located during construction or maintenance, the USFWS' Wyoming Field Office (tel.: 307-772-2374) and the USFWS' Law Enforcement Office (tel.: 307-261-6365) would be notified within 24 hours.
- In addition to monitoring avian use of the wastewater pond, the water quality would also be periodically monitored to assess sodium concentrations in the water. If sodium concentrations are elevated above the USFWS maximum tolerance level of 17,000 mg/L, Basin Electric would work with USFWS to identify the method and type of exclusionary systems that can be implemented to prevent avian species from accessing the pond.

4.7.4.8 *Summary of Potential Impacts on Special Status Species*

Potential impacts on special status species from the proposed and alternative power plants and transmission lines, which would be reduced with BMPs and other mitigation measures, include habitat fragmentation, loss and degradation of suitable habitat, risk of collision with transmission lines, increased raptor predation and human disturbance from construction, operation, and maintenance. With strict implementation of all BMPs and mitigation measures developed in consultation with USFWS and WGFD, no take of listed species is anticipated, and impacts on special status species are expected to be less than significant.

Construction and operation of the power plant at the proposed and alternative sites may affect, but are not likely to adversely affect, the bald eagle. This determination is based on the distance between the sites and known bald eagle nesting and roosting sites and the implementation of BMPs and conservation measures, including monitoring of wildlife use and contaminant levels in the wastewater pond and associated mitigation, if necessary. The possible effect of the project on foraging bald eagles is expected to be negligible.

Potential impacts to bald eagles from construction and operation of the transmission line would be reduced by mitigation measures including preconstruction surveys, seasonal time constraints, disturbance buffers, nest avoidance, and flight diverters to avoid disturbances and take.

Due to the potential loss of sagebrush shrubland habitat by development of the alternative power plant site, a moderate impact to greater sage-grouse use and nesting habitat would be probable. However, this site is surrounded by mining disturbance, does not provide suitable lek habitat, and the species is not known to occur within the alternative site, so the probable moderate magnitude impact to sage-grouse resulting from native sagebrush removal required for construction of the alternative power plant would be less than significant. The proposed power

plant site contains primarily disturbed grasslands and thus does not represent likely sage-grouse habitat.

Because wetland and stream habitats would be avoided and buffered at the proposed and alternative power plant sites and transmission line alignments, no adverse impacts on Ute ladies'-tresses orchid are expected.

Impacts to greater sage-grouse from the construction and operation of the proposed and alternative transmission line alignments could be moderate to major due to increased risk of predation from raptors and lek abandonment. With strict implementation of mitigation measures and BMPs, including compliance with lek buffers, seasonal restrictions, flight diverters, and perch deterrents, lek abandonment would likely be reduced and impacts on greater sage-grouse would be less than significant.

Impacts to the Columbian sharp-tailed grouse from the construction and operation of the alternative alignment (Segment Y) would be reduced to less than significant with implementation of mitigation measures and BMPs including routing the line 0.25 miles from the lek, seasonal construction restrictions, and installation of perch deterrents for 2 miles either side of the lek.

With implementation of BMPs and adherence to any further mitigation provided by USFWS and WGFD, all other impacts on special status species from all project components would be less than significant and reduced to minor to moderate in magnitude.

4.8 LAND RESOURCES

For the purposes of this discussion, land resources include land use (e.g., grazing, agricultural, residential, commercial, industrial, etc.) and land status (e.g., ownership, zoning, and land use planning). Chapter 2 includes three BMPs, LR-M1, LR-M2, and LR-M3, which are relevant to land resources.

4.8.1 Impact Criteria

Tables 4.8-1 and 4.8-2 present the detailed significance criteria used to evaluate land resources and define the significance threshold for the Dry Fork Station and Hughes Transmission Line, respectively.

Table 4.8-1 – Issues and Significance Criteria for Land Use and Associated Resources, Including Rangeland, Agriculture, and Prime Farmlands –Power Plant

Dry Fork Station Issues Identified in Scoping	Significance Threshold: An effect would be considered significant if it results in the permanent loss of 25% or more of a particular land use in Campbell County. The total amount of rangeland in Campbell County is equal to 441,885 acres.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Patterns of land ownership (federal, state, and private) • Land status (parks, wildlife areas, wilderness study areas (WSAs), and conservation easements) • Proximity to development (residential, subdivisions, and industrial) • Coal mines/mineral ownership • Oil and gas development (conflicts with CBM pipelines, well sites, and pits) • Airports (distance and approach) • Prime agricultural lands • Effects on livestock grazing and agricultural operations (pastures, irrigation, and elk ranching) • Access (new road effects, even with reclamation) 	Magnitude		
	Major	Change in land use affecting 25 percent or more of the project study area. Farmland/rangeland is permanently removed from productive use.	Assessment of impact based on amount of land affected. Comparison of existing land uses before and potential land uses after project completion.
	Moderate	Change in land use impacting 10-25 percent of the rangeland in Campbell County.	
	Minor	Change in land use impacting less than 10 percent of land in the project study area. Farmland/rangeland is temporarily removed due to construction and/or access requirements.	
	Duration		
	Long-term	Those that would last greater than 1 year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last between 1 month and 1 year (limited or intermittent).	
	Short-term	Those that would last less than 1 month.	
	Extent		
	Large	Impacts to a large area beyond the EIS Study Area.	Assessment of impact based on size of area affected.
	Medium	Impacts limited to project site and EIS Study Area.	
	Small	Impacts limited to immediate project site.	
	Likelihood		
	Probable	Impacts very likely to occur during construction and/or operation.	Assessment of probable impact.
	Possible	Moderate potential for impacts to occur during construction and/or operation.	
	Unlikely	Little to no potential for impacts to occur during construction and/or operation.	

4.8.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.8.3 Power Plant

4.8.3.1 Proposed Site

Construction

Construction of the proposed Dry Fork Station would not significantly impact land resources according to the significance criteria defined in Tables 4.8-1 and 4.8-2.

Landownership Patterns and Land Status

There would be no impact on landownership patterns for federal, state, and privately owned lands or land status (parks, wildlife areas, wilderness study areas (WSAs), and conservation easements). The land associated with the power plant is currently in private ownership within a mine permit area and would remain in private ownership, and there are no parks, wildlife area, WSAs, or conservation easements at the plant location.

Proximity to development (residential, subdivisions, and industrial)

Industrial development is limited to coal mines surrounding the project area (see below). There are no subdivisions in proximity (existing or planned). The nearest residence is approximately 2 miles north of the site and would not be affected by construction of the power plant.

Availability of existing corridors (transmission lines, railroads, roads [local, state, interstate], pipelines, and communication lines)

Impacts on roads and railroads are discussed in the Transportation Section. There would be no impact on availability of existing corridors (transmission lines, railroads, roads [local, state, interstate], pipelines, and communication lines).

Coal Mines and Mineral Ownership

Industrial development (coal mines) surrounding the project area would not be affected by construction of the power plant.

Oil and gas development (conflicts with CBM pipelines, well sites, and pits)

Construction of the proposed Dry Fork Station Power Plant would preclude invasive mining for coal, oil, or gas on the project site for the duration of the project (60 years). If the station were decommissioned at the end of its useful life, mining could again be considered.

Airports

No airport facilities or flight patterns would be affected by the proposed Dry Fork Station Power Plant.

Prime Agricultural Lands

There are no prime agricultural lands within the project area; consequently, there would be no impact.

Effects on livestock grazing and agricultural operations (pastures, irrigation, and elk ranching)

The property owner currently leases grazing rights at the site and would terminate these rights if the project goes forward. The proposed action would not conflict with existing or planned grazing on adjacent lands, as the site would be fenced and gated, allowing grazing to take place on surrounding properties without conflict.

Operation

Operation of the proposed Dry Fork Station would not significantly impact land resources according to the significance criteria defined in Section 4.8.1.

Table 4.8-2 – Issues and Significance Criteria for Land Use and Associated Resources Including Rangeland, Agriculture, and Prime Farmlands –Transmission Line

Hughes Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it results in the permanent loss of 25 percent or more of a particular land use in Campbell and Sheridan counties. An effect would also be considered significant if it would cause major impacts to existing or planned land uses, rangeland, and/or farmland outside the project ROW.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Patterns of land ownership (federal, state, private) • Land status (parks, wildlife areas, wilderness study areas, conservation easements) • Proximity to development (residential, subdivisions, industrial) • Availability of existing corridors (transmission lines, railroads, roads [local, state, interstate], pipelines, communication lines) • Coal mines/mineral ownership • Oil and gas development (conflicts with CBM pipelines, well sites, pits) • Airports (distance, approach) • Prime agricultural lands • Effects on livestock grazing and agricultural operations (pastures, irrigation, elk ranching) • Access (new road effects, even with reclamation) 	Magnitude		
	Major	Change in land use affecting 25 percent or more of the rangeland in Campbell and Sheridan counties. Large number of takings or preclusion of other uses within vicinity of project. Farmland/rangeland is permanently removed from productive use.	Assessment of ROW, pole placement, access roads, fencing, road crossings, and staging area locations. Comparison of existing land uses before and potential land uses after project completion.
	Moderate	Change in land use impacting 10-25 percent of the rangeland in Campbell and Sheridan counties.	
	Minor	Change in land use impacting less than 10 percent of the rangeland in Campbell and Sheridan counties. Farmland/rangeland is temporarily removed from production due to construction and/or access requirements.	
	Duration		
	Long-term	Those that would last greater than one year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last between one month and one year (limited or intermittent).	
	Short-term	Those that are less than one month.	
	Extent		
	Large	Impacts more than 500 feet from the center line and associated lay-down/staging areas. Impacts more than 250 feet from the center line and associated lay-down/staging areas for CBM.	Assessment of impact based on size of area affected.
	Medium	Impacts within 500 feet of the center line and associated lay-down/staging areas. Impacts within 250 feet from the center line and associated lay-down/staging areas for CBM.	
	Small	Impacts to the ROW and associated lay-down/staging areas.	
	Likelihood		
	Probable	The impact is very likely to occur under typical operating conditions.	Assessment of existing land uses along the project alignment. The potential impact will depend on each existing land use.
	Possible	The impact occurs under worst-case operating conditions.	
Unlikely	The impact occurs under upset/malfunction conditions.		

Because the site is not subject to any known zoning, land use plan, or growth management plan, the Industrial Siting Council Permit designated the proposed action site for mining or other industrial purposes, and the character of the surrounding area is industrial, the change in land use is considered less than significant. Impacts on developments, airports, oil and gas, agricultural lands, grazing, access roads, and corridors would be the same as described for construction.

4.8.3.2 *Alternative Site*

Construction

Impacts from construction of the alternative Dry Fork Station Power Plant would be the same as the proposed power plant. There would be no impact on land resources according to the significance criteria defined in Section 4.8.1.

Operation

Operation of the alternative power plant would not significantly impact land resources according to the significance criteria defined in Section 4.8.1. The nearest residence is approximately one mile east of the alternative power plant site and land use here would not be affected by operation of the alternative power plant.

4.8.4 **Transmission Line**

4.8.4.1 *Proposed Alignment*

Construction

Construction of the proposed transmission line would not significantly impact land resources according to the significance criteria defined in Section 4.8.1. Those residences near the transmission line could be inconvenienced with noise and activity levels not typical of a rural setting during construction. More discussion of potential noise impacts is provided in Section 4.6. Operation impacts to land resources are discussed below.

Operation

Operation of the proposed transmission line would not significantly impact land resources according to the significance criteria defined in Section 4.8.1. Moderate impacts are expected on residences that are within 500 feet of the transmission line. Minor impacts are expected with regards to agricultural lands, including prime farmlands, land ownership, rangelands, radio or communication towers, and CBM wells.

Residences

Impacts on residences would be minor and long-term. No residences are within the 125-foot ROW. The center line of the proposed alignment would be within 500 feet of 3 residences and within 0.5 mile of 41 residences (see Table 3.8-2).

Airports

No airport facilities or flight patterns would be affected by either the proposed or the alternative transmission line alignment.

Agricultural Lands

According to the significance criteria discussed in Section 4.8.1, minor impacts are expected on agricultural lands, including prime farmlands that are located within the proposed route ROW.

Prime farmlands exist along approximately 2 miles of the proposed transmission line alignment. Approximately 871 square feet (0.02 acre) of prime farmland would be permanently removed

from production in order to build the transmission line structures. Though this impact is highly likely and permanent, the land area is so small that the impact is considered less than significant. In accordance with BMP LR-M3 the transmission line would be routed along the edges of irrigated fields, or would span fields to the extent feasible to minimize impacts to agricultural lands.

Land Ownership

Less than significant impacts are expected on land ownership. The siting of a new transmission line requires that necessary land rights be obtained for the project facilities, including access, construction, and operations and maintenance. These land rights would generally take the form of easements where the fee ownership remains with the landowners. The majority of the easements would be obtained from private landowners, with additional easements granted across state and federal (BLM) land (Basin Electric 2006b). See Section 2.2.2.2 for further discussion of this process.

Livestock Grazing

Less than significant impacts are expected on grazed rangelands. Open grazing should be able to continue on almost all land both during and after construction. Since grazing disturbances in any given area would be limited to less than one month during the construction schedule, these impacts are considered short-term.

Coal Bed Methane Wells

Minor impacts are expected to CBM wells. As shown in Table 3.8-4, 36 CBM wells are within 250 feet of the centerline of the proposed route. Data specifying the exact location of the CBM wells were not available. The transmission line would be sited to minimize conflicts with the existing CBM wells and associated piping and other structures (Basin Electric 2006b). If conflicts with wells and/or ancillary structures could not be resolved by appropriate siting, Basin Electric would work with the well owners to devise an acceptable solution.

4.8.4.2 *Alternative Alignment*

Construction

Construction of the alternative alignment would not significantly impact land resources according to the significance criteria defined in Section 4.8.1.

The alternative route would be within 500 feet of 14 residences and within 0.5 mile of 84 residences (see Table 3.8-2). Prime farmlands exist along approximately 4 miles of the alternative transmission line. Approximately 1742 square feet (0.04 acres) of prime farmland would be permanently removed from production in order to build the transmission line structures. Though this impact is highly likely and permanent, the land area is so small that the impact is considered less than significant. In accordance with BMP LR-M3, the transmission line would be routed along the edges of irrigated fields, or would span fields to the extent feasible to minimize impacts to agricultural lands.

Operation

Operation of the alternative transmission line would not significantly impact land resources according to the significance criteria defined in Section 4.8.1.

4.8.5 Conclusions

Neither the proposed or alternative Dry Fork Station Power Plant, nor the proposed or alternative transmission line alignment, would significantly impact land resources according to the significance criteria discussed in Section 4.8.1 during either construction or operation. Moderate impacts are expected on residences. Minor impacts are expected on agricultural lands, including prime farmlands, land ownership, rangelands, radio or communication towers, and CBM wells.

4.9 RECREATION, WILDERNESS, AND AREAS OF CRITICAL ENVIRONMENTAL CONCERN

For the purposes of this discussion, recreational resources are defined as designated recreational opportunities or facilities; existing or proposed wilderness areas (including wilderness study areas and wild and scenic rivers); and existing or proposed areas of critical environmental concern.

4.9.1 Impact Criteria

Tables 4.9-1 and 4.9-2, which can be found beginning on the next page, present the detailed significance criteria used to evaluate recreational resources and define the significance thresholds. There are no BMPs associated with recreation, wilderness or areas of critical environmental concern.

4.9.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.9.3 Power Plant

4.9.3.1 Proposed Site

Construction

As described in Section 3.9, no designated recreational resources, existing or proposed wilderness areas, or existing or proposed Areas of Critical Environmental Concern (ACECs) are on, or adjacent to, the site. Therefore, construction of the Dry Fork Station would have no impact on recreational resources according to the significance criteria discussed in Section 4.9.1.

Operation

Operation of the proposed action would have no impact on recreational resources according to the significance criteria discussed in Section 4.9.1.

Table 4.9-1 – Issues and Significance Criteria for Recreation, Wilderness, and Areas of Critical Environmental Concern – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant if it results in the permanent loss of recreational opportunities, an area of critical environmental concern, or designated or proposed wilderness.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> • Recreational opportunities and facilities • Areas of critical environmental concern • Wilderness and proposed wilderness (Wilderness Study Areas, Wild and Scenic Rivers) 	Magnitude		
	Major	The project results in the elimination of areas of prime and unique recreational opportunities or facilities as designated by federal, state, and/or local government. The project results in the elimination of areas of critical environmental concern or wilderness or proposed wilderness areas as designated by the federal, state, and/or local governments.	Assessment of the power plant, access roads, fencing, road crossings, and staging area locations. Operation and future maintenance of the plant site, relative to designated recreation areas.
	Moderate	The project results in a reduction of recreational opportunities within the area.	
	Minor	The project results in a slight modification of recreational opportunities within the project area.	
	Duration		
	Long-term	Those that would last greater than 1 year (or during critical periods).	Project construction and operation schedule.
	Medium-term	Those that would last between 1 month and 1 year (limited or intermittent).	
	Short-term	Those that would last less than 1 month.	
	Extent		
	Large	Impacts to a large area beyond the project site.	Location of the power plant and all ancillary features related to designated recreation.
	Medium	Impacts limited to project site and surrounding area.	
	Small	Impacts limited to immediate project site.	
	Likelihood		
	Probable	Impacts very likely to occur during construction and/or operation.	Location of designated recreation areas relative to power plant construction and operation. Distance of the power plant and all ancillary facilities to the areas of recreational use.
	Possible	Moderate potential for impacts to occur during construction and/or operation.	
	Unlikely	Little to no potential for impacts to occur during construction and/or operation.	

4.9.3.2 Alternative Site

Construction

No designated recreational resources, existing or proposed wilderness areas, or existing or proposed ACECs are on or adjacent to the site. The nearest recreational opportunities and wilderness areas are similar to those described for the proposed action. Construction of the alternative power plant would have no impacts on recreational resources according to the significance criteria discussed in Section 4.9.1.

Operation

Operation of the alternative action would have no impact on recreational resources according to the significance criteria discussed in Section 4.9.1.

4.9.4 Transmission Line

4.9.4.1 Proposed Alignment

Construction

Construction of the proposed transmission line would have less than significant impacts on recreational resources according to the significance criteria discussed in Section 4.9.1. No designated recreational opportunities or facilities, existing or proposed wilderness areas, or existing or proposed ACECs are on or adjacent to the project corridor (Basin Electric 2006b). There would be no impact on wilderness or ACECs based on the criteria in Section 4.9.1.

Off-highway vehicle use of the area may increase slightly during construction as drivers take advantage of temporary overland access routes created by construction equipment. Creation of temporary overland access routes would be minimized by use of existing roads, and vegetation along these routes is expected to recover quickly when the access routes are no longer in use. Basin Electric would block or reclaim any access roads or trails identified by the landowner, county, or BLM, if requested, to prevent future access by the public (Basin Electric 2006b). Because the land would be obtained via long-term easements from current property owners, the project corridor would not be fenced and persons currently accessing the site for hunting, off-highway driving, camping, or hiking would likely be able to continue to access the area (Basin Electric 2006b).

These impacts would be considered of minor magnitude, long-term duration, small extent and medium likelihood.

Operation

Effects as a result of project operation and maintenance of the transmission line would be similar to those described under construction. Operation of the proposed transmission line would have no impact on recreational resources according to the significance criteria discussed in Section 4.9.1.

Table 4.9-2 – Issues and Significance Criteria for Recreation, Wilderness, and Areas of Critical Environmental Concern – Transmission Line

Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it results in the permanent loss of recreational opportunities, an area of critical environmental concern, or designated or proposed wilderness.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Recreational opportunities and facilities Areas of critical environmental concern Wilderness and proposed wilderness (Wilderness Study Areas, Wild and Scenic Rivers) 	Magnitude		
	Major	The project results in the elimination of areas of prime and unique recreational opportunities or facilities as designated by federal, state, and/or local government. The project results in the elimination of areas of critical environmental concern or wilderness or proposed wilderness areas as designated by the federal, state, and/or local governments.	Assessment of ROW, pole placement, access roads, fencing, road crossings, and staging area locations. Operation and future maintenance of the transmission line, relative to designated recreation areas.
	Moderate	The project results in a reduction of recreational opportunities within the area.	
	Minor	The project results in a slight modification of recreational opportunities within the project area.	
	Duration		
	Long-term	Those that would last greater than 1 year (or during critical periods).	Project construction schedule.
	Medium-term	Those that would last between 1 month and 1 year (limited or intermittent).	
	Short-term	Those that would last less than 1 month.	
	Extent		
	Large	Impacts more than 300 feet from the ROW and associated lay-down/staging areas.	Location of the ROW, pole placement, access roads, fencing, road crossings, and staging area locations. Operation and future maintenance of the transmission line relative to designated recreation, areas of critical environmental concern, and/or designated/proposed wilderness.
	Medium	Impacts within 300 feet of the ROW and associated lay-down/staging areas.	
	Small	Impacts to the ROW and associated lay-down/staging areas.	
	Likelihood		
	Probable	Impacts very likely to occur during construction and/or operation.	Location of designated recreation areas, areas of critical environmental concern, and designated or proposed wilderness relative to power plant construction and operation.
	Possible	Moderate potential for impacts to occur during construction and/or operation.	
	Unlikely	Little to no potential for impacts to occur during construction and/or operation.	

4.9.4.2 *Alternative Alignment*

Construction

Construction of the alternative corridor would have no impact on recreational opportunities and no impact on wilderness or ACECs according to the significance criteria discussed in Section 4.9.1.

Operation

Operation of the alternative corridor would have no impact on recreational resources according to the significance criteria discussed in Section 4.9.1. Other issues associated with operation are similar to those described for the proposed corridor

4.9.5 Conclusions

The proposed or alternative power plant and the proposed or alternative transmission line, would have less than significant impacts on recreational resources within the project study area. No aspect of the project requires any modification to any existing or proposed recreational resources.

4.10 VISUAL RESOURCES

Both the proposed Dry Fork Station and the proposed Hughes Transmission Line alignment could have an impact on visual resources. Light from the plant's operations and security lighting system was identified during the public scoping process as the primary potential issue relating to visual quality. Another possible impact is the potential for skylining (or instances where structures are silhouetted against the sky).

4.10.1 Impact Criteria

Determining potential visual impacts requires an appraisal of the area's inherent scenic quality, assessment of public concern and management direction for scenic quality, and an evaluation of the degree of contrast of proposed projects. This process includes the following steps:

- Inventorying the existing landscape character or scenic condition;
- Establishing Key Observation Points (KOPs) near each of the proposed sites to evaluate visual impacts;
- Evaluating the degree of change from existing conditions for each KOP through a systematic contrast rating process using photographic simulations of the proposed actions, as needed;
- Measuring the extent and duration of impact to travelways, use areas, and residences;
- Assigning an impact rating to the proposed action and the alternatives; and
- Developing mitigation measures to reduce significant visual impacts of the proposed project.

For the generating stations, one KOP was selected for each site from SH 59 and Garner Lake Road (Figure 4.10-1). Locations were selected to be representative of typical views of the proposed and alternative power plant sites as seen by a casual observer and to portray potential impacts that could occur along primary travelways.

For the transmission line alignments, KOPs were selected along the proposed travelways at locations chosen to represent typical views of the proposed and alternative transmission lines as seen by a casual observer and to portray potential impacts that could occur along primary routes and use areas (Figure 4.10-2).

To assess the magnitude of project-related visual impacts in the study area, the VRM system contrast rating process (BLM Manual 8431) is used at each KOP to compare the existing visual setting to the proposed level of change in the landscape and whether the change conforms to VRM classes. The degree of change can be measured by comparing the project's features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the proposed action and alternative action sites. Although the BLM rating system is technically not applicable to private land, the rating system provides a useful, consistent measurement of project-induced change.

To further characterize the anticipated long-term appearance of the proposed project and the magnitude of change to the existing scenic quality and the viewer's experience, a photographic simulation was prepared for each site by overlaying the proposed facilities onto photographs of existing conditions.

Tables 4.10-1 and 4.10-2 present the significance criteria for visual resources.

4.10.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.10.3 Power Plant

4.10.3.1 Proposed Site

Construction

Short-term components and activities that would contrast with the existing visual character include an increase in employee and construction traffic, site clearing and associated dust, borrow pit excavation and reclamation, commissioning (steam blowout), and well drilling. These activities would likely create contrasts of moderate to major magnitude and medium to large extent of short duration in the foreground-middleground distance zone, depending on the phase of construction and location of the viewer. In addition, construction cranes and other elevated construction equipment would be illuminated in accordance with Federal Aviation Administration requirements. General facility lighting would also be installed during the construction period. Impacts from construction activities that change the landscape character would be temporary, and therefore, would be less than significant.

Operation

Aside from a periodic steam plume, there should be no visible emission from the boiler stack. The project would be required to meet an opacity standard, and opacity of the exhaust would be monitored continuously using a continuous opacity monitor.

Under most meteorological conditions, the atmosphere would be unsaturated and would provide enough mixing so that the water vapor in the boiler exhaust would not condense. During certain atmospheric conditions (that is, when the atmosphere is nearly saturated, winds are light, and mixing is very low such as during some early morning hours), water vapor in the main plume may condense to form a visible white plume. However, under most conditions, the visible water droplets would quickly re-vaporize. In addition, an auxiliary wet cooling tower is proposed and a visible plume may periodically be seen from this plant component.

Certain components of the proposed action lie horizontal relative to the ground plane and thus would be highly visible in the foreground (and, to a lesser extent, in the middleground) from State Highway (SH) 59 for approximately 2 miles, as shown in a photo simulation for the proposed action (Figure 4.10-3).

These components are:

- Paved roads and parking areas on the Dry Fork Station site;
- Highway modifications and access points from SH 59;
- Storm water channels;
- Wastewater pond;
- Switchyard, rail spur, and upgrades to existing rail lines; and
- Conveyor belt.

Other facilities that would be highly visible from SH 59, but in most instances within the foreground-middleground distance zone, include the electric transmission connection; solid waste landfill; air-cooled condenser; ancillary fuel-handling and ash collection facilities; water wells; security fencing; signage; and administrative, maintenance, and warehouse buildings. The extent of the visibility of these components encompasses limited portions of US 14/16, SH 59, Garner Lake Road, and a limited number of residential subdivisions.

Project components would affect the visual character and quality of the site and surroundings because they would be highly visible in the foreground (and, to a lesser extent, in the middleground). The engineered appearance of the project's components contrasts with the forms, lines, colors, and textures of the existing landscape character. The proposed project would involve major changes to the area's visual landscape. Although the changes would be long-term, they would not affect a relatively large area. Also, the proposed site has been disturbed by previous activities.

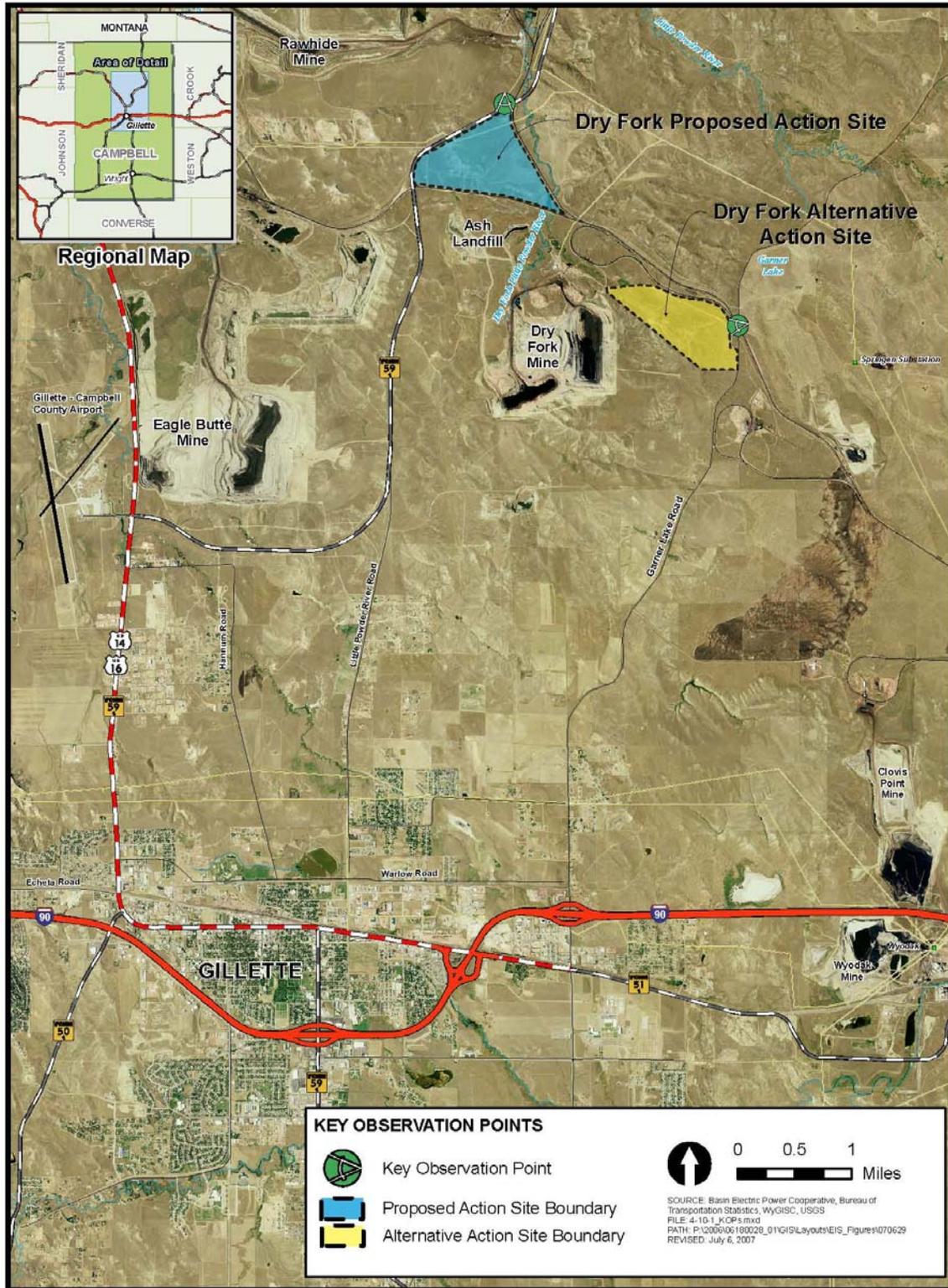


Figure 4.10-1 – Power Plant Key Observation Points

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Figure 4.10-2 – Transmission Line Key Observation Points

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Table 4.10-1 – Issues and Significance Criteria for Visual Resources – Power Plant

Power Plant Issues Identified	Significance Threshold: An effect would be considered significant where the visual degree of contrast of the proposed project would exceed any regulatory guidelines for an area.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Visual resources, including light pollution and skylining. 	Magnitude		
	Major	The element contrast would demand attention, would not be overlooked, and would be dominant in the landscape.	Key Observation Point (KOP) existing conditions photography and photo-simulations.
	Moderate	The element contrast would begin to attract attention and to dominate the characteristic landscape.	
	Minor	The element contrast would be seen, but would not attract the attention of the casual observer. The existing character of the landscape is retained.	
	Duration		
	Long-Term	Throughout the life of the project, or 5 years or more.	Proposed and alternative project descriptions.
	Medium-Term	N/A	
	Short-Term	During all or part of the construction phase of the project not to exceed 5 years.	
	Extent		
	Large	Project components or activities would be highly visible across large portions of the foreground, middleground, and background distance zones of the analysis area or across large portions of primary use areas, residences, and travelways.	Viewshed analyses using tall project components to determine extent and distance to which facilities may be visible within the analysis area, especially as visibility relates to primary use areas, residences, and travelways.
	Medium	Project components or activities would be highly visible across foreground and middleground portions of the analysis area or across portions of use areas, residences, and travelways.	
	Small	Highly visible project components or activities would be limited to foreground portions of the analysis area and limited portions of use areas, residences, and travelways, if any.	
	Likelihood		
All visual effects are considered probable because they would be caused by specific components of the project.			

Table 4.10-2 – Issues and Significance Criteria for Visual Resources – Transmission Line

Proposed Transmission Project Issues Identified	Significance Threshold: An effect would be considered significant where the visual degree of contrast of the proposed project would exceed any regulatory guidelines for an area.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> The transmission line would affect the aesthetics of relatively undisturbed landscapes; potential for skylining or instances when structures are silhouetted against the sky. 	Magnitude		
	Major	The element contrast would demand attention, would not be overlooked, and would be dominant in the landscape.	KOP existing conditions photography and photo-simulations.
	Moderate	The element contrast would begin to attract attention and begin to dominate the characteristic landscape.	
	Minor	The element contrast would be seen but would not attract attention, nor would it be visible or perceived.	
	Duration		
	Long-Term	Longer than 60 months.	Proposed and alternative project descriptions.
	Medium-Term	Impact duration greater than construction period up to 60 months.	
	Short-Term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Project components or activities would be highly visible across large portions of the foreground and middleground distance zones of the analysis area or over large portions of travelways or large numbers of primary use areas and residences.	Pole frequency viewshed analyses using 500-foot pole spacing to determine extent and distance to which facilities may be visible in relation to primary use areas, residences, and travelways.
	Medium	Project components or activities would be highly visible across middleground portions of the analysis area or across portions of use areas, residences, and travelways.	
	Small	Highly visible project components or activities would be limited to foreground portions of the analysis area and to a limited number of use areas, residences, or travelways.	
	Likelihood		
	All visual effects are considered probable because they would be caused by specific components of the project.		



Proposed Dry Fork Station Photo Simulation
(Source: Basin Electric 2006a)

Figure 4.10-3 – Proposed Dry Fork Station Photo Simulation

Vertical components would be visible in middleground and background views. The tallest structures and activities and their heights are:

- One exhaust stack (500 feet);
- One pulverized coal boiler building (220 feet); and
- Three coal-storage silos (210 feet).

In viewing the proposed action from middleground locations, the form, lines, colors, and textures of these vertical structures would remain discernible to the viewer, and silhouetted structures would stand out vividly against the sky as shown in Figure 4.10-4, a viewshed analysis for the proposed action. The proposed action would be visible, along with other human modifications and facilities, in the area. However, the proposed action would continue to be a dominant feature and would attract attention depending on the location of the viewer. These effects are medium in extent.

In the background (beyond four miles), the exhaust stack would be visible to viewers in north Gillette, at the Gillette-Campbell County Airport, along portions of US 14/16, SH 59, Garner Lake Road, and I-90, and in most residential areas within the viewshed. Textures and colors would not be discernible at this distance; however, the vertical forms and lines of the exhaust stack, boiler, and silos would likely create a contrast against the forms and lines of the natural landscape of the undulating foothills. Some project components, such as the exhaust stack and lighting, may be visible beyond eight miles, depending on atmospheric conditions and viewing location. Long-term impacts from tall structures would be visible across large portions of the middleground and background distance zones of the analysis area. The magnitude of the impact would vary from moderate to minor, depending on viewer location.

The amount of visual contrast could be substantially affected by the facility lighting components. Lighting would be installed for construction activities (short term) and operational safety and security (long term) at the project site. Operational lighting, including night lighting, at the proposed site would be highly visible to viewers in the surrounding area. Long-term impacts would be visible across large portions of the foreground, middleground, and background distance zones of the analysis area. The magnitude of the impact would be from major to moderate, depending on viewer proximity.

The proposed ash landfill would create a permanent change in the visual character of the site. Although the change would be permanent, it would affect a relatively small area.

The conversion of rangeland to industrial uses on the project site would permanently change the visual character of the project area. Some viewers may find these visual changes objectionable. Proposed structures and activities would not blend in with the forms, lines, colors, and textures of surrounding landscape, which is mostly undeveloped, resulting in long-term changes to the visual landscape.

The proposed project would be in an area characterized as having VRM Class V scenic qualities. Given the number of similar-appearing facilities (silos, conveyor belts, disposal areas, and so forth), industrial lighting in the region, and long-term mining operations (site-clearing, dust,

truck traffic, and so forth), the degree of contrast that would otherwise result from the proposed action alone is diminished due to competing visual deviations. As a result, the proposed project would comply with VRM Class V objectives. Therefore the visual impacts are less than significant with respect to VRM class objectives.

4.10.3.2 *Alternative Site*

Construction

The impacts on visual resources from the construction of the alternative Dry Fork Station would be the same as the impacts on visual resources from the construction of the proposed power plant, a less than significant impact on visual quality.

Operation

The engineered components of the alternative action are visually similar to the proposed action. A viewshed analysis of the alternative action is shown in Figure 4.10-5. Impacts associated with the alternative action site are the same as those associated with the proposed site, except as noted below.

The facilities for the alternative site would be concentrated in the western portion of the site, set back approximately 2,500 feet from Garner Lake Road. Project components that lie horizontally relative to the ground plane would be highly visible in the foreground (and to a lesser extent, in the middleground) from Garner Lake Road for approximately one mile. Consequently, project components would be visible for half the distance compared to the proposed project, because project components for the proposed action would be highly visible in the foreground (and, to a lesser extent, in the middleground) from SH 59 for approximately two miles. Also, based on the viewshed analysis, the alternative Dry Fork Station site would have fewer areas from which tall structures could be seen than the proposed site.

4.10.4 **Transmission Line**

This section describes the impacts of the proposed Hughes Transmission Line project components and alternatives on visual resources. Figure 4.10-6 is a photo simulation of the proposed and alternative transmission line alignments along a common segment at KOP 4 (both lines would be in the identical location at this point). Figure 4.10-7 is a photo simulation of the proposed Hughes Transmission Line at KOP 15, and Figure 4.10-8 shows the alternative transmission line from the same point. Note that the alternative transmission line crosses the highway near the view point and would therefore be more visible from the highway at this location.

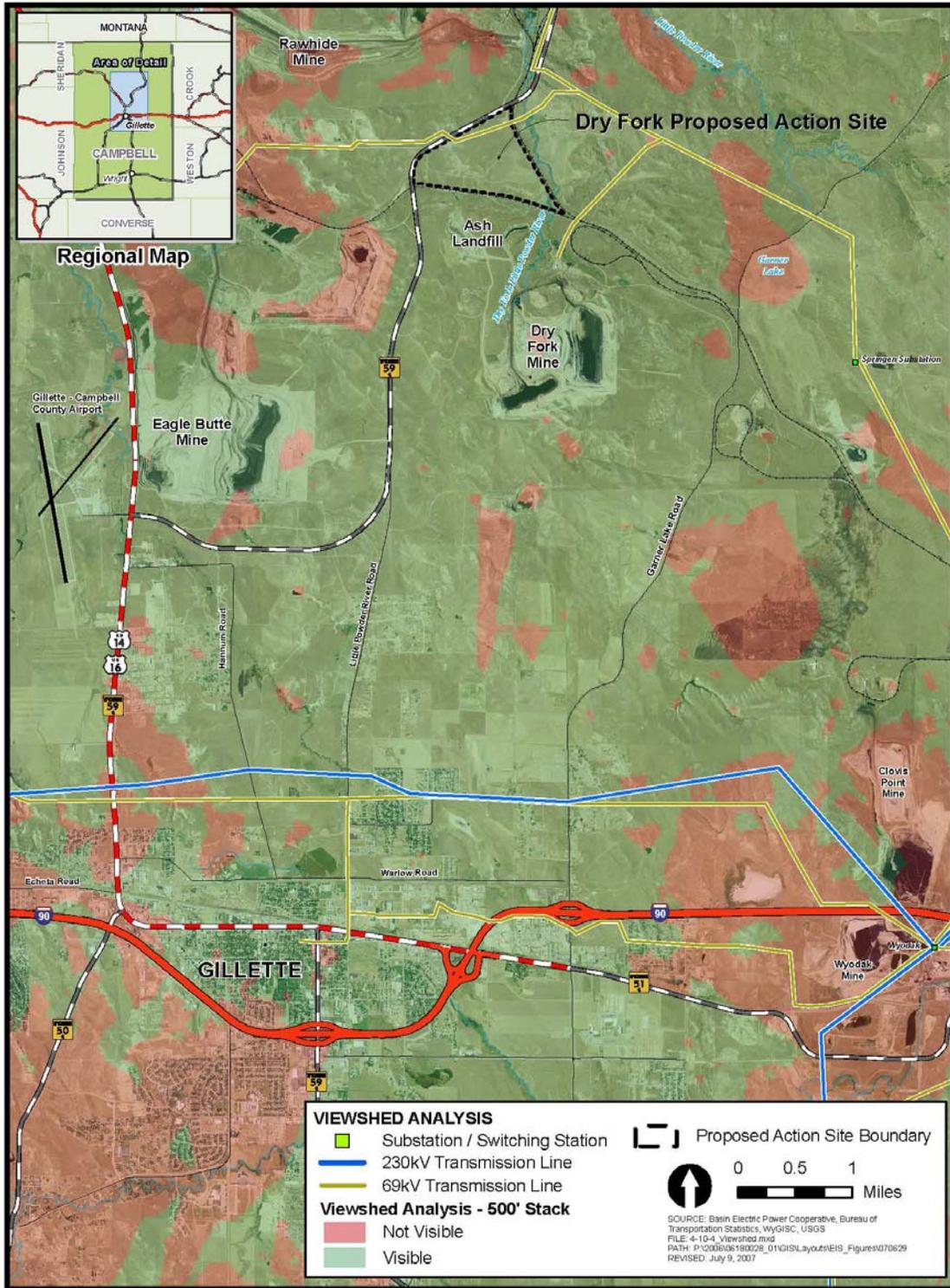


Figure 4.10-4 – Proposed Power Plant Viewshed Analysis

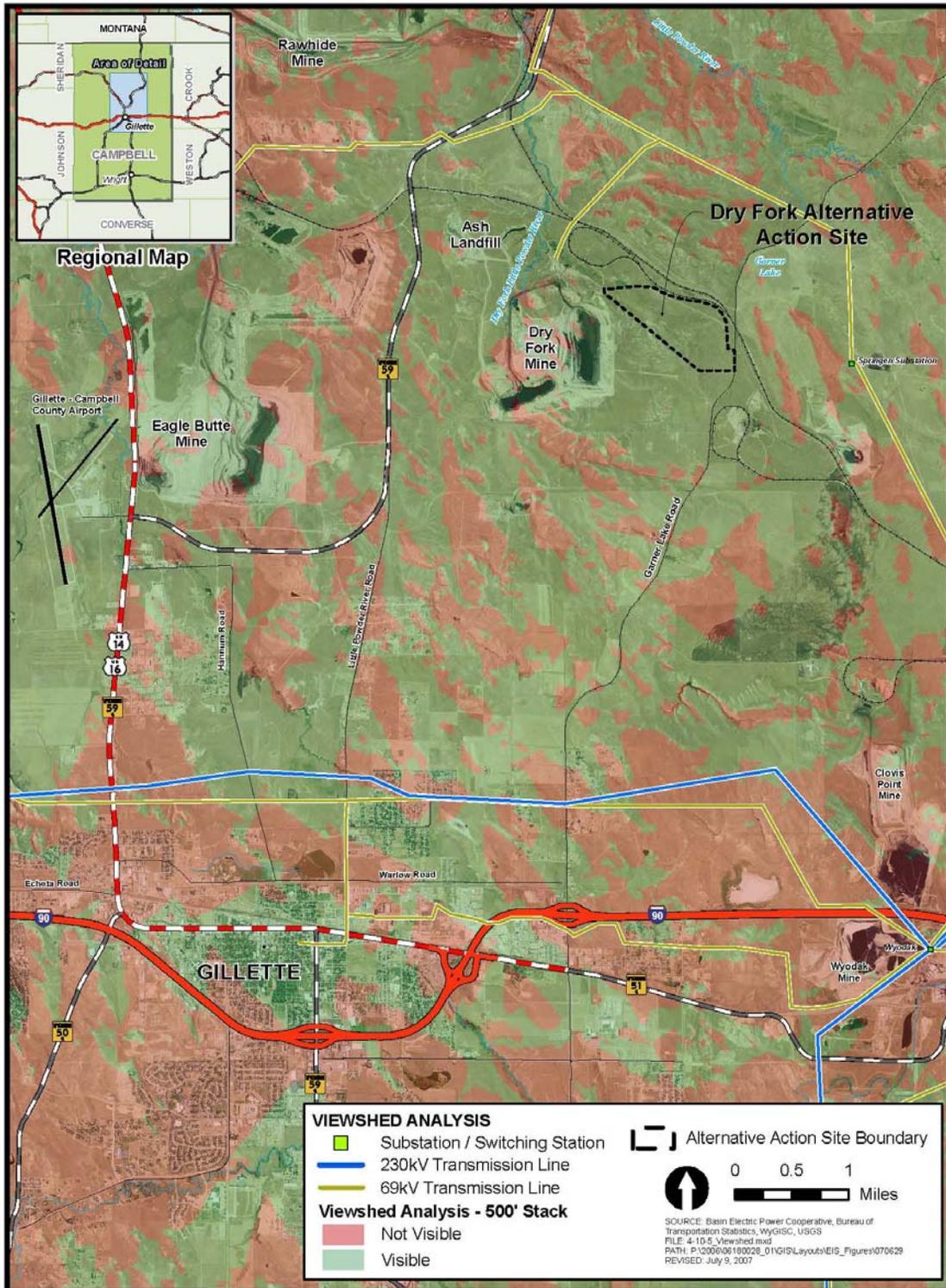


Figure 4.10-5 – Alternative Power Plant Viewshed Analysis

4.10.4.1 Proposed Alignment

Construction

Construction impacts on visual resources include the presence of equipment, materials, and associated dust, as well as at staging and lay-down areas along the routes. Additionally, construction would involve the alteration of landforms and vegetation in the ROW. Viewers would be able to see construction equipment and activities, mostly along areas adjacent to primary travelways (US 14, SH 59, and I-90) or near communities (Gillette, Sheridan, and unincorporated residential subdivisions). These activities would likely create contrasts of moderate to minor magnitude, and medium to large extent of short duration in the foreground-middleground distance zone, depending on the phase of construction and location of the viewer. Impacts from construction activities that change the landscape character would be temporary, and therefore, would be less than significant.

Areas where there are isolated occurrences of coniferous or riparian forest, trees more than 20 feet in height or taller within the project ROW may have vegetation trimmed or removed to provide sufficient clearance. Tree removal would be minimized. These long-term impacts would be minor and of small extent.

Operation

The proposed alignment would sometimes traverse within the vicinity of dispersed, occupied homes. In some instances, project components would be visible in the immediate foreground viewing distance. In these areas, residents may perceive the project as permanently degrading the scenic quality of the existing landscape. Within 500 feet of a 230-kV line, people can distinguish the details of transmission line components including the texture of the pole. Individual residents along the route could potentially experience direct, long-term, major adverse impacts where the transmission line creates a high degree of contrast. These impacts lessen as the distance between the viewer and the poles increase as a result of the ability of the landscape to absorb visual change as distance increases.

Direct effects on visual resources are more pronounced in areas with high volumes of viewers, such as along primary travelways. Potential adverse visual impacts would be expected in locations adjacent to US 14, SH 59, and I-90 due to the higher frequency of travelers in these areas. Locations where project components would be visible in the immediate foreground or where lines cross roadways are particularly important. The long-term impacts would be moderate to major for project structures next to travelways and would decrease in magnitude as distance between project structures and travelways increases.

Following construction and commissioning, maintenance would involve aerial and ground patrols for tree trimming and equipment repair. Viewers would be able to see ground inspections, including vehicles. Given the nature of the vegetation communities in the project area, long-term tree removal maintenance is anticipated to be minimal. Intermittent, annual maintenance activities would result in no change or a minor change to the visual environment.

BLM Land

A viewshed analysis was conducted along the length of the proposed and alternative alignments within a corridor extending four miles on either side of the reference centerline. Figures 4.10-9 and 4.10-10 show the results of the viewshed analysis for the proposed and alternative.

For comparison, Table 4.10-3 shows the impacts of the proposed transmission line and the alternative transmission line.

Table 4.10-3 – Impacts of Proposed and Alternative Transmission Line on Visual Quality

Impact	Proposed Action	Alternative Action	Basis
Number of Residences within 500 Feet of Transmission Line	3	14	Individual residents within the immediate foreground viewing distance along the route could potentially experience direct, long-term adverse impacts if the transmission line creates a high degree of contrast.
Number of Residences within 0.5 Mile (2,640 Feet) of Transmission Line	41	84	Individual residents may perceive the project as permanently degrading the scenic quality of the existing landscape.
Length within BLM VRM Class II Lands (miles)	0.3	1.2	The objective of this class is to retain the existing character of the landscape.
Length within BLM VRM Class III Lands (miles)	0	0	The objective of this class is to partially retain the existing character of the landscape.
Length within BLM VRM Class IV Lands (miles)	1.0	1.5	The objective of this class is to provide for management activities that require major modifications to the existing character of the landscape.
Length within BLM VRM Class V Lands (miles)	0	0	This class applies to areas where the natural character has been drastically altered and where the area requires rehabilitation to upgrade it to a higher classification.
Length within 1 mile of US 14	19.4	23.3	The public scoping process identified US 14 as a local scenic route, although it lacks a formal designation.
Length Adjacent to Existing Transmission Line (miles)	6	31	Coordinated ROWs constitute an incremental impact to a previously modified condition, rather than a new impact.

As shown in Table 4.10-3, there are three residences within 500 feet of the proposed transmission line alignment. The alteration of the visual landscape around these residences would be long term. The magnitude of the impact would vary depending on the presence of other human-made structures in the vicinity of the transmission lines.

Approximately 0.3 mile of the proposed transmission line alignment is on VRM Class II BLM lands. VRM Class II allows for less modification of the natural environment by human-made structures than VRM Class IV. Based on the distance of the transmission line to the nearest public viewpoints and the topography in the area, long-term impacts would not be significant. However, due to the fact that portions of the line would be located on VRM Class II lands, implementing BMP VR-M1 (see Table 2.4-2) is designed to reduce potential impacts on visual resources on VRM Class II BLM lands.



Proposed Transmission Line Photosimulation - KOP 4
(Source: Basin Electric 2006b)

Figure 4.10-6 – Proposed Transmission Line Photosimulation – KOP 4



Proposed Transmission Line Photosimulation – KOP 3
(Source: Basin Electric 2006b)

Figure 4.10-7 – Proposed Transmission Line Photosimulation – KOP 3



Alternative Transmission Line Photosimulation - KOP 3
(Source: Basin Electric 2006b)

Figure 4.10-8 – Alternative Transmission Line Photosimulation – KOP 3

Figure 4.10-9 – Proposed Transmission Line Viewshed Analysis

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Figure 4.10-10 – Alternative Transmission Line Viewshed Analysis

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4.10.4.2 *Alternative Alignment*

Construction

The impacts on visual resources from the construction of the alternative alignment would be the similar to the impacts on visual resources from the construction of the proposed alignment. Impacts would be less than significant.

Operation

The impacts on visual resources from the operation of the alternative transmission line would be the same as the impacts on visual resources from the operation of the proposed transmission line, except as noted below.

BLM Land

For comparison, Table 4.10-3 shows the impacts of the proposed transmission line and the alternative transmission line. As shown in the table, there are 14 residences within 500 feet of the alternative transmission line alignment. The alteration of the visual landscape around these residences would be long term. The magnitude of the impact would vary depending on the presence of other human-made structures in the vicinity of the transmission lines.

In addition, approximately 1.2 miles of the alternative alignment are on VRM Class II BLM lands. VRM Class II allows for less modification of the natural environment by human-made structures than VRM Class IV. Although the alternative alignment would be visible from the highway on land owned by BLM, the visual impact would be greatly reduced due to the presence of the linear railroad feature, the speed of vehicles on the highway, and the presence of curves and a bridge over the railroad tracks which demand driver attention. Based on the distance of the transmission line to the nearest public viewpoints and the topography in the area, long-term impacts would not be significant. However, due to the fact that portions of the line would be located on VRM Class II lands, implementing BMP VR-M1 (see Table 2.4-2) would reduce potential impacts on visual resources on VRM Class II BLM lands.

4.10.5 *Conclusions*

Both the proposed and alternative Dry Fork Station sites would result in short-term and long-term changes to the visual character of the project area. The primary impacts on visual resources involve lighting and skylining.

Although the proposed and alternative power plant sites would not be on BLM land, they would be in areas characterized as having VRM Class V scenic qualities, which are areas where the natural character has been drastically altered. The proposed and alternative power plants are located in areas where the natural character of the landscape has been substantially altered. The power plants would comply with BLM VRM objectives.

The high degree of visual contrast created by site lighting would be visible across major portions of the analysis area. BMP VR-M1 is designed to reduce impacts from lighting. Long-term impacts from the visibility of tall structures would also occur across large portions of the middleground and background distance zones of the analysis area. The magnitude of the impacts would vary, depending on viewer location.

Both the proposed and alternative transmission line alignments would result in short-term and long-term changes to the visual character of the project area. The primary impacts of the project include potential visual impacts to occupied homes and travelways. Table 4.10-3 summarizes the types of impacts from the alternatives.

4.11 TRANSPORTATION

For the purposes of this discussion, transportation resources include the transportation infrastructure and the patterns of usage (traffic).

4.11.1 Impact Criteria

Table 4.11-1 presents the detailed significance criteria used to evaluate transportation resources and define the significance thresholds.

4.11.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.11.3 Power Plant

4.11.3.1 Proposed Site

Construction

Impacts on transportation from construction of the proposed Dry Fork Station would be less than significant. Based on the significance criteria discussed in Section 4.11.1, impacts would be minor in magnitude, long-term, of small extent, and are highly likely.

Construction workers from Gillette and the surrounding area are expected to generate approximately 553 private vehicle trips to the site each day (CH2M Hill 2006a). In addition, approximately 10 bus trips are predicted to transport construction workers residing in the base camp and RV parking to the site (CH2M Hill 2006a). A traffic analysis prepared by CH2M Hill calculated the projected LOS assuming that all of these vehicles would arrive during the peak morning travel hours and depart during the peak afternoon travel hours (CH2M Hill 2006a).

Table 4.11-1 – Issues and Significance Criteria for Transportation and Traffic –Power Plant and Transmission Line

Power Plant and Transmission Line Issues Identified	Significance Threshold: The level of significance is associated with a decline in Level of Service (LOS) performance beyond the minimum threshold (LOS C).		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Traffic effects during the construction phase Increased accident risk from delivery trucks and construction crew's private vehicles and buses. 	Magnitude		
	Major	LOS decreased to E or below; noticeable increase in the number of serious traffic accidents (fatality /injury).	Projected changes in transportation and traffic based on site traffic impacts and associated LOS evaluations.
	Moderate	LOS decreased to D; increased traffic accidents involving injuries or property damage.	
	Minor	LOS at C or above; short-term level decrease to D for construction period; small increase in traffic accidents involving only property damage.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period up to 60 months.	
	Short-term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Key access routes to community are impacted at multiple intersections or road segments; deaths or serious injuries from traffic accidents.	Results of analysis of projected extent of impacts.
	Medium	Impact limited to project site and surrounding area; injuries or major property damage from traffic accidents.	
	Small	Impact limited to immediate project site; minor property damage from traffic accidents.	
	Likelihood		
	High	The impact would occur under typical operating conditions.	Results of analysis and construction and operational procedures and schedule.
	Medium	The impact would occur under worst-case operating conditions.	
Low	Little to no potential for the impact to occur.		

According to the results of the traffic analysis prepared by CH2M Hill for the Wyoming Department of Transportation (WYDOT), SH 59 and the access intersection are expected to operate at Level of Service (LOS) C or above, even during peak construction periods (CH2M Hill 2006a). Projected LOS changes are presented in Table 4.11-2.

Table 4.11-2 – Level of Service—Proposed Power Plant

Area	Construction		Operation	
	Without Project	With Project	Without Project	With Project
SH 59	B(B)*	C(C)	B(B)	C(C)
Access Roads	N/A	A(B)	N/A	A(A)

Source: CH2M Hill 2006

*#(##) = morning LOS (afternoon LOS)

N/A – not applicable (i.e., intersection does not exist without development of the site)

The number of vehicles expected to leave the site within the same peak hour suggests vehicle queues may form and potentially impact onsite operations. The sufficiency of planned access throat widths and onsite circulation should be evaluated during final design (CH2M Hill 2006a).

The majority of construction materials and equipment would be delivered to the site via the existing Burlington Northern Santa Fe (BNSF) rail spur during the entire construction period. A new rail siding would be constructed along the existing spur so construction materials could be unloaded at the site. No data or projections regarding increased rail usage were available. Approximately 500 truck trips would also be necessary during the 45-month construction period (CH2M Hill 2006a).

Although traffic volumes for roads in the project area vary widely, the accident history shown in Table 3.11-2 for these roadways reveals a very low accident rate between 2003 and 2005, with only 8 accidents during the 3-year period for SH 59 between mileposts 118.5 and 124.5, and even fewer on Garner Lake Road (6) and Little Powder River Road (4). The expected increase in private vehicle trips will be disbursed among several roadways leading to the project site access, reducing the impact on any one roadway. Short- and medium-term impacts to the local traffic network would be less than significant.

As noted above, most construction materials will be delivered by rail, along with an average of about 11 truck deliveries per day during the 45-month construction period. The medium-term impact from increased truck traffic on SH 59 during construction could lead to a potential increase in the number of traffic accidents on this section of highway. However, due to the small average number of deliveries, the possible increased risk would be less than significant. The potential for accidents could be reduced by posting signs warning motorists of increased truck traffic, especially near affected intersections. The planned improvements by the State Transportation Improvement Program (see Section 3.11.1) would also further alleviate accident risk and impacts to local traffic.

Operation

Operation of the proposed power plant would have a less than significant impact on transportation resources, local traffic, and traffic accident risk, according to the significance criteria discussed in Section 4.11.1. During operation, approximately 150 trips would be added to SH 59 daily. Seventy-five trips would occur in the morning peak travel hours and 75 trips would occur during the afternoon peak travel hours. See Table 4.11-2 for the expected LOS impacts during operation.

4.11.3.2 *Alternative Site*

Construction

Construction of the alternative power plant would have less than significant impacts on transportation resources, local traffic, and traffic accident risk. Based on the significance criteria discussed in Section 4.11.1, impacts would be minor in magnitude, short-term in duration, and small in extent, but would have a high likelihood of occurrence. All traffic is anticipated to access the alternative power plant site from the south via Garner Lake Road. During peak

construction, this would effectively add approximately 563 trips (553 private vehicle trips and 10 bus trips) in the morning and afternoon peak hours to Garner Lake Road (CH2M Hill 2006a). Approximately 500 truck trips would also be necessary during the 45-month construction period (CH2M Hill 2006a). No specific plans regarding acceleration/deceleration lanes have been proposed for the alternative power plant site.

According to the results of a traffic analysis prepared by CH2M Hill for WYDOT, Garner Lake Road is expected to operate at LOS C or above, even during peak construction periods (CH2M Hill 2006a). Projected LOS changes are presented in Table 4.11-3.

The number of vehicles expected to leave the site within the same peak hour suggests vehicle queues may form and potentially impact onsite traffic operations. The sufficiency of planned access throat widths and onsite circulation should be evaluated during final design (CH2M Hill 2006a).

Table 4.11-3 – Level of Service—Alternative Power Plant

Area	Construction		Operation	
	Without Project	With Project	Without Project	With Project
Garner Lake Road	B(B)	C(C)	B(B)	B(B)

Source: CH2M Hill 2006
Notes: morning (afternoon)

Operation

Operation of the alternative power plant would have a less than significant impact on transportation resources, local traffic, and accident risk, according to the significance criteria discussed in Section 4.11.1. During operation, approximately 150 trips would be added to Garner Lake Road daily. Seventy-five trips would occur in the morning peak travel hours and 75 trips would occur during the afternoon peak travel hours. See Table 4.11-3 for the impacts to LOS during operation.

During operations, fuel (coal) would be transported to the site directly from the Dry Fork Mine via conveyor belt rather than by rail, although, in an emergency, coal could be delivered by truck or rail (Basin Electric 2006aa).

4.11.4 Transmission Line

4.11.4.1 Proposed Alignment

The proposed or alternative alignment would have no impact on transportation.

Construction

During construction, minor, short-term increases in traffic would occur as contractors drive along area roads, especially roads used to access the transmission line ROW, to complete the activities necessary to construct the line. The transmission line project is expected to utilize approximately 100 workers at peak construction (Basin Electric 2006b), so traffic increases would be minor. Temporary detours and/or traffic delays could be associated with stringing the transmission line where the line crosses roads. Construction of the transmission line would have no impact on

transportation resources based on the significance criteria discussed in Section 4.11.1. The increase is considered minor and could not reasonably be expected to cause the LOS on any portion of the transportation system to fall below the minimum threshold.

Access Roads

Construction crews and equipment would access the ROW via a convenient access road. No new access roads are expected to be built. At least eighteen existing roads, listed in Section 3.10.1, have been identified to provide access to the ROW. Passenger and truck traffic on access roads is expected to increase only slightly during construction. This impact is considered short-term and of minor magnitude. Once crews and equipment access the ROW, they would travel along the ROW as much as possible to minimize trips on access roads (Basin Electric 2006b).

Road Quality

Impacts on road quality are expected to be minor and medium-term. There is a medium likelihood that trucks and other heavy equipment would degrade the quality of unpaved county roads. Should major road damage be directly caused by a construction contractor, the construction contractor would be responsible for restoring roads to their original condition upon completion of the project (Basin Electric 2006b).

Rail

If possible, construction materials and equipment would be delivered to staging areas via rail (Basin Electric 2006b). Other materials would be delivered to site staging areas and to the ROW by truck. No data or projections regarding increased rail usage were available.

Operation

During the 60-year life of the project, Basin Electric maintenance crews would periodically inspect, maintain, and repair the transmission line. Aerial and ground inspections are routinely performed to detect repairs needed after inclement weather. Truck traffic during operations and maintenance is anticipated to be negligible (Basin Electric 2006b). Operation of the Hughes Transmission Line would have a less than significant impact on transportation resources according to the significance criteria discussed in Section 4.11.1.

4.11.4.2 *Alternative Alignment*

Construction

Impacts during construction with respect to traffic/LOS, access roads, road quality, road crossings, airports, and rail are expected to be similar to those described for the proposed transmission line. Construction of the alternative corridor would have a less than significant impact on transportation resources according to the significance criteria discussed in Section 4.11.1.

Operation

Impacts during operation with respect to traffic/LOS, access roads, road quality, road crossings, airports, and rail are expected to be similar to those described for the proposed transmission line. Operation of the alternative transmission line would have a less than significant impact on transportation resources according to the significance criteria discussed in Section 4.11.1.

4.11.5 Conclusions

The proposed and alternative power plant, and the proposed and alternative transmission line, would have a less than significant impact on transportation resources according to the significance criteria discussed in Section 4.11.1. Even during peak construction periods, increases in traffic levels would not be expected to cause the LOS on any portion of the public transportation system to fall below the minimum threshold (LOS C) (Basin Electric 2006b).

4.12 CULTURAL RESOURCES

4.12.1 Impact Criteria

Impact analysis for cultural resources incorporates the National Historic Preservation Act (NHPA), Section 106 process. The Section 106 process requires federal agencies to take into account the effects of their actions or actions that they permit, license, or approve on any district, site, object, building, or structure included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The federal agency, in consultation with the State Historic Preservation Office (SHPO), applies the National Register criteria to assess the eligibility of identified properties and determines the nature of the effect.

Implementing regulations for the Section 106 process are contained in 36 CFR Part 800, Protection of Historic Properties, as amended in 2004. These regulations provide specific criteria for identifying effects on historic properties. Effects to cultural resources listed in or eligible for listing in, the NRHP are evaluated using the Criteria of Adverse Effects.

“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.” (36 CFR 800.5(a) (1))

Types of adverse effects include:

- Physical destruction of or damage to all or part of a property;
- Physical alteration of a property;
- Removal of a property from its historic location;
- Change of the character of a property’s use or of physical features within a property’s setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of a property’s significant historic features;
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance;

and

- Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of a property's historic significance (36 CFR 800.5(a)(2)).

A significant impact would result if the action causes an adverse effect that cannot be resolved through consultation or mitigation on NRHP-eligible resources or areas of importance to Native American or other traditional communities.

In the Section 106 process, the federal lead agency determines an Area of Potential Effect (APE) for each undertaking or project. The APE is defined as the geographic area or areas within which an undertaking or project may cause changes in the character or use of historic properties, if such properties exist. For this project the direct APE would be areas that could be directly disturbed by the project construction and the indirect APE would include the area potentially affected by visual, atmospheric, or audible elements of the project.

The status of cultural resource inventories, consultations and eligibility determinations is described in detail in Section 3.12. Inventories range from 100 percent Class III intensive field surveys with SHPO concurrence on eligibility to areas where literature review indicates that no previous work has been conducted. If necessary, cultural resource surveys would be completed for all areas proposed for disturbance prior to construction and a Class III cultural resources report will be prepared and sent to the Wyoming SHPO for review and concurrence. Additional cultural resources are likely to be present and some may meet the NRHP eligibility criteria. Evaluation of eligibility may require further field work, such as test excavations or additional archival research. Project effects on setting of cultural resources in the indirect APE would also need to be evaluated if the setting is relevant to the significance of the property.

Identified cultural resource types to date are primarily prehistoric and historic archaeological sites which can often be physically avoided during project design. No cultural resources have been identified to date that would likely be impacted due to changes in setting.

During construction or brush clearing unrecorded cultural resources or human remains may be discovered. Workers would be instructed to stop work in the vicinity of the discovery so that these resources would be protected, evaluated, and treated in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA) and Section 106 of the NHPA. Fencing would be used to avoid any further impacts from construction and transmission line structure locations would be adjusted along the ROW, if necessary to avoid or minimize impacts.

Consultation with Native American tribes on the presence or absence of traditional cultural properties, sacred sites, or other culturally significant areas has been initiated and is ongoing. To date, no sites or locations of concern to Native American tribes have been identified. This does not preclude the possibility that these resources may be present. In some situations specific information about sensitive areas is withheld until disclosure is necessary or project areas are better defined.

4.12.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.12.3 Power Plant

4.12.3.1 Proposed Site

Construction

The proposed Dry Fork Station and ash landfill would be sited on a reclaimed mine area. Class III surveys have been conducted for the APE of the proposed power plant and ash landfill site. Four previously recorded sites within the ash landfill site were recently rerecorded and were recommended as ineligible for listing on the NRHP with the concurrence of the Wyoming SHPO (O'Dell 2007). The construction of the proposed power plant is not expected to have any direct impacts on NRHP-eligible or -listed historic properties within the direct APE. The presence of any Native American traditional cultural properties, sacred sites, or other culturally significant areas within the direct APE is unknown, but not anticipated due to past disturbance of the project area. No impacts are anticipated. No offsite cultural or Native American resources have been identified to date that would be impacted by alterations to the visual, atmospheric, or audible setting.

Acceleration and deceleration lanes would be constructed within the existing right-of-way ROW of SH 59 for site access. There is a very low probability of discovering any intact cultural resources within the ROW due to past disturbances.

It is possible for subsurface, undiscovered archaeological sites to be present and to be revealed during construction. Physical damage or destruction of the site or resource could occur especially from the use of heavy equipment. Because of past disturbance, resources are not anticipated at the proposed Dry Fork Station site, ash landfill and along SH 59. Implementation of BMP CR-M2 and CR-M3 would reduce the likelihood of significant impacts on cultural resources resulting if unanticipated discoveries occur.

Operation

The proposed power plant would operate 24 hours per day, 7 days per week. Operations would be associated with changes in visual, atmospheric, or audible setting. No onsite or offsite cultural or Native American resources have been identified to date that would be impacted by alterations to the visual, atmospheric, or audible setting.

4.12.3.2 Alternative Site

Construction/Operation

All operational and design aspects for the alternative Dry Fork Station site would be the same as for the proposed action, including implementation of BMPs. The ash landfill described for the

proposed action would also be used for the alternative power plant site. The potential for impacts on cultural resources from construction and operation of the alternative power plant, ash landfill and access would be the similar or the same as those described for the proposed power plant.

Site access would change to Garner Lake Road which would require improvements. The potential for intact cultural resources that may be impacted due to construction along Garner Lake Road has not been investigated, but may be low due to past disturbance.

The alternative site would be on open land that has not been surveyed for cultural resources. Because the alternative site is not a reclaimed mine area, there is a greater likelihood of intact cultural resources being present at this location. If the alternative site is chosen, a Class III survey would be conducted prior to construction and the Section 106 process would be completed in consultation with the Wyoming SHPO. Impacts are unknown. Adverse effects to cultural resources are possible, but BMPs and mitigation measures such as avoidance or data recovery of archaeological sites would reduce the likelihood of significant impacts.

4.12.4 Transmission Line

4.12.4.1 Proposed Alignment

Construction/Operation

The file search indicates that approximately 20 percent (128,880 feet) of the proposed transmission line alignment's direct APE has been surveyed to current standards. A total of 55 previously recorded sites lie within or immediately adjacent to the proposed alignment. These include four eligible properties, 36 ineligible properties, and 15 unevaluated sites. The four eligible properties are a prehistoric habitation site (48CA1617), two stone ring sites (48CA89 and 48CA3973), and the historic CB&Q Railroad grade (48CA265).

As the transmission line alignment is finalized, the portions of the alignment in the direct APE that have not been previously surveyed would need a Class III inventory. All cultural resources located during the Class III survey would need to be recorded per Wyoming SHPO requirements. All previously recorded sites within the direct APE would need to be rechecked and have updated site forms filed. Project effects on setting of cultural resources in the indirect APE would also need to be evaluated if the setting is relevant to the significance of the property.

Anticipated prehistoric resources in unsurveyed areas would include lithic scatters, lithic procurement locales/quarries, habitation sites, and stone rings/circle locales. Anticipated historic-era resources would include historic debris and trash deposits, stockherding camps, homesteads, cairns, structures, and mining resources. Consultation with Native American tribes is ongoing, but to date, no sites or locations of concern to Native American tribes have been identified.

Overhead transmission lines would not typically cause an adverse effect on prehistoric and historic archaeological sites eligible for listing on the NRHP for their information potential, provided that no surface disturbance occurs within the site boundaries or construction does not lead to future disturbance. The use of a wide corridor and implementation of BMPs would allow avoidance of most archaeological sites and should reduce the likelihood of significant impacts. If

sites cannot be avoided, data recovery excavations may be necessary as mitigation. Overhead transmission lines can however, alter the visual setting of historic structures, landscape and some Native American resources in the indirect APE if setting is relevant to the significance of the property. No properties have been identified as being impacted to date, but only the portions of the indirect APE where transmission lines would cross BLM-administered parcels have been assessed (ACR 2006, ACR 2007).

The potential for impacts on unidentified subsurface resources would be the same as those identified for the proposed Dry Fork Station. Implementation of BMPs should reduce the likelihood of significant impacts.

4.12.4.2 *Alternative Alignment*

Construction/Operation

The file search indicates that approximately 12 percent of the alternative alignment's direct APE has been surveyed to current standards. A total of 44 previously recorded sites lie within or immediately adjacent to the alternate route. These include nine eligible properties, 30 ineligible properties, and five unevaluated sites. The eligible properties are three prehistoric habitation sites (48CA1166, 48CA1617, and 48CA1860), a stone ring site (48CA3973), two historic homesteads (48CA2052 and 48CA2053), a historic irrigation ditch (48SH881), the historic North-South Railroad (48SH1093), and the historic CB&Q Railroad grade (48SH258). The CB&Q Railroad is a linear resource that traverses multiple Wyoming counties and has different site numbers by county (ACR 2006).

As the alternative transmission line alignment is finalized, the portions of the alignment in the direct APE that have not been previously surveyed would need a Class III inventory. All cultural resources located during the Class III survey would need to be recorded per Wyoming SHPO requirements. Project effects on setting of cultural resources in the indirect APE would also need to be evaluated if the setting is relevant to the significance of the property.

Anticipated resources and potential impacts on cultural resources from construction and operation of the alternative alignment would be the same as those identified for the proposed transmission line.

4.12.5 *Conclusions*

No impacts to cultural resources are anticipated in the direct APE for the proposed Dry Fork Station and ash landfill due to past disturbance of the project area. Class III surveys have been completed and the SHPO has concurred with eligibility determinations. The direct APE for the alternative power plant site has not been surveyed. It is assumed that any resources found would be similar to those found regionally. If this site is chosen, Class III inventories would be conducted and the Section 106 process would be completed in consultation with the SHPO. Any adverse effects would be resolved, primarily through avoidance of archaeological sites and implementation of BMPs and the likelihood of significant impacts would be reduced.

Minor modification of roads including the addition of acceleration and deceleration lanes would be constructed within the existing rights-of-way. There is a low probability of discovering any intact cultural resources within the ROW due to past disturbances.

No anticipated adverse effects to cultural resources have been identified for the proposed and alternative transmission line alignments. Only a small portion of the direct APE of these alignments has been surveyed. As the transmission line alignment is finalized, the portions of the alignment in the direct APE that have not been previously surveyed would need a Class III inventory. All cultural resources located during the Class III survey would need to be recorded per Wyoming SHPO requirements. All previously recorded sites within the direct APE would need to be rechecked and have updated site forms filed. Overhead transmission lines would not typically cause an adverse effect on prehistoric and historic archaeological sites eligible for listing on the NRHP for their information potential, provided that no surface disturbance occurs within the site boundaries or construction does not lead to future disturbance. Avoidance should be possible for most archaeological resources.

Project effects of the power plant and transmission line on setting of cultural resources in the indirect APE would need to be evaluated if the setting is relevant to the significance of the cultural resources such as historic structures, landscape, and some Native American resources. No properties have been identified as being impacted to date, but only the portions of the indirect APE have been assessed.

Consultation with Native American tribes on the presence or absence of traditional cultural properties, sacred sites, or other culturally significant areas has been initiated and is ongoing. To date, no sites or locations of concern Native American tribes have been identified.

Under the No Action Alternative there would be no potential for impacts on cultural resources related to the construction and operation of the Dry Fork Station, but potential impacts associated with the transmission line would still be possible. The potential for significant impacts would be reduced through BMPs and compliance with NEPA and the Section 106 process.

4.12.6 Mitigation

No adverse effects to cultural resources have been identified to date. It is anticipated that incorporation of BMPs described in Chapter 2, ongoing consultation with Native American tribes and successful completion of the Section 106 process would reduce the likelihood any significant impacts to cultural resources.

Additional measures to avoid adverse effect would include:

- No surface disturbances should occur within the site boundaries or within a 100-foot buffer of identified NRHP-eligible, NRHP-listed, or unevaluated historic properties;
- Continue to engage with Native American tribes to determine the presence of Native American resources within the direct or indirect APE of the selected project components; and
- Consider an analysis of impacts in the indirect APE, as part of the site and alignment selection process including an assessment of possible impacts on any previously recorded NRHP-eligible, - listed, or unevaluated sites within the visually and audibly affected area.

Some adverse effects such as physical damage, changes to visual, atmospheric, or audible setting, resulting from the construction and operation of the power plant or transmission line may not be avoided. Prior to initiation of construction, Basin Electric would consult with the SHPO to develop measures to avoid, minimize, or mitigate the adverse effects to these resources. While the adverse effects to the resources would remain, mitigation measures would resolve these effects and reduce impacts to a less than significant level.

The following measures to avoid, minimize, or mitigate adverse effects could be considered:

- Conducting data recovery excavations of archaeological sites that cannot be avoided;
- Conducting in-depth background research of historical resources;
- Implementing the BMPs during construction; and
- Training construction, maintenance, and operations personnel to recognize when archaeological resources or human remains have been discovered or when inadvertent damage has occurred to a resource, to halt ground disturbing activities in the vicinity of the discovery, and to notify appropriate personnel.

4.13 PALEONTOLOGICAL RESOURCES

4.13.1 Impact Criteria

There are no standard criteria for determining the level of impact on paleontological resources. Given the lack of paleontological sites within the geological setting of the area, the likelihood of the presence of such resources within the project area is considered minimal. However, BMPs PR-M1, PR-M2, and PR-M3 (see Table 2.4-1) are included to minimize impacts to the extent possible should these resources be discovered. Generally, if an action disturbs or destroys a paleontological site in any manner, it would be considered a significant impact. All impacts would be considered localized and long-term impacts, as paleontological resources, especially identifiable vertebrate fossils, are considered finite, nonrenewable resources.

4.13.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.13.3 Power Plant

4.13.3.1 Proposed Site

Construction

It is unlikely that any paleontological resources would be encountered. However, if paleontological resources (especially identifiable vertebrate fossils) were to be uncovered, this would be considered as a significant discovery. In this case, work would be halted and the necessary consultations would occur.

Operation

No impacts on paleontological resources would occur as a result of operation of the proposed power plant, because if such resources were present at the project site, any impacts and mitigation measures would have occurred during the construction phase.

4.13.3.2 Alternative Site

Construction/Operation

The discussion above for the Proposed Power Plant applies for the Alternative Power Plant.

4.13.4 Transmission Line

Construction/Operation

The discussion above for the construction and operation of the proposed and alternative power plant sites applies to the proposed and alternative transmission lines.

4.13.5 Conclusions

While, no impacts on paleontological resources are expected as a result of construction and operation of the power plant and the transmission line, the likelihood of unknown paleontological resources exists, creating the possibility of significant impacts. BMPs PR-M1, PR-M2, and PR-M3 are in place to manage work and minimize impacts should paleontological resources be encountered.

4.14 SOLID WASTE AND HAZARDOUS MATERIALS

Information used to evaluate the potential impacts of hazardous materials and solid waste generated during construction and operation of the proposed Dry Fork Station and Hughes Transmission Line were provided in a variety of recent studies and reports (Basin 2006a, 2006b). The data discussed in this section are being supplemented by Basin Electric with ongoing investigations and facilities design work. The following information will be generated from these efforts:

- Detailed facility designs and operation plans, including plan and section of each potential discharging facility; engineering controls on potential discharge (e.g., impoundment liners, subsurface drains, drainage structures to segregate impacted and non-impacted storm water, and mechanical systems for water removal); and facility operations plans;
- Preliminary design of facilities, including an ash landfill; and
- Characterization of coal combustion byproducts.

The Dry Fork Station is being designed as a “zero” discharge facility. The rate of process wastewater generated (134 gpm) will equal the expected reuse of this water for air emissions controls (119 gpm) and dust control at the ash landfill (15 gpm). Details on plant design are provided in Chapter 2, and information on the quality of the process wastewater is provided in Section 4.4.

Scenarios for generation of leachate from the ash landfill were evaluated based on site design characteristics and leachate discharge calculations. Estimates of leachate discharge combined with measurements of predicted leachate chemistry were compared to ambient groundwater quality conditions to assess the significance of potential impacts. This is further discussed in Section 4.4.

Estimated chemical characterization and quantities of the coal combustion by-products (CCB) were developed from characterization of CCB material stored at other Basin Electric disposal facilities and analysis of the ash content of the coal to be combusted.

4.14.1 Impact Criteria

The significance criteria for solid waste and hazardous materials, described below, are used to evaluate the degree of potential impacts for this project. Table 4.14-1 summarizes these criteria.

4.14.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.14.3 Power Plant

4.14.3.1 Proposed Site

Construction

Construction activities could create the potential for a hazardous materials spill or could require disposal of hazardous materials. Potentially hazardous construction materials include adhesives, fuels, lubricants, paints, and sealants. Spills that could occur during construction include fuel or oil spills during maintenance of equipment at the site. Representative hazardous or potentially hazardous chemicals that may be stored and used during the construction phase of the proposed action are: acids for equipment cleaning, concrete curing compounds, air tool oil, canned spray paint, paint thinner and other solvents, diesel deicer, antifreeze, mastic coatings, petroleum products (gasoline, diesel fuel, lubricants, brake fluids, and hydraulic fluids), and ammonium hydroxide.

Conformance with Occupational Health and Safety Administration (OSHA) and EPA standards and guidelines for handling and cleanup of hazardous materials would reduce the magnitude, extent, and likelihood of potential impacts from hazardous materials during the construction to minor, small and low, respectively. The duration of the potential impacts is short-term (42 months).

Table 4.14-1 – Issues and Significance Criteria for Solid Waste and Hazardous Materials – Power Plant and Transmission Line

Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if the potential exists for actions to result in uncontrolled discharges of hazardous materials or solid waste to the environment. An effect would be considered significant if a potential violation of a federal law or regulation would occur as the result of discharges from the solid waste landfill and/or facilities related to the storage, handling, and transport of hazardous waste.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Hazardous materials and waste management Environmental contamination 	Magnitude		
	Major	Surface water, groundwater, soil, and air contamination due to discharges from the ash landfill or discharges of hazardous materials in exceedance of federal or state standards.	Results of air and water quality predictive analyses.
	Moderate	Water, soil, and air quality impacts are below state and federal standards or guidelines.	
	Minor	Minimal to no air, soil, or water quality impacts.	
	Duration		
	Long-term	Duration of the project (60 years).	Project construction and operation schedule.
	Medium-term	Impact duration greater than construction period (42 months).	
	Short-term	Short period during construction or startup lasting 42 months or less.	
	Extent		
	Large	Impact is to a large area/watershed.	Results of air and water quality predictive analyses.
	Medium	Impact is limited to the EIS Study Area.	
	Small	Impact is limited to immediate project site.	
	Likelihood		
	High	The impact will occur based on modeling results.	Results of soil, air, and water quality predictive analyses and construction and operation procedures and schedule.
	Medium	Moderate potential for the impact to occur.	
Low	Little or no potential for the impact to occur.		

Non-hazardous industrial waste generated during construction would be disposed of at the Campbell County North Landfill – Site 2, a permitted industrial waste cell located near the Dry Fork Mine. Municipal solid waste generated during construction would be disposed of at Campbell County’s landfill that is permitted for this waste stream.

Operation

Various hazardous and potentially hazardous chemicals/materials would be used during power plant operation and maintenance. Representative hazardous and potentially hazardous chemicals/materials that may be used during operation and maintenance of the Dry Fork Station are: anhydrous ammonia and other ammonia products, various acids and bases, No. 2 diesel fuel, trisodium/disodium phosphate, chelating agents, various cleaning chemicals and laboratory reagents, lubricating oils, and compressed gasses.

The facility would likely be considered a small quantity generator of hazardous waste (generating between 220 and 2,200 pounds per month). As such, the facility would require an

EPA identification number for monitoring and tracking hazardous material activities. EPA regulations govern the transport, use, storage, and disposal of hazardous or potentially hazardous materials. Because conformance with these regulations would be mandatory, impacts from hazardous materials usage during plant operations would be less than significant. See the BMPs listed in Table 2.4-2 for a more detailed description of specific requirements.

Ash, fly ash, and dry scrubber byproducts would be generated and disposed of in the ash landfill, proposed to be located immediately south of the power plant site (see Figures 1.1-3 and 2.2-4). An industrial landfill permit would be obtained from the WDEQ Solid Waste Division.

In order to evaluate potential impacts to the environment from leachate generation at the ash landfill, including measures to protect against seepage to groundwater, the Hydrologic Evaluation of Landfill Performance (HELP) model was used (Basin Electric 2006a). The HELP model was used to evaluate both a covered and uncovered landfill. The results predicted by the model under both scenarios indicate that no precipitation water would pass through the landfill under either scenario.

Given the results of the HELP modeling, the routine water quality monitoring, and the run-on and runoff control structures, potential groundwater impacts from landfill operations would be less than significant. The magnitude would be minor and there would be a low likelihood of occurrence. Likewise, the runoff controls and the landfill cover would prevent sediment from the landfill from entering surface water or wetlands in the vicinity.

4.14.3.2 *Alternative Site*

Construction

Potential hazardous materials and solid waste impacts associated with the construction of the Dry Fork Station at the nearby alternative site would be the same as those described for the proposed action.

Operation

Potential hazardous materials and solid waste impacts associated with the operation of the Dry Fork Station at the nearby alternative site would be the same as those described for the proposed action.

4.14.4 **Transmission Line**

4.14.4.1 *Proposed Alignment*

Construction

Hazardous materials may be transported along roads in the project area during construction. The most likely occurrence of a spill would be during transportation and use of hazardous materials to and from the work areas. Proper storage, use, and management of these materials would help ensure that no releases into the environment occur. If any hazardous materials are spilled, proper spill response and cleanup procedures would be followed to ensure that contamination does not reach waterways (see BMP HM-M2 in Table 2.4-2). The likelihood of significant spills

occurring is low due to the small volume of hazardous materials likely to be used and the short duration of the construction period.

The laws that govern the use, storage, and disposal of hazardous materials and solid waste for the proposed transmission line would be the same as those described for the proposed power plant. Conformance to EPA standards and guidelines would reduce the likelihood of significant impacts from hazardous materials during the construction phase of the proposed transmission line to low.

The magnitude of hazardous waste generation from constructing the transmission line is expected to be minor. Possible solid waste streams from roll-off bins at staging areas could include unusable pieces of lumber from structure erection, short pieces of conductor wire, guy wires, insulating materials, and used aerosol cans. The extent would be small, limited to the immediate project site.

Overall impacts from solid waste and hazardous materials during construction would be less than significant. While the duration would be short-term as defined in Section 4.14.1, the magnitude would be minor, extent would be small, and likelihood of impacts would be low.

Operation

Operation and maintenance of the proposed Hughes Transmission Line would not result in the generation of significant quantities of solid or hazardous waste. Minor quantities of hazardous materials may be used during maintenance of the line; therefore, the likelihood of a large spill is low. Operation of the transmission line would have less than significant impacts based on the criteria in Section 4.14.1. Impacts from solid waste and hazardous materials would be minor in magnitude, small in extent, and have a low likelihood of occurrence.

4.14.4.2 *Alternative Alignment*

Construction

Potential impacts associated with the construction of the alternative corridor would be the same as those described for the proposed action.

Operation

Potential impacts associated with the operation of the alternative alignment would be similar to those described for the proposed corridor. Operation of the transmission line would have less than significant impacts based on the criteria in Section 4.14.1. Impacts from solid waste and hazardous materials would be minor in magnitude, small in extent, and have a low likelihood of occurrence.

4.14.5 **Conclusions**

All impacts regarding hazardous materials or solid waste would be less than significant from either the proposed power plant or the proposed Hughes Transmission Line. Construction-related impacts on waste management at the Dry Fork Station site and the alternative site would be comparable. Impacts would be of minor magnitude, medium-term duration, small extent, and

with a moderate potential for impact to occur. Construction-related impacts on waste management for the proposed Hughes Transmission Line corridors and the alternative corridors would also be comparable. Impacts would be of minor magnitude, short-term duration, small extent, and with a low potential for impact to occur.

Operation-related impacts on waste management at the Dry Fork Station site and the alternative site would be comparable to one another. Impacts would be of moderate magnitude, long-term duration, medium extent, and with a moderate potential for impact to occur. Operation-related impacts on waste management for the proposed Hughes Transmission Line corridors and the alternative corridors would also be comparable. If a spill were to occur, impacts would be of minor magnitude, short duration, small extent, and with a low potential for impact to occur.

4.15 PUBLIC HEALTH AND SAFETY

This section discusses the potential human health and environmental effects of the proposed project. The effects are based on potential impacts on water addressed in Section 4.4, impacts on air addressed in Section 4.5, impacts on human hearing related to noise exposure addressed in Section 4.6, impacts on traffic addressed in Section 4.11, impacts from hazardous waste and materials addressed in Section 4.14, and impacts on public services addressed in Section 4.16.

Table 4.15-1 summarizes the significance criteria used in the evaluation of potential impacts for public health and safety. An effect would be considered significant if it is associated with the violation of safety regulations that results in injuries and/or deaths, or that the number of safety violations exceeds established occupational health and safety standards.

4.15.1 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.15.2 Power Plant

4.15.2.1 Proposed Site

Construction

Potential impacts on public health and safety related to construction of the proposed Dry Fork Station could include occupational injuries or fatalities. This potential for impacts would be medium-term lasting for the duration of project construction, approximately 42 months.

The construction of a coal-burning power plant would involve direct health and safety issues for workers. The National Institute for Occupational Safety and Health (NIOSH) considers construction to be a high-risk industrial sector.

Operation

The potential impacts on human health and safety as a result of emissions of hazardous air pollutants from the facility are described in Section 4.5. During power plant operations, there would be no public access to the power plant and associated facilities.

Like many naturally occurring materials, coal contains traces of radioactive uranium and thorium at an average of about 1 part per million (ppm) and 3 ppm, respectively. By comparison, the average brick contains about 8 ppm uranium and 11 ppm of thorium (NCRP 1988). When coal burns, less than one percent of its radioactive contents are released into the atmosphere. The rest remains in the ash (USGS 2000). In regard to the small proportion of radioactive material that is released into the atmosphere, there are very little available data on the resulting exposure risk. EPA, however, cites a figure of 0.03 millirem/yr radiation exposure within 50 miles of a coal plant (EPA 2006). Given the overall average background exposure of 360 millirem/yr for the average person, this EPA figure would suggest that living near a coal plant is not likely to increase a person's radiation exposure by more than a very small amount.

In 1999, EPA conducted a risk assessment that found a lack of potential human health risk for virtually all CCB, with the exception of arsenic (EPA 1999). Arsenic in CCB was found to pose a potential human health risk via two possible pathways: 1) groundwater pathways where CCB are managed in unlined landfills and surface impoundments, and 2) non-groundwater pathways where CCB wastes are used as soil amendments for agricultural purposes. Based on the HELP modeling conducted for the proposed solid waste landfill, the potential risk of arsenic entering the groundwater is very low.

For the air permit application for the proposed Dry Fork Station, a human health risk assessment was conducted concerning cancer and non-cancer risks. See Section 4.5.8 and Appendix D-2 for details.

4.15.2.2 *Alternative Site*

Construction

The alternative site would have similar impacts as described above because activities would be similar.

Operation

Impacts from the operation of the power plant on human health and safety at the alternative power plant site would be similar to those discussed under the proposed Site.

4.15.3 **Transmission Line**

4.15.3.1 *Proposed Alignment*

Construction

The construction of the proposed alignment would expose workers to potential health and safety risks. All construction activities on the transmission line and associated substations would be considered routine, and the construction contractor would be responsible for implementing health and safety plans to minimize job-related injuries.

Table 4.15-1 – Issues and Significance Criteria for Public Health and Safety – Power Plant and Transmission Line

Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with the violation of safety regulations that results in injuries and/or deaths, or that the number of safety violations exceeds established occupational health and safety standards		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Noise, including corona effects Risk of accidents resulting in loss of life or injuries, and property damage or loss Exposure to electromagnetic fields (EMF) 	Magnitude		
	Major	Human Health and Safety - Catastrophic event resulting in loss of life, severe injuries requiring hospitalization, or major property damage or loss. Exposure to electric fields > 10 kilovolts per meter (kV/m) or magnetic fields > 100 milligauss (mG).	EMF: Results of electric and magnetic field modeling.
	Moderate	Human Health and Safety - Event resulting in moderate injuries that may require hospitalization, or moderate property damage or loss. Exposure to electric fields > 5 kV/m but < 10 kV/m or magnetic fields > 10 mG but < 100 mG.	
	Minor	Human Health and Safety - Event resulting in minor injuries which do not require hospitalization, or minor property damage or loss. Exposure to electric fields < 5 kV/m or magnetic fields < 10 mG.	
	Duration		
	Long-term	Human Health and Safety - Greater than 10 years to return to normal EMF: Longer than 60 months.	Project construction and operation schedule
	Medium-term	Human Health and Safety – 1 to 10 years to return to normal EMF: Impact duration greater than construction period (42 months).	
	Short-term	Human Health and Safety – Less than 1 year to return to normal EMF: Short period during start-up lasting 42 months or less.	
	Extent		
	Large	Human Health and Safety - Catastrophic event resulting in loss of life, severe injuries requiring hospitalization, or major property damage or loss. EMF: Impact is more than 300 feet outside of transmission line ROW.	EMF: Results of electric and magnetic field modeling.
	Medium	Human Health and Safety - Event resulting in moderate injuries that may require hospitalization, or moderate property damage or loss. EMF: Impact is limited to less than 300 feet outside of transmission line ROW.	
	Small	Human Health and Safety - Event resulting in minor injuries that do not require hospitalization, or minor property damage or loss. EMF: Impact is limited to transmission line ROW	
	Likelihood		
	High	Impact will occur	EMF: Results of electric and magnetic field modeling, and construction and operational procedures and schedule.
	Medium	Moderate potential for impact to occur.	
	Low	Little or no potential for impact to occur because minor measure could easily prevent impact.	

Operation

The dual-pole wood structures that would be used are climbable, although specialized equipment is required. Given that most poles would be placed on private land and that the proposed alignment only crosses about six miles of public land, public access would largely be restricted and significant effects on public safety would be unlikely. The ground clearance of the conductors would be a minimum of 26 feet, adequate clearance for safety considerations as related to most recreational activities. The recreational opportunities in the vicinity of the transmission line would also be rather limited, further reducing the likelihood that any significant effects would occur.

Electric and Magnetic Fields

EMF associated with the project was estimated using the Fields computer model (Basin Electric 2006b). The design of the structures was input into the models for each segment of the line. Voltage and expected power flow (average and peak) for that segment of the line were also input into the model. Because the magnetic field varies with the current carried on the transmission line, magnetic field strength was calculated for both the normal anticipated current load of 230 million volt-amperes (MVA) per circuit, and the maximum anticipated current load of 230 MVA per circuit.

A number of different scenarios were modeled and tested in the calculations. The calculations evaluated EMF strength at a range of distances from the centerline of the transmission line, both within and outside the approximate 125-foot ROW. The magnetic field is expressed in units of milligauss (mG); the electric field is expressed in units of kilovolts per meter (kV/m). Calculations were also performed for a number of different transmission line configurations (vertical optimized phasing orientation or vertical non-optimized phasing orientation) that can affect the EMF strength. In the optimized phasing orientation, the phases of the two circuits are offset to minimize the EMF strength. As described in Section 3.15, the focus of EMF health studies and the focus of the following impacts analysis is on magnetic fields, although electric fields are included for completeness.

Table 4.15-2 lists the modeled EMF at average and peak loads at the ROW boundary for each of the following transmission line segments (Hughes to Dry Fork, Dry Fork to Carr Draw, and Dry Fork to Sheridan). These field strengths would diminish with distance from the line. At a distance of 250 feet, they would diminish to levels close to ambient levels (Basin Electric 2006b).

Table 4.15-2 – Electric and Magnetic Fields Known to Occur on the Transmission Line Corridor at the Right-of-Way Boundary

Transmission Line Corridor	Electric Fields (kV/m)		Magnetic Fields (mG)	
	Average Loading	Peak Loading	Average Loading	Peak Loading
Dry Fork to Sheridan	0.54	0.54	16.19	18.97
Hughes to Dry Fork	0.54	0.54	6.01	8.33
Dry Fork to Carr Draw	0.54	0.54	13.88	14.80

Field Perception and Neurobehavioral Responses

Perception of the EMF field associated with the transmission lines would not be expected to be felt beyond the edge of the ROW. Persons working under the ROW might feel the field. Studies of short-term exposure to electric fields have shown that fields may be perceived (for example, felt as movement of arm hair) by some people at levels of about 2 to 10 kV/m, but studies of controlled, short-term exposures to even higher levels in laboratory studies have shown no adverse effects on normal physiology, mood, or ability to perform tasks (DOE 2001). The International Commission on Non-Ionizing Radiation Protection Guidelines recommends that short-term exposures be limited to 4.2 kV/m for the general public. The exposures associated with the proposed action are below this recommended limit, reaching a maximum of less than 2.8 kV/m within the ROW (ICNIRP 2007).

The Hughes substation would have energized equipment (transformers, circuit breakers, and buss work) that would generate magnetic fields from the electrical current flowing in and through each device. In addition, the transmission lines entering and leaving the substation would carry electrical current and thus generate magnetic fields. It is expected that the magnetic fields would be concentrated inside the substation. At the fence line of the substation the magnetic fields would be near zero except directly beneath each of the power lines that enter or leave the substation (Basin Electric 2006b).

Three residences are located within 500 feet of the reference centerline of the proposed transmission line route. Two of those residences are along the segment from Clear Creek to Beatty Gulch/Tongue River, and one is along the Beatty Gulch to Sheridan segment. These residences are over 250 feet away from the proposed ROW, and EMF would be reduced to ambient levels in these areas. Therefore, no impacts to these residences related to EMF would be expected to occur from operation of the proposed Hughes Transmission Line.

Thirty-six CBM wells are located outside of the ROW but within 250 feet of the reference centerline of the proposed Hughes Transmission Line route. Based on the construction of the wells and the strength of EMF outside of the ROW, the magnitude of the effects from EMF would be minor, though of long-term duration and medium extent. Despite the proximity of these wells, the likelihood that significant effects would occur from the proposed Hughes Transmission Line would be low because human activity would consist of short-term exposure of workers performing routine maintenance at the well sites.

Exposure to Induced Currents and Shocks

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, towers, vegetation, buildings, vehicles, and persons. Potential field effects would include induced currents, steady-state current shocks, and spark discharge shocks.

Induced Currents

The 230-kV transmission lines would have a minimum ground clearance of 26 feet (Basin Electric 2006b) to reduce the potential for induced current shocks. In addition, permanent structures in the ROW, such as fences, gates, and metal buildings, would be grounded.

Steady-State Current Shocks

Features reducing the level of potential for induced current in objects near the transmission line also reduce the level of a possible induced current shock. The proposed lines would be constructed in accordance with industry standards to minimize hazardous shocks from direct or indirect human contact with an overhead, energized line. These lines are not expected to pose any such hazards to humans.

Spark Discharge Shocks

In accordance with industry transmission line standards, the magnitude of the electric field would be low enough that spark discharge shocks would occur rarely, if at all. The potential for nuisance shocks would be minimized through standard grounding procedures. Carrying or handling conducting objects, such as irrigation pipe, under transmission lines can result in spark discharges that are a nuisance. The primary hazard with irrigation pipes or any other long objects, however, is electrical flashover from the conductors if the section of pipe is inadvertently tipped up near the conductors. The transmission lines would be constructed with adequate ground clearance to minimize these effects.

Corona Effects

Corona is the electrical breakdown of air into charged particles caused by the electrical field at the surface of conductors. For human health effects, corona is of potential concern because of the generation of audible noise.

Noise levels generated by the transmission lines would be greatest during damp or rainy weather. For the proposed lines, low-corona design established through industry research and experience would minimize the potential for corona-related audible noise. The proposed lines would not add substantially to existing background noise levels in the area. Research by the Electric Power Research Institute (1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-foot safety zone. During rainy or damp weather, an increase in corona-generated audible noise would be balanced by an increase in weather-generated noise. For an assessment of the noise from the proposed Project and alternatives, refer to Section 4.6.

Based on the above modeling and analysis of effects, the potential for significant impacts on human health and safety from operation of the proposed Hughes Transmission Line is low.

4.15.3.2 *Alternative Alignment*

Construction

Impacts resulting from the construction of the alternative transmission line would be comparable to those described for the proposed Hughes Transmission Line.

Operation

Impacts resulting from the alternative corridor would be similar to those described for the proposed Hughes Transmission Line. If the alternative transmission line were constructed, an additional substation north of Sheridan would not be constructed as part of this project, due to the configuration of the existing lines in the area. However, compared to the proposed Hughes

Transmission Line, this alternative has fifteen residences within 500 feet of the reference centerline. Given that EMF would be expected to diminish to ambient levels at a distance of 250 feet from the centerline, the likelihood that significant effects would occur from the alternative transmission line would be low.

4.15.4 Conclusions

All impacts on public health and safety identified for either the construction or operation of the proposed Dry Fork Station and the alternative power plant or the proposed Hughes Transmission Line and the alternative transmission line would be less than significant.

4.16 SOCIOECONOMICS

4.16.1 Impact Criteria

Impact threshold criteria for the socioeconomic evaluation were used to determine the degree of potential impacts from the project. Table 4.16-1, found on the following page, summarizes these criteria. Issues identified as those which could be impacted by the project are listed in the first column of the table.

4.16.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.16.3 Power Plant

4.16.3.1 Proposed Site

Construction

Housing, Population, and Employment

Under the proposed action, 1,019 construction workers would be needed during the peak of construction. Of that total, 224 workers (22 percent) are expected to be hired from the local labor force, and the remaining 795 workers (78 percent) are expected to be hired from other areas. It is estimated that of the 795 workers hired from other areas, 95 (12 percent) of them would commute from surrounding counties and not relocate. Of the 700 workers expected to relocate to the area during construction, it is estimated that 329 (47 percent) would bring their families, with an anticipated average household size of 2.5 persons (Basin Electric 2006a). This translates to a total of 1,194 persons relocating to Campbell County and/or the city of Gillette during the peak construction period for the proposed project. The additional workers and their families represent roughly a 3.0 percent short-term increase in the projected 2010 population in Campbell County of 43,090 (Wyoming Department of Administration and Information 2005). This increase would be considered a short-term, minor effect with a high likelihood of occurring over an area of large extent, resulting in impacts on population that would be less than significant.

With a 3.0 percent increase in population and people relocating to the area over a relatively short time period during construction, there would be an increased short-term demand for housing. Without the project, Campbell County is expected to experience a housing shortage towards the end of construction. However, the shortage is expected to be in homeowner households and not in rental households (CH2M Hill 2006b), where most temporary workers would be expected to live. It is likely that the construction workforce would reside in Gillette, since the majority of rental housing in the area surrounding the project is within the city limits. Rental housing in Gillette is currently at its carrying capacity, a situation that is projected to continue through 2020. It is, therefore, likely that workforce-induced population growth may require the construction of additional rental housing, along with use of motels and hotels in the area. Basin Electric would implement a mitigation plan to address the needs associated with a temporary construction workforce made up of single workers, married workers, and married workers relocating with their families. The mitigation plan is centered on a four-pronged approach to house the anticipated 700-person import workforce and their families (1,194 persons total) over the 42-month construction period. The housing options in the plan include RV spaces (150 workers and family estimated), apartments (200 workers and family estimated), hotel rooms (200 single workers estimated), and a base camp (150 workers estimated). It is anticipated that this mitigation plan would further minimize socioeconomic impacts to the area.

Short-term direct job creation during construction would lower the unemployment rates slightly in Campbell County from 4.4 percent to 3.2 percent, a 1.2 percent decrease. However, due to the short-term nature of the construction jobs, the anticipated benefit would also be temporary. The creation of jobs during construction of the proposed Dry Fork Station is not expected to permanently affect the employment rates in Campbell County; therefore, impacts on employment would be less than significant.

The estimated wages for the construction workforce are expected to be slightly higher than the local wages paid for similar construction jobs (CH2M Hill 2006), but this would have a minor effect on the economy due to the short-term nature of the construction employment.

Property Values

Within the analysis area (Campbell and Sheridan Counties), the addition of a temporary workforce or actual construction of the Dry Fork Station would not be expected to significantly affect property values. However, to the extent that demand for housing in the Gillette area remains strong, property values could increase.

Government Revenue

It is anticipated that Campbell County would experience an increase in the assessed value of the property from the conversion of land to utility land use resulting in an increase in ad valorem taxes. Ad valorem taxes totaling \$5,141,000 would be collected over the duration of construction, based on the percent of the project completed as of January 1 of each year of construction. The Basin Electric tax department has estimated an ad valorem tax rate of 0.275 percent, incorporating; a pollution control equipment exemption, an allocation factor, an obsolescence factor, 11.5 percent value, and a 58.918 mill levy (2004 value). Ad valorem taxes would result in a benefit to Campbell County of approximately \$2 million annually upon completion of construction of the project (Basin Electric 2006a), a change of less than 2 percent.

Table 4.16-1 – Issues and Significance Criteria for Socioeconomics–Power Plant and Transmission Line

Proposed Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it would result in the change in population, employment, housing, tax base, and property values in the project area, meeting moderate magnitude criteria. An effect would be determined to be significant if the proposed action has a high likelihood of resulting in more than a 3 percent permanent change in population, employment, or housing and a 2 percent change in the affected county’s tax base. Effects on community resources and cohesion would be evaluated qualitatively based on interviews with community officials and information presented as part of the Wyoming Industrial Siting Act process.			
	Criteria	Definition	Measurement	
<ul style="list-style-type: none"> Housing during construction period, population, employment, effects to community resources Revenue to local and state governments Effects of construction on property values Effects on community resources and cohesion 	Magnitude			
	Major	More than a 3 percent permanent change in population, employment, or housing. A greater than 10 percent change in per capita income. Greater than 10 percent of land withdrawn from the County’s tax base. Division of a community or separation of a community from community resources. Infrastructure or services required beyond the capacity of existing levels, to the extent that community members would be negatively affected.	Projected changes to population, employment, or housing because of project development. Qualitative evaluation of effects on community resources and cohesion.	
	Moderate	2 to 3 percent change in permanent population, employment, or housing. 5 to 10 percent change in per capita income. 2 to 10 percent of land withdrawn from the County’s tax base. Some obstacles to community cohesion or some separation of a community from community resources. Additional infrastructure or services required, but not to an extent that community members would be negatively affected.		
	Minor	Less than 1 percent permanent change in population, employment, or housing. Larger percentage change in temporary population because of construction of the project. Less than 5 percent change in per capita income. Less than 2 percent of land withdrawn from the County’s tax base. No major division of a community or separation of a community from community resources. Increased use of infrastructure and services within the capacity of existing levels to provide.		
	Duration			Project construction and operation schedule.
	Long-term	Longer than 60 months.		
	Medium-term	Impacts of duration more than construction period (42 months – Dry Fork Station; 18 months – Hughes Transmission Line) but not exceeding 60 months.		
Short-term	Short period during construction or startup lasting less than 42 months (Dry Fork Station) or 18 months (Hughes Transmission Line).			

Table 4.16-1 – Issues and Significance Criteria for Socioeconomics–Power Plant and Transmission Line (Continued)

Proposed Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it would result in the change in population, employment, housing, tax base, and property values in the project area, meeting moderate magnitude criteria. An effect would be determined to be significant if the proposed action has a high likelihood of resulting in more than a 3 percent permanent change in population, employment, or housing and a 2 percent change in the affected county’s tax base. Effects on community resources and cohesion would be evaluated qualitatively based on interviews with community officials and information presented as part of the Wyoming Industrial Siting Act process.		
	Criteria	Definition	Measurement
	Extent		
	Large	Impact is to the county and surrounding communities.	Results of analysis of projected extent of impacts.
	Medium	Impact is limited to the project site and surrounding area.	
	Small	Impact is limited to immediate project site.	
	Likelihood		
	High	The impact would occur based on results of analysis.	Results of analysis and construction and operational procedures and schedule.
	Medium	Moderate potential for the impact to occur.	
	Low	Little to no potential for the impact to occur.	

Sources: Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; Council on Environmental Quality: Environmental Justice, Guidance Under the National Environmental Policy Act and the Wyoming Industrial Siting Act Application/Report.

The estimated total sales and use taxes that would be paid on the materials purchased for the construction of this project is \$13,135,238 in state taxes and \$4,104,762 in county option taxes, for a combined total of \$17,240,000 in sales and use taxes (Basin Electric 2006a).

The estimated total sales and use taxes that would be paid on the materials purchased for the construction of this project is \$13,135,238 in state taxes and \$4,104,762 in county option taxes, for a combined total of \$17,240,000 in sales and use taxes (Basin Electric 2006a).

Impacts on government revenue would be beneficial and less than significant.

Community Resources and Cohesion

An additional 1,261 students would have to enroll in the Campbell County School District 1 for the student to teacher ratio of 13.5 to exceed that of the national ratio. It is estimated that an additional 164 school-age children would be enrolled in the school district during the peak period of construction. The additional students would result in a minor change in the student to teacher ratio. Without the project, the citizen to police ratio per 1,000 citizens in Campbell County in 2010 is projected to be 2.42, which is similar to the ratio of 2.5 in Wyoming and the US in general. With the addition of the construction workforce to the projected 2010 population, the ratio would be reduced to 2.36. In addition, the citizen to firefighter ratio per 1,000 citizens in Campbell County in 2010 is projected to be 4.6, which is higher than the ratio of 1.8 in Wyoming and the US in general. With the addition of the construction workforce to the projected 2010 population, the ratio is reduced slightly to 4.48, which is still higher than the state or national average (Basin Electric 2006a).

For both law enforcement and firefighters these numbers do not account for any change in the number of these civil servants. Neither ratio falls by more than one percent with the addition of the construction workforce and associated family members. As a result, the project would have a

minor, short-term impact on the availability of public safety and fire protection services in Campbell County.

The carrying capacity of the Campbell County health services is already being exceeded. With the addition of the construction workforce and its families, the number of physicians per 100,000 citizens in 2010 would drop from 109 without the project to 106 with the project, a short-term decrease of about 2.8 percent. The number of beds available per 100,000 citizens would change from 295 to 287, also an approximate short-term decrease of 2.8 percent. These decreases would be considered moderate, but less than significant effects.

Gillette's water system has a capacity of 12,865 gpm. It is estimated that in 2010, peak-day demand would be 8,877 gpm, which is less than the system capacity. The estimated wastewater flow in Gillette in 2010 is 2.65 mgd. The design flow capacity of the facility is 3.85 mgd. This excess capacity indicates that future population growth generated by the proposed action would be accommodated by existing water and wastewater infrastructure.

Overall, impacts on community resources during construction would be minor, short-term, large in extent, and highly likely. Under the significance criteria stated in Section 4.16.1, impacts would be less than significant.

Operation

Housing, Population and Employment

Impacts from operation of the Dry Fork Station would be less than significant. Once the facility is constructed, it is estimated that 75 permanent full-time workers would be required for operation. It is expected that 50 percent of the operational workforce would be hired from the local labor force, while the other half would be hired from outside areas. Of the 38 workers expected to relocate to the area, 78 percent are expected to bring their families, with an average household size of 2.5 persons. The additional 80 persons relocating to the area represent a 0.2 percent increase in the projected 2010 population of Campbell County, which represents a minor long-term effect. Due to the small number of permanent full-time jobs to be created (75), it is anticipated that the operation of the proposed Dry Fork Station would have a minor long-term positive effect on the unemployment rates in Campbell County. The 2005 unemployment rate for Campbell County is 2.3 percent. It is anticipated that with the addition of 75 permanent full-time jobs that the unemployment rate would fall to 2.0 percent. However, the increase in the coal that is mined in the area to support the proposed Dry Fork Station is likely to have an indirect economic multiplier effect, which could include boosting revenues and generating additional jobs and income.

Government Revenue

The proposed action would be likely to generate an increase in the amount of coal mined in the area of impact after commencement of operations, which would result in additional mineral severance tax revenues for Campbell County (Basin Electric 2006a). It is anticipated that Campbell County would experience an increase in revenue from ad valorem and sales and use tax. The Basin Electric tax department has estimated an ad valorem tax rate of 0.275 percent. State sales and use taxes are 4 percent of the value of goods or property purchased. Campbell County also assesses a 1.25 percent county option tax (CH2MHill 2006b).

Community Resources and Cohesion

Similar to the effects described for the construction of the proposed Dry Fork Station, there would be 75 permanent full-time workers, with 38 of those workers relocating to the area. A total population increase of approximately 80 would result in a minor effect on community resources that would be long-term, large in extent, and highly likely. Under the significance criteria stated in Section 4.16.1, impacts would be less than significant.

4.16.3.2 *Alternative Site*

Construction

Due to the proximity of the preferred and alternative sites, it is anticipated that potential construction impacts to socioeconomic and community resources would be the same for both alternatives. Impacts would be less than significant.

Operation

Due to the proximity of the preferred and alternative project sites, it is anticipated that potential impacts to socioeconomic and community resources resulting from facility operations would be the same for both alternatives. Impacts would be less than significant.

4.16.4 *Transmission Line*

Because the proposed and alternative transmission line alignments are in the same general area, for the purpose of socioeconomic analysis, each alternative would generate similar effects, with the exception of potential impacts on residential property. In general, effects upon residential properties and structures would be avoided; however, for the residential properties on which ROW easement acquisition would occur, property owners would be compensated for the use of their land at fair market value. No residential relocations would occur.

Construction

Housing, Population and Employment

Construction of the proposed Hughes Transmission Line and ancillary facilities is expected to take 16 to 18 months. Two contractors are anticipated to be hired to complete the work. Each contractor would have a crew of 40 to 50 workers, and both crews would be working at the same time. Therefore, the combined peak workforce could potentially reach 100 workers. Approximately 40 percent of transmission line construction workers would be hired from the local area and approximately 60 percent of workers would be hired from out of state (Basin Electric 2006f). Assuming that 53 percent of all non-local workers would relocate without other household members (CH2M Hill 2006b), approximately 28 workers would bring their families. At a household size of 2.5 persons per household (CH2M Hill 2006b), the total population increase would be approximately 102. A population increase of 102 would result in a minor short-term effect on housing, local infrastructure, and public services. Economic benefits to Campbell and Sheridan Counties would include taxes on worker salaries and sales taxes on the purchases of equipment, construction materials, lodging, food, and other personal supplies. Revenues would also come from ROW fee payments. Table 4.16-2 summarizes the economic effects of construction.

Table 4.16-2 – Projected Value of Direct Economic Effects

Type of Effect	Benefit		Impact
	Campbell County	Sheridan County	
Out-of-State Employment	Increased tax revenues		Housing and services for 60 workers
Local Construction Wages	\$4,000,000		None
Transmission Line Materials Expenditures	\$9,090,000	\$5,910,000	None
Sales/Use Tax Revenues from Transmission Line Materials	\$477,225	\$354,600	None
Substation Materials Expenditures	\$700,000	\$2,400,000	None
Sales/Use Tax Revenues from Substation Materials	\$36,750	\$144,000	None
Right-of-Way Fee Payments to Property Owners	\$2,231,940	\$1,451,130	None

Source: Basin Electric 2006f

Either transmission line alignment would require approximately \$10,000,000 in construction wages (Basin Electric 2006f), \$4,000,000 (40 percent) of which would go to construction workers in the local economy. Over the short term, this could have a multiplier effect as these additional dollars are spent on goods and services in the economy of Campbell and Sheridan Counties, generating additional revenue.

Standard materials used in the construction of the proposed Hughes Transmission Line and ancillary facilities may be purchased from local suppliers; however, specialized transmission line products would need to be purchased from specialized suppliers throughout the US. Using linear transmission alignments, it has been estimated that approximately 60.6 percent of the transmission line would be in Campbell County and 39.4 percent would be in Sheridan County. Given that the local material portion of total project costs would be \$15,000,000, approximately \$9,090,000 would be spent in Campbell County and about \$5,910,000 would be spent in Sheridan County (Basin Electric 2006f). These expenditures could generate a multiplier effect in the local economy, creating additional income and employment.

Government Revenue

The sales/use tax rate for Campbell County would include the 4.0 percent state sales tax plus a county option sales tax of 1.25 percent for a total of 5.25 percent. Based on this 5.25 percent tax rate, the total sales/use tax for transmission line materials in Campbell County would be \$477,225. The sales/use tax rate for Sheridan County would include the 4.0 percent state sales tax plus a county option sales tax of 2.0 percent for a total of 6.0 percent and a total sales/use tax for transmission line materials in Sheridan County of \$354,600.

Project substation materials costs would total \$3,100,000. Of this total, \$700,000 would be spent in Campbell County, and \$2,400,000 would be spent in Sheridan County. The total sales/use tax for substation materials purchased in Campbell County would be \$36,750 based on the 5.25 percent tax rate, and for Sheridan County it would be \$144,000 based on the 6.0 percent tax rate (Basin Electric 2006f).

Community Resources and Cohesion

Similar to the effects described for the construction of the Proposed Dry Fork Station, an increase of 60 construction workers and a total population increase of 102 would result in an effect on community resources that would be minor, short-term, small in extent, and probable. Under the significance criteria stated in Section 4.16.1, impacts would be less than significant.

Operation

No long-term socioeconomic effects would be expected from operation of the proposed or alternative Hughes Transmission Line, since no changes would occur to population, housing, employment, income, or community facilities.

4.16.5 Conclusions

At either location, the proposed Dry Fork Station would have less than significant socioeconomic impacts in Campbell County. While a small increase in population and housing demand would result from the short-term influx of construction staff, it is expected to be limited to the duration of construction. Additionally, Basin Electric's mitigation plan to alleviate potential effects of the temporary workforce on the supply of housing would aid in ensuring impacts are less than significant. The proposed and alternative transmission line alignments would not be expected to have significant socioeconomic impacts in Campbell or Sheridan Counties. Impacts for each would be the same: a minor short-term population increase that would occur during construction would have a minor short-term effect on the housing supply.

4.17 ENVIRONMENTAL JUSTICE

4.17.1 Impact Criteria

Significance threshold criteria for the environmental justice evaluation were used to determine the potential for impacts on environmental justice populations from the project. Table 4.17-1 summarizes the criteria categories. The issues of primary concern are that the project could disproportionately affect minority and low-income populations. No BMPs were needed to minimize impacts.

4.17.2 No Action Alternative

Under the No Action Alternative the Dry Fork Station would not be constructed, but the Hughes Transmission Line would still be constructed. Thus, under the No Action Alternative, impacts would be those described for the transmission line only.

4.17.3 Power Plant

4.17.3.1 Proposed Site

Construction

Although a small number of low-income and minority residents would be within the Dry Fork Station proposed action project area (Block Groups 1 and 3 of Census Tract 7), no specific locations or groups were identified that would be disproportionately affected by the proposed action. Construction of the Dry Fork Station would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1. The proposed action is in compliance with EO 12898, USDA Department Regulation 5600-2, and Rural Development Instructions 2006-P.

Operation

Potential impacts from operation would be the same as those identified for construction. Operation of the Dry Fork Station would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1.

4.17.3.2 *Alternative Site*

Construction

Although a small number of low-income and minority residents would be within the alternative action project area (Block Group 1 of Census Tract 7), no specific locations or groups were identified that would be affected by the alternative action, nor would the impact be disproportionate compared with the surrounding area. Therefore, the alternative action does not have the potential to exert high or disproportionate adverse impacts on minority or low-income populations. Construction of the alternative power plant would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1. The alternative action is in compliance with EO 12898, USDA Department Regulation 5600-2, and Rural Development Instructions 2006-P.

Operation

Potential impacts from operation would be the same as those identified for construction. Operation of the Dry Fork Station at the alternative site would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1.

4.17.4 **Transmission Line**

4.17.4.1 *Proposed Alignment*

Construction

Although a small number of low-income and minority residents were identified within the project area, no specific locations or groups have been identified that would be affected by the proposed action. Therefore, construction of the proposed Hughes Transmission Line would not disproportionately affect low-income or minority populations according to the significance criteria defined in Section 4.17.1. The proposed action is in compliance with EO 12898, USDA Department Regulation 5600-2, and Rural Developmental Instructions 2006-P.

Operation

Operation of the Hughes Transmission Line would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1. The proposed action is in compliance with EO 12898, USDA Departmental Regulation 5600-2, and Rural Development Instructions 2006-P.

Table 4.17-1 – Issues and Significance Criteria for Environmental Justice – Power Plant and Transmission Line

Power Plant and Transmission Line Issues Identified	Significance Threshold: An effect would be considered significant if it is associated with adverse impacts, regardless of duration or extent, on minority or low-income populations present in the project area. These populations would be defined by per capita income, poverty level, and race, using data from the 2000 US Census for the census tract block groups encompassing the project area.		
	Criteria	Definition	Measurement
<ul style="list-style-type: none"> Concern that minority and low-income populations may experience disproportionately high and adverse human health and environmental impacts 	Magnitude		
	Major	Impact that affects an entire minority or low-income community.	Project effects to minority or low-income communities.
	Moderate	Impact that affects a portion of a minority or low-income community.	
	Minor	Minimal to no impact on minority or low-income communities.	
	Duration		
	Long-term	Longer than 60 months.	Project construction and operation schedule.
	Medium-term	Impacts of duration more than construction period (42 months – Dry Fork Station; 18 months – Hughes Transmission Line) but not exceeding 60 months.	
	Short-term	Short period during construction or startup lasting less than 42 months (Dry Fork Station) or 18 months (Hughes Transmission Line).	
	Extent		
	Large	All minority or low-income communities are affected.	Results of analysis of projected extent of impacts.
	Medium	Several minority or low-income communities are affected.	
	Small	Localized or no minority or low-income communities are affected.	
	Likelihood		
	High	The impact will occur under typical operating conditions.	Results of analysis and construction and operational procedures and schedule.
	Medium	The impact will occur under worst-case operating conditions.	
Low	Little to no potential for the impact to occur.		

Sources: Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; Council on Environmental Quality: Environmental Justice, Guidance Under the National Environmental Policy Act; and the Wyoming Industrial Siting Act Application/Report.

4.17.4.2 Alternative Alignment

Construction

Due to the proximity of the preferred and alternative transmission line alignments and because no specific environmental justice populations have been identified within the area that would be affected by the construction of either the proposed or alternative transmission line, it is anticipated that potential impacts would be the same for both alternatives. Construction of the alternative transmission line would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1.

Operation

Potential impacts from operation would be the same as those identified for construction. Operation of the alternative transmission line would have no impact on environmental justice populations according to the significance criteria defined in Section 4.17.1.

4.17.5 Conclusions

The proposed Dry Fork Station and the alternative power plant site would have no environmental justice impacts in the project area. While low-income and minority residents are present in the area, these groups would not be disproportionately impacted by the project compared with others in the surrounding area.

Neither the proposed nor the alternative Hughes Transmission Line alignments would have an environmental justice impact in the project area. While low-income and minority residents are present in both Campbell and Sheridan Counties, these groups would not be disproportionately impacted by the project.

4.18 UNAVOIDABLE ADVERSE IMPACTS

The construction and operation of the proposed power plant and Hughes Transmission Line would result in some unavoidable adverse environmental impacts in Wyoming and in the United States. This section describes those impacts.

Soils, Topography, and Geology

Under the proposed action, approximately 120 acres for the power plant and approximately 63 acres for the ash landfill would be disturbed. The construction and operation of a power plant and its associated infrastructure would involve extensive site grading and excavation activities that would compact and displace soil and alter the topographic contours of the Dry Fork Station site and its vicinity.

Vegetation removal and soil compaction would occur in the work areas for both the Dry Fork Station and the transmission line during site grading and use of access roads, resulting in potential erosion impacts.

Erecting the transmission line structures would directly impact less than 2 acres of soil.

During the construction phase localized erosion could increase above natural levels, with soil being deposited down slope. This process continues after construction with decreasing intensity until a stable condition is reached. BMPs would minimize erosion impacts during construction, and revegetating construction roads would mitigate long-term impacts.

Water Resources

Construction and operation of the proposed power plant could increase storm water runoff, potentially carrying sediment and contamination loads into surface water. There is a minor risk of contamination of groundwater and surface waters in the vicinity of the site. However, storm water retention ponds would minimize impacts to the extent possible. Water would be withdrawn

from the Lance-Fox Hills aquifer.

Air Quality

Impacts from the proposed action would result in adverse but not significant impacts on air quality. Impacts related to construction activities would include exhaust and fugitive dust emissions generated by the operation of construction vehicles, which would cause minor, localized impacts. Emission of criteria pollutants and/or trace element deposition would cause adverse impacts of minor magnitude to regional air quality in the long term.

Additionally, operation of the Dry Fork Station would cause offsite impacts on PSD Class I increments and several AQRVs (visual plume, regional haze, and acid deposition), which would be an adverse minor to moderate magnitude impact. None of these impacts would be significant in and of themselves, though they would contribute small but measurable increments to identified environmental resources in the Class I areas. Releases of greenhouse gases and mercury would be adverse and represent a minor incremental contribution to other air quality impacts.

Noise

During construction, daytime noise would increase in areas near the power plant site and transmission line ROW and in areas near the ROW. Since this impact is primarily associated with the construction phase, it would be short term and temporary. Operational noise impacts on surrounding residences were determined to be less than significant.

Biological Resources

Construction and operation of the proposed power plant will result in the unavoidable loss of approximately 120 acres of disturbed habitat at the proposed site and relatively undisturbed sagebrush habitat at the alternative site. The habitat is likely used by big game, small mammals, neotropical migrants, and foraging raptors. No tree nesting habitat is present onsite but occurs nearby. Ground nesting raptor habitat is present. Wintering eagles have been observed in the area surrounding both sites. Greater sage-grouse probably use the sagebrush habitat at the alternative site, since an active lek has been identified 0.75 miles from the alternative site. Wetlands occur on both sites and their use as habitat by waterfowl may be decreased by the project development.

Construction and operation in the proposed and alternative transmission line corridors will likely result in the unavoidable abandonment of greater sage-grouse leks in the ROW and some undetermined distance from the ROW. An active Columbian sharp-tailed grouse lek was identified in the ROW of the alternative alignment. Even with the use of mitigation (perch deterrents, timing constraints, and buffers), increased predation from perching raptors may, over the long term and in combination with the impacts of other development, result in the loss of local populations of upland game birds.

Construction in and maintenance of the alignment ROWs are likely to result in the unavoidable degradation of native plant communities by spreading noxious and invasive weeds along the corridor unless weed management plans are enforced. Even with the use of mitigation (flight diverters), the proposed transmission lines will likely result in increased mortality and injuries from power-line collisions by raptors, migratory birds and other avian species. Stream crossings

by the alignments will likely result in the isolated loss of riparian tree nesting habitat from cutting or topping tall trees that may interfere with transmission line operation and safety.

These impacts combined would result in adverse, though less than significant impacts, on biological resources.

Transportation

The proposed action would result in minor short-term adverse impacts on traffic congestion from activities related to construction of the power plant and its associated facilities.

Visual

Since portions of each alternative would be visible to some local residents, the proposed project would have an adverse long-term impact on the viewshed. This would alter the visual setting in the vicinity of the proposed project.

Human Health and Safety

The proposed action would result in adverse and minor-magnitude impacts on public health and safety. Construction of the power plant and associated facilities would expose construction workers to short-term health and safety risks typically faced in the construction industry. Traffic volumes and the presence of heavy construction equipment on site access roads could potentially cause a negligible to minor increase in vehicular accidents.

4.19 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of “any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” This section thus describes irreversible and irretrievable commitments of resources associated with the implementation of the proposed action, as described in Chapter 2 of this EIS.

Irreversible resource commitments are related to the use of nonrenewable resources such as soils and visual resources and the effects that the uses of these resources would have on future generations. Such actions are considered irreversible because their implementation would affect a resource that has deteriorated to the point that renewal can occur only over a long period or at great expense, or because they would cause the resource to be removed or destroyed.

Irretrievable resource commitment of natural resources means loss of production or use of resources as a result of a decision. It represents opportunities forgone for the period of time that a resource cannot be used. Irretrievable refers to the permanent loss of a resource including extinction of a threatened or endangered species, disturbance of a cultural site, loss of land production, or use of natural resources. For example, the use of coal for fuel is an irretrievable commitment because the coal can not be returned.

A commitment of resources is irreversible when primary or secondary impacts limit the future options for a resource. It applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable

only over long periods of time. An irretrievable commitment refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations. It applies to the loss of production, harvest, or use of natural resources.

Both irreversible and irretrievable commitments of resources would occur under the proposed action and alternatives. An irreversible commitment of land and visual resources would occur where relatively undisturbed land would be disturbed by the proposed project. The proposed project would introduce human alterations to the natural landscape in areas. The visual resources are irretrievable during the project because the visual quality would be impaired though not lost.

The construction and operation of the proposed power plant, and its associated facilities and infrastructure would require the commitment of approximately 120 acres of land for the plant footprint, an additional 63 acres for the ash landfill site, and 1.6 acres for the location of transmission line poles, with extensive excavation and/or grading of soil within these areas. This commitment would be irreversible for the life of the power plant. While it is possible that these structures, roads, and transmission line corridors could be removed and the natural landscape renewed, this is unlikely in the foreseeable future.

If the project were removed the area would eventually revert back to its original visual state, and the habitat would revert to its original form and function, provided no additional disturbance occurs. RUS does not expect this to occur. Placing the poles and constructing the substations for the transmission line would have irretrievable and irreplaceable impacts on soils, vegetation, and cultural resources, including removal of small areas of farmland from potential use for agriculture. Some clearing of rangeland may be required during construction of the proposed Hughes Transmission Line, but only the land directly beneath the new structures would be irreversibly committed. The loss of soil and productivity would be irreversible where permanent structures are constructed. The direct loss of vegetation due to clearing and construction is irretrievable, but it could be reduced by application of the BMPs identified in Chapter 2. Specific impacts to vegetation would be identified and mitigated upon precise siting of the ROW within the chosen corridor.

Construction of the Dry Fork Station would result in both the irreversible and irretrievable use of construction materials. Many of the materials used for constructing the plant, in particular the steel and other metals that would have to be committed, are ultimately recyclable but would remain an irreversible commitment of resources for the life of the project. Other construction materials, such as insulation materials, plastics, concrete, siding, piping, and so forth, would in large part likely represent an irretrievable use of materials, as upon any demolition of structures at the end of the project life, these materials would be ultimately disposed of at a landfill. However, most land uses, including grazing, could continue once the transmission line is in operation.

Moderate quantities of fossil fuels would be irretrievably consumed during the construction of the power plant and its associated facilities. Diesel fuel and gasoline would be consumed by construction equipment such as bulldozers, backhoes, earth scrapers, motor graders, heavy haul trucks, large tractors, concrete trucks, asphalt pavers, concrete pavers, rollers and compactors, and cranes during the 42 months estimated for completion of construction activities. Aviation fuel would be consumed by helicopters if they were used in assisting in construction-related

activities. The consumption use of fuel during construction activities would not constitute a long-term drain on local resources.

During operation of the Dry Fork Station, approximately 5,500 tons per day of PRB coal would be irretrievably consumed. This equals an annual total of about 2 million tons. The 2004 production from the Dry Fork Mine was 4.5 million tons (Basin Electric 2006a).

Construction of the transmission line structures and substations would require the irretrievable commitment of standard building materials and fuel for construction equipment. An unknown quantity of water would be used during construction. The resources irretrievably committed for operation of this project would be relatively minor quantities of fuel for maintenance vehicles, operating supplies, and miscellaneous chemicals. Theoretically, construction of the transmission line is a reversible commitment of land. In practice it is an irretrievable commitment of land use, as the transmission line and its support structures would not be removed.

4.20 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section discusses the proposed project's short-term use of man's environment and the maintenance and enhancement of long-term productivity. The impacts and utilization of resources associated with the proposed project are described in Chapter 4.

NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with a proposed action. This involves the consideration of whether a proposed action is sacrificing a resource value that might benefit the environment in the long term, for some short-term value to the sponsor or the public.

In the context of the short-term uses of the environment associated with the operation of the Dry Fork Station and Hughes Transmission Line and the long-term impairment of environmental resources as they have been analyzed in this EIS, short term refers to the period of time encompassing the construction of the power plant and its associated facilities to the period of time encompassing the disassembly of the plant and subsequent restoration and rehabilitation activities. Long-term refers to that period of time following restoration and rehabilitation activities, during which consequent impacts from the proposed action still affect the environment.

The proposed short-term uses of the environment associated with the proposed action are the development of 120 acres of land for the footprint of the power plant and additional land for roadway; 63 acres of land for an ash landfill site; the consumptive use of 300 million gallons of groundwater annually; the direct loss of soils, vegetation, and wildlife habitat, and livestock grazing lands; and the consumptive use of coal and other nonrenewable resources.

Losses of terrestrial plants and animals and habitats from natural productivity (although minor) and temporary disturbances during construction are possible. Land clearing and construction activities resulting in personnel and equipment moving about an area would disperse wildlife and temporarily eliminate habitats. Short-term disturbances of previously undisturbed biological

habitats from the construction of the transmission line and other structures could cause long-term reductions in the biological productivity of an area.

The proposed action's impacts on minimally disturbed or previously undisturbed land both within northeastern Wyoming on private land and on a small portion of BLM-managed public land may affect cultural resources and would affect long-term visual resources. A portion of each alternative transmission line alignment crosses undeveloped land, impacting long-term preservation of unaltered landscapes. Portions of each alternative would be visible from many locations on and off private lands. The potential for disturbing cultural resources in previously undisturbed lands would be mitigated by conducting cultural resource surveys along the proposed ROW.

Upon retirement, disassembly, and abandonment of the power plant and its associated facilities, the developed land would be returned to uses similar to the currently existing use of predominantly low-to-moderate-valued rangeland. The projected period before natural conditions return to an approximate pre-project status within the project area is expected to exceed several decades following completion of restoration activities. Organic content, biological activity, and horizon development in the replaced soil surface layers of the project area would be expected to take an especially long time to approach pre-construction conditions.

Water withdrawals from the Lance-Fox Hills aquifer would cease immediately and concurrently with retirement of the power plant. As a result, the drawdown of the aquifer would cease and it would eventually return to a confined, or fully saturated, state.

The short-term social gains associated with the proposed action would result in beneficial long-term socioeconomic productivity in the vicinity of the project site. The proposed action would generate net socioeconomic benefits for the local and regional economy over the anticipated time of the project life and, to some extent, for several decades thereafter.

5.0 CUMULATIVE IMPACTS

The Council on Environmental Quality's (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 Code of Federal Regulations [CFR] Part 1508.7). The regulations further explain "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." CEQ guidance also limits cumulative impact assessment analysis to "important issues of national, regional, or local significance" (CEQ 1997). Because of the geographic scope of a cumulative impact assessment and the variety of activities assessed, cumulative impacts are commonly examined at a more qualitative and less detailed level than are the direct and indirect impacts. CEQ guidance states that "agencies are not required to list or analyze effects of individual actions unless such information is necessary to describe the cumulative effect of all past actions combined," and CEQ regulations "do not require agencies to catalogue or exhaustively list and analyze all individual past actions" (CEQ 2005). The cumulative impacts analysis should focus on what is relevant and necessary to inform decision making.

Cumulative effects may be adverse, beneficial, or both. The cumulative effects analysis presented in this Chapter for each resource area is based on the potential effects of the proposed project added to past, present, and reasonably foreseeable future actions and their effects in the regions of influence for each resource.

Chapter 3 previously described the existing conditions of the potential affected resource areas. The environmental conditions described are a result of past and present actions within and in the vicinity of the proposed activities. Potential cumulative effects from the incremental contribution of the Proposed Action and Alternatives were assessed according to their location and time frame (context) of occurrence and impact severity (intensity) when added to other reasonably foreseeable regional activities, projects, or plans. Determining the boundaries and time periods considered depends on the characteristics of the resources affected, the magnitude and scale of the project's impacts, and the environmental setting.

Actions and events included in the cumulative impact analysis do not affect all resources equally. Some resources would be affected by several or all of the described activities, while others would be affected very little or not at all. The actions and events that make up the cumulative impact scenario were analyzed in conjunction with the impacts of each alternative to determine if they would have any additive or interactive effects on a particular resource. Chapter 4 presents the potential impacts of the Proposed Action and Alternatives by resource area. This Chapter presents cumulative impacts for the No Action Alternative, the Proposed Action, and Alternatives for only those resource areas where potential impacts were identified.

Public documents prepared by Federal, state, or local government agencies are the primary sources of information regarding present and reasonably foreseeable future actions. Unless otherwise noted, there is no difference in the context or intensity of potential cumulative impacts

between the No Action Alternative, Proposed Action (Dry Fork Station and Hughes Transmission Line), and Alternatives.

5.1 REPRESENTATIVE DEVELOPMENTS IN THE PROJECT AREA

Past projects and land use have obviously affected the characteristics of the region. Representative projects include:

5.1.1 Coal-Fired Power Plants

There are 23 major power facilities in Wyoming seven of which are coal-fired units within 60 miles of the proposed power plant site. Each of these seven plants is a pulverized coal facility and, as such, emits criteria pollutants and other contaminants in amounts regulated by the federal Clean Air Act and the Wyoming Department of Environmental Quality (WDEQ). The total capacity of the existing units is approximately 5,914 MW.

5.1.2 Existing Transmission Lines in Wyoming

A list of existing transmission lines that are in or near the Hughes Transmission Line project area is presented in Table 5.1-1. As shown in the table, there are four segments of existing 230-kV transmission lines near the project area in Wyoming. The proposed Hughes Transmission Line would add approximately 136 miles of 230-kV transmission line.

Table 5.1-1 – Existing Transmission Lines in or Near the Project Study Area

Transmission Line Segment	Voltage	Notes
Hughes to Carr Draw Substation	230-kV	Through Wyodak
Carr Draw to Teckla Substation	230-kV	74 miles; completed November 2005
Carr Draw to Buffalo Substation	230-kV	
Buffalo to Sheridan Substation	230-kV	The 230-kV line continues north and west to the Goose Creek Substation and will interconnect to the substation proposed as part of the Hughes Transmission Line project.
Wyodak to Teckla Substation	230-kV	This 230-kV line runs south from Wyodak to the Reno and Teckla Substations.

5.1.3 Existing Coal Mines and 2004 Production

Table 5.1-2 lists the active coal mines in the Powder River Basin (PRB). The area near Wright, Wyoming, also known as the South PRB, is home to some of the largest coal mines in North America. These mines include the Antelope Mine, Black Thunder Mine, Jacobs Ranch Mine, North Antelope/Rochelle Complex, and North Rochelle Mine. In 2004, the combined production of these five mines was approximately 238.2 million tons, or 60 percent of the total coal production in Wyoming.

Four major coal mines are in the Middle PRB, south of Gillette, Wyoming. These mines include the Cordero-Rojo Mine, the Caballo Mine, the Belle-Ayr Mine, and the Coal Creek Mine. The Coal Creek Mine was inactive during 2004 but was reopened in 2006 to provide coal as a

feedstock to the KFx coal conversion plant. The three active mines in the Middle PRB produced approximately 83.9 million tons of coal in 2004, which represented about 21 percent of Wyoming’s total coal production.

Five coal mines are north of Gillette in an area known as the North PRB. These mines include the Eagle Butte Mine, Buckskin Mine, Rawhide Mine, Wyodak Mine, and Dry Fork Mine. According to the October 2005 Bureau of Land Management (BLM) PRB Coal Review report, the former Clovis Point Mine has been incorporated into the Wyodak and Dry Fork mines. Coal production in the North PRB totaled approximately 59.5 million tons in 2004, or 15 percent of Wyoming’s total production.

Table 5.1-2 – Coal Mines in the Powder River Basin

Coal Mine	Location	2004 Production (Million Tons)
Antelope	Converse County, Wright Area	29.7
Black Thunder	Wright Area	72.2
Jacobs Ranch	Wright Area	38.5
North Antelope Rochelle	Wright Area	82.5
North Rochelle	Wright Area	15.2
Belle-Ayr	South Gillette Area (18 miles southeast of Gillette)	18.7
Caballo	South Gillette Area	26.5
Coal Creek	South Gillette Area	Inactive in 2004
Cordero-Rojo	South Gillette Area	38.7
Buckskin	12 miles north of Gillette	20.3
Dry Fork	North Gillette Area	4.5
Eagle Butte	North Gillette Area	23.0
Rawhide	North Gillette Area	6.9
Wyodak	North Gillette Area	4.8

Source: Energy Information Administration Form EIA-7A, “Coal Production Report,” and/or US Department of Labor, Mine Safety and Health Administration, Form 7000-2, “Quarterly Mine Employment and Coal Production Report.”

5.1.4 Coal Bed Methane Production in the Powder River Basin

Based on the Coal Review report at the end of 2003 there were 14,758 producing coal bed methane (CBM) wells in any area that also includes the Montana portion of the PRB (ENSR 2005) and approximately 2,000 new wells drilled in 2004. Most of the CBM wells are concentrated in the Wyoming portion of the PRB near Gillette. Total CBM production for 2003 was reported to be 346 billion cubic feet.

5.2 REASONABLY FORESEEABLE FUTURE ACTIONS

5.2.1 Planned New Power Plant Projects in the Powder River Basin

To evaluate cumulative impacts, proposed future power plant projects were divided into two groups: 1) those likely to be completed by 2011; and 2) those proposed but likely to be developed after 2011. In addition to the proposed Dry Fork Station, the following projects are considered very likely or moderately likely to be operational by 2011:

- Black Hills Power and Light WYGEN Unit 2 and Unit 3; and
- North American Power Group Two Elk Unit 1.

WYGEN Unit 2 is a 90 MW coal-fired power plant that is presently under construction. The facility, approximately 8 miles east of Gillette, is expected to commence operation in 2007. WYGEN Unit 3 has also received a DEQ Permit to Construct and is expected to commence operation in 2010.

According to the October 2005 PRB Coal Review prepared for the BLM, the North American Power Group has permitted a 250 MW coal-fired power plant (Two Elk Unit 1) at a 40-acre site approximately 15 miles southeast of Reno Junction (near Wright), Wyoming. The project would include a 45 MW gas-fired turbine. The air permit was originally issued in August 2002; however, construction was suspended and the permit was renewed. Construction of the plant could start up as soon as 2008 and it could be operational by 2010.

Table 5.2-1 lists the new power plant units planned to be operational in the PRB by 2011. These facilities represent approximately 1,000 MW of additional coal-fired generating capacity, which is a 19 percent increase over the existing generating capacity.

Table 5.2-1 – Planned New Power Plant Units in the PRB by 2011

Plant Name	Fuel	Owner	Capacity (MW)	Location	Estimated Distance to Dry Fork Site (Miles)
Buffalo 1	Coal/IGCC	Buffalo Power	275	Near Glenrock	100
Dry Fork	Coal	Basin Electric	385	North of Gillette	0
Two Elk 1	Waste Coal	North American Power Group	250 – Coal 45 – Gas	Near Wright	40-60
Wygen 2 & 3	Coal	Black Hills Power	180 combined	8 miles east of Gillette	8

Sources: Energy Information Administration and [http:// psc.state.wy.us/htdocs/subregional/RMATSPotGenAddt.pdf](http://psc.state.wy.us/htdocs/subregional/RMATSPotGenAddt.pdf)

Table 5.2-2 list four additional power plant units proposed in the PRB. Three of these proposed power plants are coal-fired and one is gas-fired. The timing of these projects is uncertain so for the purposes of this analysis they were assumed to be operational after 2011.

5.2.2 Expected Future CBM Production to 2020

According to the Coal Review report, the future of CBM production is highly sensitive to the price of natural gas (ENSR 2005). Based on current forecasts, the number of new CBM wells expected to be drilled annually between 2005 and 2020 ranges from about 2,892 to 3,943. Based on this level of drilling, there are expected to be approximately 30,528 active CBM wells PRB-wide by 2010, 33,890 by 2015, and 31,311 by 2020. Gas production in the Wyoming and Montana PRB study area is projected to increase to approximately 640 billion cubic feet by 2010.

Table 5.2-2 – Possible Additional Power Plant Units in the PRB Beyond 2011

Plant Name	Fuel	Owner	Capacity (MW)	Location	Estimated Distance to Dry Fork Site (Miles)
Middle Bear 1	Coal	North American Power Group	500	Southern PRB	40-60
Middle Bear 2	Coal	North American Power Group	500	Southern PRB	40-60
Two Elk 2	Coal	North American Power Group	Not Specified	Near Wright	40-60
Two Elk 3	Gas	North American Power Group	50	Near Wright	40-60

Sources: Energy Information Administration and <http://psc.state.wy.us/htdocs/subregional/RMATSPotGenAddt.pdf>

5.3 NO ACTION ALTERNATIVE

Under this alternative, the Dry Fork Station would not be constructed at the Dry Fork Mine site. It is assumed that if RUS does not fund the Dry Fork Station, Basin Electric would need to fulfill their power needs by purchasing power on the open power market. In purchasing power from a possible variety of wholesale electricity suppliers in the region, Basin Electric could contribute indirectly and incrementally to both beneficial and adverse cumulative environmental impacts associated with the generation of electricity from various fuel/energy sources, possibly including natural gas, coal, nuclear, hydro, and to a smaller extent, wind and other renewables. Given the existing transmission line constraints, new transmission facilities would still eventually need to be constructed to supply Basin Electric members with suitable power to meet their needs.

5.4 PROPOSED ACTION – DRY FORK STATION

5.4.1 Soils, Geology, and Minerals

Site grading and excavation activities would disturb soil within the Dry Fork Station footprint (120 acres). Disturbance of soils would cause some soil erosion which would contribute incrementally to the cumulative loss of soil in the PRB. However, the loss would be limited to a comparatively small area, and the overall contribution to the cumulative effects on soil resources would be less than significant.

The project would contribute indirectly to the cumulative effects on geology and mineral resources in the PRB. Operation of the Station would indirectly provide long-term benefits to the CBM and coal industry by creating additional need for these resources. Because the project would not preclude exploration and development of existing oil and gas leases, the Dry Fork Mine coal lease, and potential CBM production, it would not contribute to any adverse cumulative effects to mineral resource development in the PRB.

5.4.2 Water Resources

Dry Fork Station design features, such as zero liquid discharge and onsite stormwater protection measures, would ensure that the project would protect against runoff to surface waters. By

implementing best management practices (BMP) and tightly controlling the potential for surface water runoff to occur, the project would not contribute to the existing impairment of surface water quality in the Little Powder River and the PRB. Sedimentation resulting from topsoil and subsoil removal and stockpiling during project construction would be minimized with erosion and sediment control BMPs, thereby eliminating the project's contribution to cumulative downstream effects.

The Wyoming State Engineer has indicated that sufficient groundwater resources are available in the Lance-Fox Hills aquifer to support the proposed water withdrawals for the construction and operation of the proposed Dry Fork Station (WSEO 2005). While a sufficient quantity of water would be available, the project would contribute incrementally to the continued depletion of the Lance-Fox Hills aquifer. However, this resource would be expected to recover locally upon plant shutdown over a medium- to long-term timeframe.

While Dry Fork Station operations would contribute to the reasonably foreseeable cumulative groundwater depletion of the Lance-Fox Hills aquifer, the project's water withdrawals would not contribute to any reasonably foreseeable adverse cumulative effects on groundwater quality. The project's contribution to adverse cumulative effects from groundwater contamination resulting from spills of chemicals, fuels, or lubricants used in the construction, operation, and maintenance of the Station would largely be reduced to less than significant levels by implementing proposed design features and BMPs.

5.4.3 Air Quality

Cumulative air quality impacts resulting from a large number of mobile and stationary sources across a wide geographic domain are a major issue. An adverse cumulative effect on air quality would occur during the Dry Fork Station operational period after projects such as the Two Elk and Wygen Plants in Campbell County become operational, potentially around the same time as the Dry Fork Station. The Station would, therefore, contribute incrementally to a moderate extent toward cumulative impacts related to regional haze, visibility, impairment in Class I areas, mercury dispersion and bioaccumulation, trace metal deposition, and atmospheric greenhouse gas levels.

Operation of the Dry Fork Station would generate greenhouse gas emissions and thus incrementally contribute to global atmospheric levels of these gases. The primary greenhouse gas that would be emitted would be carbon dioxide, and the estimated CO₂ emissions from the station, and comparative levels of national and global greenhouse gases, were presented in Chapter 4. If constructed, the Dry Fork Station, when added to past, present, and reasonably foreseeable future sources of greenhouse gases in the Powder River Basin, would add to cumulative impacts attributed to these sources.

There are no established standards to assess significance of greenhouse gas emissions. The sources that contribute to global climate change are national and international in scope. For the purposes of this EIS, the contribution to cumulative impacts would be considered significant if the difference in constructing or not constructing the Dry Fork Station would make a discernable difference in national or global levels of greenhouse gases and in turn the observed and predicted

effects of increasing levels of these gases. Constructing and operating the proposed Dry Fork Station is considered less than significant.

5.4.4 Acoustic Environment

The reasonably foreseeable actions, expansions to the Rawhide, Eagle Butte, and Dry Fork mines and realignment of SH 59 and US 14/16, would add 5 dBA or less to noise from the Dry Fork Station. Therefore, cumulative impacts would be similar to the direct and indirect impacts from the Dry Fork Station, which are less than significant and would not violate any standards.

5.4.5 Biological Resources

Existing, past and reasonably foreseeable future activities in the PRB that may contribute to cumulative effects on biological resources are described in Sections 5.2 and 5.3 and include:

- An estimated 6,000 miles of overhead power lines have been developed for CBM production in the PRB, and another 5,000 miles are expected with continued development over the next 10 years (Braun et al. 2002);
- From 1997 through 2001, nearly 12,000 CBM wells were brought into production. Approximately 30,000 wells are expected to be developed within the PRB over the next 10 years;
- There are 23 existing power plants in Wyoming, and 8 new plants are planned, which would increase generation capacity for the state by 60 percent. The closest proposed plant is 8 miles from the proposed Dry Fork Station; and
- A total of 14 coal mines currently exist near Gillette.

The increase in CBM and generation development within northeastern Wyoming combined with other projects and population growth have cumulatively reduced the quantity and quality of habitat for the greater sage-grouse, pronghorn, raptors, and many other wildlife species. Future developments would continue to fragment habitat for wildlife; result in permanent reduction in foraging, nesting, and wintering habitats for a number of species; increase avian collisions with associated electric transmission systems; reduce the number of native vegetation communities; increase the spread of noxious weeds, which may adversely affect wildlife habitat quality; potentially lead to greater impacts to federally-listed species; further increase human presence in areas previously undisturbed; increase the risk of poaching due to an increase in human population in this part of Wyoming; lead to potential degradation of wetlands and riparian areas that are important wildlife habitats; and further degrade and remove sagebrush habitats critical to species such as greater sage-grouse, among others. Individually, projects generally have limited, minor to moderate impacts on biological resources. However, the combined effects of these factors cumulatively result in landscape-level adverse effects, such as a reduction in the area and health of sagebrush habitats, on biological resources in northeastern Wyoming.

Construction and operation of the proposed power plant site would have some limited adverse, primarily minor, impacts on biological resources as described in Chapter 4. There would be virtually no impact on wetlands or fisheries, so that the proposed project would not contribute to cumulative loss and degradation of wetlands or fisheries in the PRB. The minor to moderate

adverse effects on vegetation, noxious weeds, wildlife, and special status species from the proposed power plant would represent a minor contribution to cumulative effects on biological resources in the PRB.

5.4.6 Land Resources

Increasing development of mineral resources in the region is increasing the number of jobs available and thus contributing to population growth. Regional population growth could lead to development of land that is currently undisturbed or used for other activities such as ranching and agriculture. The Dry Fork Station could have a minor adverse contribution to the cumulative development of land resources.

5.4.7 Recreation, Wilderness, and Areas of Critical Environmental Concern

The Dry Fork Station is not expected to impact recreation and therefore would not contribute to cumulative effects on recreation.

5.4.8 Visual Resources

The reasonably foreseeable future actions also involve components tall enough to be associated with skylining and components and activities associated with nighttime light or glare. Due to the distances from the Dry Fork Station to any of the reasonably foreseeable future actions, its contribution to long-term cumulative impacts involving skylining and nighttime light or glare would vary in magnitude and extent, depending on viewer location, but would be less than significant.

5.4.9 Transportation

Given the regional trends in population growth and industrial, commercial and residential development, incremental increases in road traffic are likely for the region. However, the Dry Fork Station's contribution to traffic and other transportation-related cumulative effects would be minor.

5.4.10 Cultural Resources

Since the Dry Fork Station would have a less than significant impact on National Register of Historic Places (NRHP)-listed or NRHP-eligible historic properties after implementing mitigations, it would not contribute to cumulative impacts to cultural resources.

5.4.11 Paleontological Resources

Given the minimal likelihood of paleontological resources to exist within the geological formations underlying the area around the Dry Fork Station, its contribution to cumulative impacts on paleontological resources are unlikely to be significant.

5.4.12 Solid Waste and Hazardous Materials

No adverse cumulative effects from solid and hazardous waste would be expected to occur during the Dry Fork Station construction and operational periods. The industrial growth in the PRB expected in the future (including two additional power plants - the Two Elk and Wygen facilities) will generate additional solid and hazardous wastes. The wastes generated from the Dry Fork Station would be a very small percentage of the wastes generated in Wyoming, adding little to the cumulative load of the permitted disposal facilities.

5.4.13 Public Health and Safety

Cumulative impacts on public health and safety are limited to those related to air quality. Several other facilities in the area are major sources of air emissions, and modeling presented in Chapter 4 determined that none of these in combination with the Dry Fork Station would cause exceedances of the NAAQS or other state regulatory requirements. Therefore, cumulative impacts would be less than significant.

5.4.14 Socioeconomics

The Dry Fork Station, combined with other existing and planned projects in the PRB, would generate short-term and long-term opportunities for increases in employment, income, and the tax base. These projects would also result in additional demand on housing, police protection, fire protection, and emergency medical services.

There would be a cumulative increase in the demand for police and fire protection and emergency medical services. It is possible that a housing shortage would occur if the construction of the three plants coincides. It should be noted, however, that these cumulative effects would be short-term and would likely occur only over the duration of construction.

If the other two power plants in the nearby area require a similar type and number of workers to operate as the Dry Fork Station, Campbell County would experience a population increase of 240 persons (0.6 percent). All three plants are expected to be operational within the same timeframe. It is unlikely that the Dry Fork Station, once complete, would have a significant cumulative effect in the project area.

Other power plants are projected to be operational after 2011. The cumulative effect of construction of these plants in combination with the Dry Fork Station would be minor, as area housing for the Dry Fork Station's construction workforce would no longer be required.

5.4.15 Environmental Justice

Since low-income and minority residents in the project area would not be disproportionately impacted by the proposed Dry Fork Station, no cumulative effects on these residents would be expected.

5.5 ALTERNATIVE DRY FORK STATION LOCATION

There is no difference in the context or intensity of potential cumulative impacts between the proposed Dry Fork Station, and those associated with the proposed alternative location for the Dry Fork Station except for the following resource areas.

5.5.1 Soils, Geology, and Minerals

At the alternative location, the Dry Fork Station's contribution to cumulative impacts on soils, geology, and mineral resources would generally be the same as those described for the proposed location. The principal difference between the proposed location and the alternative location is the presence of clinker deposits at the alternative location that are important to the Moyer Springs groundwater recharge zone. Implementing proposed design features and BMPs would reduce the project's contribution to adverse cumulative effects on clinker deposits to less than significant levels.

5.5.2 Biological Resources

The contribution to cumulative effects on biological resources in the PRB from construction and operation of the alternative power plant site would be similar to those described for the proposed power plant site. Construction at the alternative site would involve a greater loss of sagebrush habitat than at the proposed site, but this difference is negligible on a landscape-level cumulative analysis.

5.6 HUGHES TRANSMISSION LINE

The potential cumulative effects are evaluated both for the construction and operation of the Hughes Transmission Line.

5.6.1 Soils, Geology, and Minerals

The primary cumulative disturbance to soils would occur from the placement and construction of transmission line poles. In all likelihood, disturbance would be less than estimated, and the contribution of the proposed transmission line to cumulative soil loss in the PRB, though incremental, would be insignificant (less than 2 acres). The Hughes Transmission Line's contribution to soil contamination resulting from the spill of lubricants, fuels, and chemicals from equipment used to construct, operate, and maintain the transmission line would be insignificant with the implementation of project BMPs.

The Hughes Transmission Line would not contribute to any adverse cumulative effects on the ability to develop existing and reasonably foreseeable minerals leases and CBM exploration and production. Conversely, it would benefit the current and reasonably foreseeable production of oil, gas, and CBM by providing additional and reliable electrical transmission facilities that would stabilize the existing power grid and reduce transmission constraints that affect current or reasonably foreseeable energy exploration and development activities.

5.6.2 Water Resources

Hughes Transmission Line activities would span surface water bodies; therefore, they would not contribute to any cumulative effects from sedimentation and surface runoff. The Hughes Transmission Line would not contribute to any other cumulative effects on surface water quantity and quality in the PRB.

5.6.3 Air Quality

The Hughes Transmission Line, along with reasonably foreseeable future actions, could result in an increase in airborne dust and vehicle emissions. This potential impact would be greatest if multiple projects in close proximity were constructed simultaneously. In the long term, operation of transmission lines generates very little air emissions, so it would not contribute to a cumulative increase in air emissions.

5.6.4 Acoustic Environment

The Hughes Transmission Line, along with reasonably foreseeable future actions, could result in an increase in noise levels during periods when construction projects occur simultaneously. Cumulative noise impacts would be short term and limited to daylight hours. No long-term cumulative noise impacts would occur.

5.6.5 Biological Resources

The proposed transmission line alignment would generally have minor impacts on vegetation and noxious weeds with implementation of BMPs. These impacts would have a minor contribution to the cumulative effects of many projects across the PRB, which combine to result in loss of sagebrush habitat and spread of weeds.

The proposed alignment would have virtually no effect on wetlands or fisheries, so the project would not contribute to wetlands or fisheries resources loss or degradation in the PRB.

Construction and operation of the Hughes Transmission Line would potentially contribute to cumulative impacts on some wildlife and special status species across the PRB. Although the transmission line would be designed to Avian Power Line Interaction Committee standards, some raptors and other birds may be injured or killed due to collision with the transmission lines or electrocution. Transmission structures may benefit some raptor species by providing perch and roost sites. Perch deterrents would be installed in some locations to reduce increased raptor predation of sensitive species such as greater sage-grouse and Columbian sharp-tailed grouse. However, some increase in predation is likely and would have a minor contribution to this type of effect from other transmission lines across the PRB.

Construction and operation of the proposed Hughes Transmission Line is not expected to affect two ESA-listed species, Ute ladies'-tresses orchid and black-footed ferret, so there would be no contribution to cumulative effects on these species. The proposed transmission line could have effects on the bald eagle. Design features, BMPs, and further consultation with USFWS would

likely prevent adverse impacts. However, the project would contribute to numerous threats to the species across the PRB that cumulatively could negatively impact the numbers of occupied bald eagle nests in the project area during the 20 year post-delisting monitoring period.

The alternative transmission line alignment would have the same types of effects on biological resources as the proposed alignment. However, the increased length and thus area of the alternative alignment could result in a slightly greater addition to cumulative effects on vegetation, noxious weeds, wildlife, and special status species than the proposed alignment due to the greater quantity of vegetation and individual animals that could be affected. Because Columbian sharp-tailed grouse was documented in the alternative alignment, the contribution to cumulative effects on this species may be higher with the alternative alignment.

5.6.6 Land Resources

The Hughes Transmission Line could have a moderate adverse contribution to cumulative effects on land resources in the region. When combined with other transmission line projects it would contribute to the trend of increased development in the region and could lead to development of land that is currently undisturbed or used for other activities such as ranching and agriculture.

5.6.7 Recreation, Wilderness, and Areas of Critical Environmental Concern

The Hughes Transmission Line is not expected to impact recreation and therefore would not contribute to cumulative effects on recreation.

5.6.8 Visual Resources

The Hughes Transmission Line's contribution to cumulative impacts on visual resources would be the same for all of the transmission line routes.

The reasonably foreseeable future actions also involve components tall enough (such as transmission line structures) to be associated with skylining. Due to the distances from the proposed transmission line route to the reasonably foreseeable future action structures, cumulative impacts involving skylining are expected to only occur for the middle-ground distance zone. These transmission line structures, when viewed with reasonably foreseeable future action structures, could clutter the middle-ground distance zones with tall structures, creating long-term cumulative impacts involving skylining. The impacts would vary in magnitude and extent, depending on viewer location, but are expected to be less than significant. These impacts could be reduced if, for example, the transmission line structures were co-located within utility corridors, and not in individual corridors.

5.6.9 Transportation

Given the regional trends in population growth and industrial, commercial, and residential development, incremental increases in road traffic are likely for the region. However, the Hughes Transmission Line's contribution to traffic and other transportation-related cumulative effects would be minor.

5.6.10 Cultural Resources

Since the Hughes Transmission Line would have a less than significant impact on NRHP-listed or NRHP-eligible historic properties after implementing mitigations, it would not contribute to cumulative impacts to cultural resources.

5.6.11 Paleontological Resources

Given the minimal likelihood of paleontological resources to exist within the geological formations underlying the area around the Hughes Transmission Line, its contribution to cumulative impacts on paleontological resources are unlikely to be significant.

5.6.12 Solid Waste and Hazardous Materials

There is a potential exposure of the public to hazardous materials due to unintentional releases or spills of hazardous materials used during construction and maintenance of the Hughes Transmission Line and other reasonably foreseeable future actions. These impacts would be reduced to a less than significant level by implementing BMPs and standard operating procedures.

5.6.13 Public Health and Safety

The cumulative impacts to public health and safety could be an increase in background electric and magnetic field exposure to residents in the immediate vicinity of overlapping transmission line projects. The Hughes Transmission Line would not contribute to any long-term cumulative human health impacts.

5.6.14 Socioeconomics

Because construction is expected to be completed by 2008, it is unlikely that the temporary labor force used to construct the Hughes Transmission Line would have a significant cumulative impact when combined with reasonably foreseeable future projects.

5.6.15 Environmental Justice

Since low-income and minority residents in the area of the Hughes Transmission Line would not be disproportionately impacted by the proposed or alternative alignments, no cumulative effects on these residents would be expected.

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The following people were primarily responsible for preparing this document.

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