BEFORE THE PUBLIC UTILITIES COMMISSION OF SOUTH DAKOTA

APPLICATION OF BLACK HILLS POWER, INC. FOR A 230 KV TRANSMISSION LINE AND ASSOCIATED SUBSTATION MODIFICATION FACILITY PERMIT	**)**	**Docket EL 14-____**

Black Hills Power, Inc. ("Black Hills Power" or "Applicant"), a South Dakota corporation, submits this Application to the South Dakota Public Utilities Commission ("Commission") pursuant to S.D.C.L. § 49-41B-11. In particular, Black Hills Power seeks authority from the Commission to construct the South Dakota portion of a 230 kV transmission line, which will run from northeastern Wyoming to the Rapid City area in South Dakota and associated modifications to the Lange Substation in Pennington County, South Dakota. In support, Applicant sets forth the following facts and circumstances justifying the granting of this Application and in satisfaction of the requirements set forth in S.D.C.L. § 49-41B-11; S.D.C.L. § 49-41B-22; A.R.S.D. 20:10:22:06 through 20:10:22:25; and A.R.S.D. 20:10:22:34 through 20:10:22:39.

I. NAME OF OWNER, MANAGER, AND PARTICIPANTS (ARSD 20:10:22:06 and 20:10:22:07).

The Teckla-Osage-Rapid City 230 kV transmission line and associated substation modifications (Project or Facility) are being constructed by Black Hills Power. Black Hills Power's principal place of business is located at 409 Deadwood Ave., Rapid City, South Dakota, 57702. Black Hills Power is a corporation, incorporated on August 27, 1941 under the laws of South Dakota. It is a wholly owned, first tier subsidiary of Black Hills Corporation.

Black Hills Power is a public utility as described in S.D.C.L. Ch. 49-34A and is engaged in the generation, transmission, distribution, purchase and sale of electric power and energy through an interconnected transmission network. Upon completion of construction, Black Hills Power will be the sole owner of the 230 kV transmission line and the Lange Substation modifications. Mark Carda, Black Hills Power's Manager of Electrical Engineering, is the project manager for this Project.

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II. PURPOSE OF THE TRANSMISSION FACILITY (ARSD 20:10:22:08).

The purpose of the Facility is to strengthen and improve the reliability of the regional transmission network. The Project is also necessary to provide additional transmission capacity to meet the growing demand upon the Common Use System transmission system. Further discussion regarding the purpose of the Project is included in Section IV of this Application.

III. ESTIMATED COST OF THE FACILITY (ARSD 20:10:22:09).

The estimated construction cost for the Facility includes costs associated with surveying, engineering, materials, construction, right-of-way, project management, and substation modifications. The estimated construction cost of the total Project is $54 million dollars. The cost associated with the portion of the transmission line that will be constructed in South Dakota is estimated to be approximately $16.6 million for the 230 kV transmission line and approximately $0.78 million for the Lange Substation addition.

IV. DEMAND FOR TRANSMISSION FACILITY (ARSD 20:10:22:10).

Black Hills Power is a joint owner, along with Basin Electric Power Cooperative and Powder River Energy Corporation, of the Common Use System ("CUS") transmission system under the jurisdiction of a FERC-approved Joint Open Access Transmission Tariff ("JOATT"). The CUS transmission system consists primarily of approximately 1,200 miles of 230 kV transmission lines extending from Sheridan, Wyoming to Douglas, Wyoming to Rapid City, South Dakota to Scottsbluff, Nebraska. This system serves an all-time peak combined load of 967 MW in northeast Wyoming, western South Dakota and southeast Montana. A general diagram of the CUS system and neighboring utility interconnections is shown in Figure A below.

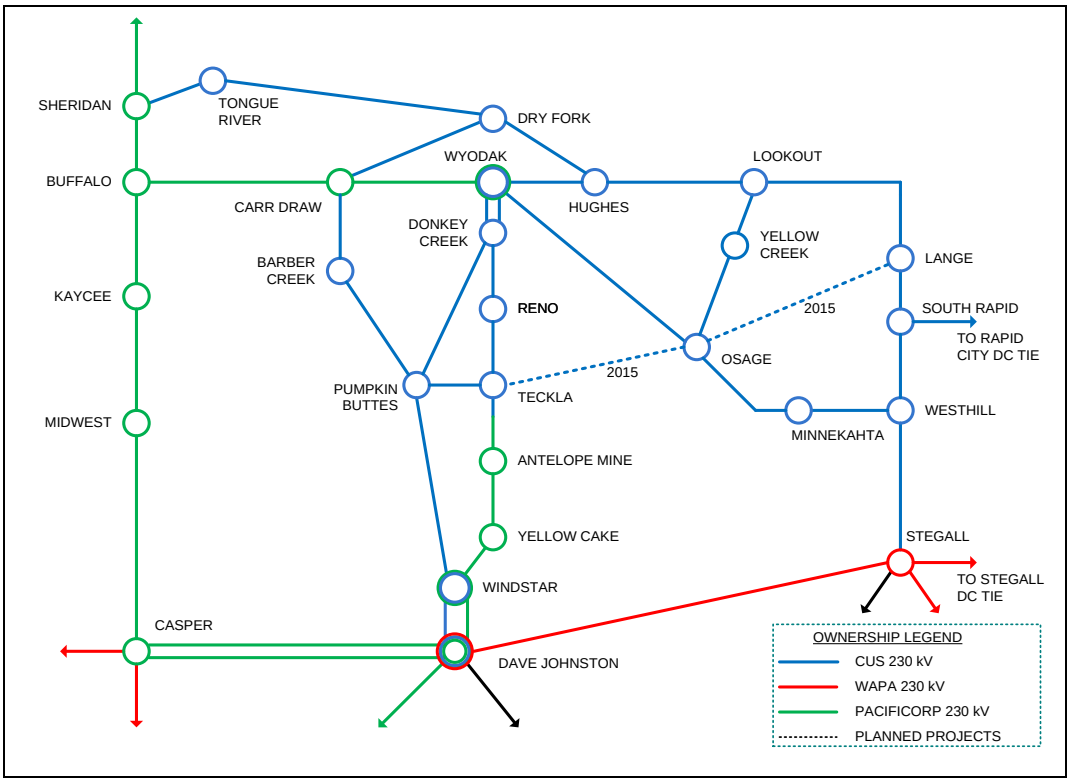

Figure A: CUS and Surrounding Transmission System

a. Strengthen and Improve Transmission System Reliability.

The need for this Facility has been identified and validated through the annual CUS transmission planning process. Long-range transmission planning studies have shown the Facility is necessary to strengthen and improve the reliability of the CUS transmission system and the customer loads that rely on it. The current CUS system serves the Black Hills area via a 230 kV loop supported by three 230 kV transmission lines and the Rapid City DC Tie. In the event that two of the three 230 kV transmission lines supporting the 230 kV Black Hills loop are lost, the Black Hills and Rapid City regions would be connected to the external power grid by a single, weak 230 kV source at Stegall. Black Hills Power would be required to run at least four of its five installed Rapid City generators at maximum capacity to satisfy the CUS load demand and maintain acceptable system voltages under peak demand conditions. The Facility will provide an additional 230 kV transmission path into the Black Hills area, reducing the reliance on Rapid City generation to meet reliability criteria.

A similar situation exists for the Rapid City area. Two 230 kV transmission lines feed into the city at the Lange and South Rapid substations. The loss of both of those lines requires at least three of the five installed generators at maximum capacity to maintain system voltages and avoid overloading the underlying 69 kV system under peak demand conditions. The Facility will provide an additional 230 kV transmission path into the Rapid City area, reducing the reliance on Rapid City generation to meet reliability criteria.

b. Growing Demand on Transmission System.

Based on the 2014 10-year load forecasts provided by the CUS members for the annual transmission planning assessment, the forecasted load growth in the Black Hills area of the CUS over the next 10 years is 1.2%, or 45 MW total. This includes customers served by Black Hills Power as well as the electric cooperatives. Unexpected, large single customer growth is not included in the growth rate. When combined with the native load growth, any large customer additions can significantly impact the performance of the system under the worst-case outage scenarios as described in the previous section.

In addition to the growing load service requirements placed on the transmission system, a transmission customer has requested 130 MW of firm transmission service beginning in 2016 through the JOATT. Currently, there is limited transmission capacity to transfer energy from the Wyodak area to the Rapid City area across the CUS, and the available capacity on the existing CUS 230 kV transmission system will not allow this transmission service commitment to be satisfied. The Facility will provide capacity (in excess of the capacity needed) to meet this transmission service commitment along with supporting additional CUS load growth.

c. Consequences of Delay or Termination of the Construction of the Facility.

The Facility is needed to serve a firm transmission service agreement that begins January 1, 2016. Black Hills Power's obligations under this agreement will not be met if the Project is not permitted and constructed. Additionally, as demand grows on the CUS, the amount of Rapid City generation needed to maintain system reliability for the worst-case outage events mentioned above will exceed the available installed generation capacity. Delays in the implementation of the Facility would limit the amount of load growth that could be served in the future. Alternatively, Project delays could potentially require the reduction of demand to an acceptable level for the aforementioned outage scenarios. The communities that are currently served by Black Hills Power's and the CUS transmission system will not realize benefits from having a more robust electric system if the proposed transmission line is not placed in service.

V. GENERAL SITE DESCRIPTION (ARSD 20:10:22:11).

The South Dakota portion of the Project, for which this Application is made, includes approximately 45.4 miles of transmission line between the Wyoming/South Dakota border and the Lange Substation located in Pennington County near Rapid City, South Dakota. Figure 1 *(Appendix A)* depicts the South Dakota portion of the Project area.

The South Dakota segment is only a portion of the larger Project. The proposed Facility will be approximately 144 miles long and will cross private lands, National Forest Service (NFS) lands, Bureau of Land Management (BLM) lands (in Wyoming), and state lands (in Wyoming). The Facility will connect the Teckla Substation in Campbell County, Wyoming to the Osage Substation in Weston County, Wyoming and the Lange Substation located in Pennington County near Rapid City, South Dakota.

The Project begins at the existing Teckla Substation, approximately 67 miles north of Douglas, Wyoming, and travels west approximately three miles along an existing transmission line route, then north approximately 19 miles. Here it turns east and follows county road and section lines before turning northeast approximately six miles. The route then angles east to parallel a three phase electrical distribution line before heading straight east along section lines to Wyoming State Highway 116 where it parallels highway right-of-way (ROW) north approximately seven miles. At this point, the route generally travels east on section lines to the existing Osage Substation. From the Osage Substation, the proposed Facility travels east and north into South Dakota, using approximately 47 miles of currently unused transmission line ROW which runs near the existing Pactola Substation. The currently unused Black Hills Power ROW has a cleared width of 40 to 50 feet, which will be widened to 100 feet. The route then continues east approximately five and one-half miles and then travels north and east approximately ten miles to terminate at the Lange Substation in Rapid City, South Dakota.

Pending final design, the Project crosses the following jurisdictions:

TABLE 1 LAND OWNERSHIP/JURISDICTION CROSSED BY PROJECT

OWNERSHIP/JURISDICTION	APPROXIMATE MILEAGE
Black Hills National Forest (BHNF)	36.3 miles
Thunder Basin National Grassland (TBNG)	4.7 miles
Bureau of Land Management	2.6 miles
State of Wyoming	10.3 miles
Privately Owned Lands	90.0 miles

In South Dakota, the proposed Facility crosses both private lands and federal lands managed by the BHNF. More specifically, approximately 9.1 miles of the proposed Facility cross private lands and approximately 36.3 miles cross NFS lands.

In addition to construction of the proposed transmission line, Black Hills Power will also modify the existing Osage 230 kV substation to accommodate the two new 230 kV line sections from Teckla to Osage and Osage to Lange. The existing 230 kV, 2000 Amp 4-position ring bus will be expanded to a 6 position ring bus by the addition of two line terminals. This expansion will include the addition of two 230 kV, 2000 Amp power circuit breakers, six 230 kV, 2000 Amp gang operated disconnect switches, six (3 per terminal position) 230 kV Capacitive Coupled Voltage Transformers (CCVT's), and associated line terminal relay, protection, meter, and control equipment. These modifications will occur within the existing fenced area of the Osage substation.

In South Dakota, Black Hills Power will modify the existing Lange 230 kV substation to accommodate one new 230 kV line section from Osage to Lange. The existing 230 kV, 2000 Amp 4-position ring bus will be expanded to a 5-position ring bus by the addition of one line terminal. This expansion will include the addition of one 230 kV, 2000 Amp power circuit breaker, three 230 kV, 2000 Amp gang operated disconnect switches, three 230 kV Capacitive

Coupled Voltage Transformers (CCVT's), and associated line terminal relay, protection, meter, and control equipment. These modifications will occur within the existing fenced area of the Lange substation.

VI. ALTERNATIVE SITES (ARSD 20:10:22:12).

a. Route Identification and Selection Process.

In developing the proposed route, a number of routing options were considered, data was collected, major ground features were evaluated, and agencies and landowners were consulted to identify ways to minimize issues and effects related to implementing the right of way (ROW) and transmission line. The process used in identifying and evaluating alternatives while developing the Project is documented in the Teckla-Osage-Rapid City 230kV Transmission Line Routing Report (January, 2011), and attached as Appendix B. Two potential alternative routes (the Northern and Southern Alternatives) were identified and considered by the Interdisciplinary Team (ID Team) (including Forest Service members) and were eliminated from detailed study as described below. Other potential alternatives identified during scoping are also described below.

b. Alternatives Considered and Selected.

The following summarizes the alternatives to the proposed route that were considered.

i. Northern Alternative.

This alternative was considered by the ID Team as a northerly alternative to the original proposed route and was referred to as "Alternative A" in early public outreach efforts prior to initiation of the National Environmental Policy Act (NEPA) process. This alternative is approximately 143 miles long and generally located north of the Project. From the Teckla Substation, this route is the same as the Project traveling west approximately three miles along an existing transmission line, then north approximately 19 miles. Here it angles northeast for approximately 15 miles. The route then travels east and follows county road and section lines approximately 57 miles to Wyoming State Highway 16 where it parallels highway ROW south3 miles to the Osage Substation. From the Osage Substation, the route travels northeast paralleling an existing transmission line ROW for 26 miles in Wyoming. At this point, the route turns east for approximately 3 miles before crossing the Wyoming/South Dakota border where it continues in an easterly direction, South of the Pennington County line, for approximately 41 miles continuing into the Lange Substation.

The Northern Alternative was eliminated from detailed study because as compared with the Project it:

(1) crossed approximately 15 more acres of Greater Sage-Grouse habitat in Wyoming;

(2) followed no currently unused transmission line ROW (compared with 47 miles of currently unused transmission ROW followed by the proposed route); and

(3) had 12 fewer miles of existing access roads available, so more new access roads would have been required.

ii. Southern Alternative.

This alternative was considered by the ID Team as a southerly alternative to the original proposed route and was referred to as "Alternative C" in early public outreach efforts prior to initiation of the NEPA process. This alternative is 157 miles long and is generally located south of the Project. From the Teckla Substation, this route is the same as the Project traveling west approximately 3 miles along an existing transmission line, then north 19 miles. Here it angles northeast for 15 miles. The route then travels east and follows county road and section lines for approximately 57 miles to Wyoming State Highway 16 where it parallels the highway ROW south for 3 miles to the Osage Substation. From the Osage Substation, the route would travel southeast approximately 7.5 miles paralleling an existing transmission line ROW. At this point, the route continues east and north approximately 50 miles near the Pactola Substation, and then north and east approximately 10 miles to the Lange Substation.

The Southern Alternative was eliminated from detailed study because as compared with the Project it:

(1) was approximately 13 miles longer;

(2) crossed 14 more acres of Greater Sage-Grouse habitat in Wyoming;

(3) crossed 7 more miles of mining operations;

(4) crossed 68 more forested acres;

(5) followed no currently unused transmission line ROW (compared with 47 miles of currently unused transmission ROW followed by the proposed route); and

(6) had 15 fewer miles of existing access roads available, so more new access roads would have been required.

iii. Alternative following existing highways.

An alternative that would follow major highway ROWs was suggested by members of the public during the scoping process. This alternative would be approximately 190 miles long and from the Teckla Substation would follow Wyoming Highway 59 for approximately 49 miles north to I-90 at Gillette, Wyoming. It would then follow I-90 east for approximately 141 miles to Rapid City.

This alternative was eliminated from detailed study because as compared with the Project it:

(1) is approximately 46 miles longer and therefore would result in greater environmental impacts and would be more costly to construct;

(2) would have greater surface disturbance impacts due to the increased route length; and

(3) would require a longer construction period resulting in greater air quality emissions and potential disruptions to the transportation network.

iv. Straight-line alternative between Teckla and Osage.

This alternative was suggested by the public during the scoping process. This routing option would proceed diagonally in a straight line approximately 58 miles from the Teckla Substation to the Osage Substation across the TBNG and private property.

This alternative was not considered for detailed study because as compared with the Project it:

(1) does not take into account other existing uses (such as ranching, recreation, and mining) along this route;

(2) would affect a greater amount of Greater Sage-Grouse habitat in Wyoming and other sensitive resources such as cultural resources, goshawks and other raptors because it does not actively avoid sensitive areas and does not follow or transmission line ROWs; and

(3) would cross a greater amount of undisturbed lands because it does not follow existing roads or unused transmission line ROWs.

v. Alternative following existing transmission lines.

This alternative was suggested by members of the public during the scoping process to follow existing transmission line ROWs.

This alternative was eliminated from detailed study because as compared with the Project it:

(1) would not meet the purpose and need of the Project: By placing multiple transmission lines in the same corridor, the needed system reliability objectives, including the industry standard separation criteria from existing high-voltage transmission lines would not be realized because the possibility of failure of both lines is increased by being collocated.;

(2) would be much longer and therefore would have greater surface disturbance; and

(3) would require a longer construction period resulting in greater air emissions.

c. Proposed Route.

The proposed route is described in Section V of this Application. The route was identified as the preferred alternative in the Draft EIS because it resulted in fewer impacts than the alternative

routes discussed above. In South Dakota, the proposed route was developed to address issues that were identified by agency and public scoping.

VII. ENVIRONMENTAL INFORMATION (ARSD 20:10:22:13).

Sections IX through XV of this Application provide a description of the existing environment at the time of submission of this Application, anticipated changes to the existing environment as a result of construction and operation of the proposed Facility, and irreversible changes that are anticipated to remain beyond the operating lifetime of the Facility. Anticipated impacts from construction, operation, and maintenance for each environmental feature are noted, along with appropriate mitigation steps to be taken by Black Hills Power during construction and operation of the Facility.

Black Hills Power is unaware of any other major industrial facilities under regulation which may have an adverse effect on the environment as a result of their construction or operation in the siting area.

VIII. EFFECT ON PHYSICAL ENVIRONMENT (ARSD 20:10:22:14).

a. Existing Environment.

i. Description of land forms.

The Black Hills are a small, isolated mountain range rising from the Great Plains of North America in western South Dakota and extending into Wyoming, covering an area 125 miles long and 65 miles wide. The Black Hills encompass the Black Hills National Forest, which includes many rugged rock formations, canyons and gulches, open grassland, tumbling streams and deep blue lakes. Many spectacular landforms including towering granite peaks, needles, cliffs and spires dominate the skyline of the Black Hills. The Black Hills are marked by vistas of adjacent prairie and mountains. A relatively small portion of the Project is within the prairie to the east of the Black Hills, which consists of open grasslands located on low rolling hills.

ii. Geological features.

The geology of the Black Hills is complex. A Tertiary mountain-building episode is responsible for the uplift and current topography of the Black Hills region. This uplift was marked by volcanic activity in the northern Black Hills. The southern Black Hills are characterized by Precambrian granite, pegmatite, and metamorphic rocks that comprise the core of the entire Black Hills uplift. This core is rimmed by Paleozoic, Mesozoic, and Cenozoic sedimentary rocks. The stratigraphy of the Black Hills is laid out like a target, as it is an oval dome, with rings of different rock types dipping away from the center.

Figure 2 (*Appendix A)* Geologic Map of the Central Black Hills illustrates the geology of the Project area along with two cross sections. The map and cross sections were created by the U.S. Geological Survey (USGS) in cooperation with South Dakota School of Mines and Technology Foundation. The full map, legend and accompanying report can be found at this location: http://pubs.usgs.gov/sim/2777/.

iii. Economic Deposits.

The primary economic deposit in the Project area is limestone. Limestone deposits are located on private lands near Rapid City, many of which are actively being quarried for industrial use and are shown on Figure 3 *(Appendix A)*. There are no active, commercial mines on Black Hills National Forest property or private properties within the Black Hills National Forest.

iv. Soil Types.

The Natural Resource Conservation Service (NRCS) Soil Survey of the area (NRCS 1990a, 2011) has identified soil associations each with a distinctive pattern of soils, drainage, and topography, and consisting of one or more major soils, and some minor soils. The majority of the analysis area in South Dakota falls within the Stovho-Trebor Association and the Pactola-Rock Outcrop-Virkula Association.

The Stovho-Trebor Association consists of deep and moderately deep, well drained, gently sloping to very steep, silty soils formed in material weathered from limestone and calcareous sandstone on mountains. This association is located on broad ridges, long, smooth side slopes, and wide valleys, and is dissected by a few major drainages. The deep Stovho soils are on the mid and low parts of the landscape. Slopes range from 2 to 40 percent. The moderately deep Trebor soils are on high parts of the landscape and on short, steep side slopes. Slopes range from 6 to 60 percent.

The Pactola-Rock Outcrop-Virkula Association consists of rock outcrop and deep, well drained, gently sloping to very steep, loamy soils formed in material weathered from steeply tilted metamorphic rock on mountains. This association is characterized by ridges, peaks, and canyons. It is highly dissected by drainageways and major streams, which are deeply entrenched. The Pactola soils are on the upper side slopes of the landscape. Slopes range from 6 to 60 percent. The rock outcrop consists of peaks, ledges, and dikes of extremely hard, highly fractured, steeply tilted metamorphic rock. The Virkula soils are on the slightly concave, mid and low side slopes of the landscape. Slopes range from 2 to 35 percent.

v. Seismic Risks.

Seismic risks of the Facility are considered low. The USGS has recorded no earthquakes in the Black Hills of 3.5 magnitude or greater since the year 1900.

b. Potential Impacts.

The Project will have limited impacts on soil resources in South Dakota overall. Potential impacts could involve soil compaction from the traffic of construction equipment; the removal of a portion of the existing topsoil resource from excavation for structure installation and blading for road construction; and erosion from disturbed soils that have not be stabilized. Most of the soils that will be disturbed have a high restoration potential.

c. Mitigation.

The proposed Facility has been routed to minimize impacts to economic deposits. Black Hills Power also has design criteria/mitigation techniques that it will apply as a part of the Project to avoid or reduce impacts to soils and geologic features. In particular, Black Hills Power will adopt Best Management Practices (BMP) and Standard Operating Procedures (SOP) for soil protection. Erosion and sediment control measures will conform to applicable federal and state regulations. In addition, prior to construction, all supervisory construction personnel will be instructed on the protection of ecological resources, including soils. For more specific information regarding mitigation measures that will be undertaken, please refer to the Draft Environmental Impact Study (DEIS) (*Appendix C*). Proper implementation of the design criteria and mitigation measures, as well as compliance with federal and state regulations, will reduce soil and geologic feature impacts to negligible levels.

IX. HYDROLOGY (ARSD 20:10:22:15).

a. Existing Environment.

The Project will cross 62 water courses in South Dakota on public and private lands. There are 49 water course crossings located on BHNF lands and 13 water course crossings located on private land as shown in Table 2.

Table 2 Number of Water Courses Crossed in the Transmission Line ROW in South Dakota

Type Of Water Course	Project		
	BHNF	Private	Total
Perennial streams	2	2	4
Intermittent streams	47	11	58
Total	49	13	62

Of the four perennial streams crossed by the Project, two are on BHNF lands (South Fork Castle Creek and Slate Creek) and two are on private lands (Slate Creek and Rapid Creek). Figure 4 *(Appendix A)* depicts all surface water bodies within the Project area.

Snowmelt, rainfall, and ground water discharge are the main sources of hydrology to streams and rivers in the South Dakota portion of the analysis area. The watersheds in the analysis area receive an average of 21 inches of annual precipitation, with the majority falling in the months of April through September/October. The annual snowfall ranges from 155 inches in the Black Hills to 18 inches in Rapid City. High surface water flows occur in the spring and early summer months, with the melting of the winter snowpack. Heavy rain fall during the spring thaw constitutes a serious flood threat. Flash floods, although restricted in scope, are probably the most numerous and result from locally heavy rainstorms in the spring and summer.

Three major watersheds are located within the analysis area. The Beaver watershed spans both Wyoming and South Dakota. The Rapid and Middle Cheyenne – spring watersheds are exclusive to South Dakota. The water courses associated with these watersheds are tributaries of the Cheyenne River and are part of the Mississippi River watershed via the Cheyenne and Missouri rivers.

There are twelve sub-watersheds crossed by the Project totaling 343,931 acres (USGS n.d.) with all but one located entirely within the BHNF. The major streams and water courses associated with these sub-watersheds are Rapid Creek, Victoria Creek, Newton Fork, Slate Creek, Castle Creek and Horse Creek. The three major lakes/reservoirs in these sub-watersheds are also within the BNHF: Deerfield Lake, Sheridan Lake, and Pactola Reservoir. Three sub-watersheds are located in the Beaver watershed with one located entirely within the BHNF and two partially located in the BHNF in South Dakota and Wyoming and partially located on primarily private lands in Wyoming. Within the analysis area, the only water course associated with these sub-watersheds is Little Bear Run, a perennial tributary of Stockade Beaver Creek in Wyoming.

Groundwater resources were not evaluated because the Project will not use or affect these resources.

Figure 4 *(Appendix A)* shows the surface water drainage patterns. There will be no difference between the pre-construction and post-construction surface water drainage patterns.

The Project will not use either surface water or groundwater supplies as a water source or a direct water discharge site. Aquifers will not be used as a source of potable water supply or process water. The Project will result in no discharge of heated water and no deep well injections. In addition, the Project will not use offsite pipelines or channels for water transmission.

b. Potential Impacts.

All water courses, including associated riparian vegetation, will be spanned by the transmission line. Spanning of water courses will result in negligible long term impacts to surface water resources or surface water quality from implementation of the Project. Soils disturbance during construction of the Project has the potential to impact water quality. Soils disturbance will occur from construction of roads and decking yards, and transmission structure installation. The impacts to surface water hydrology and water quality from disturbance of highly erodible soils will be short term and minor to negligible during construction.

Permanent impacts to municipal, private, and agricultural water users will not occur, and permanent impacts to surface water and ground water will also likely not occur. Impacts to recreational water resources will be minimal and should not impose any restrictions on outdoor recreation water activities. Impacts to water storage, reprocessing, cooling, or deep well injection will not occur, as these uses are limited/not present in the area.

c. Mitigation.

Black Hills Power has design criteria/mitigation techniques that it will apply as a part of the Project to avoid or reduce impacts to hydrology. In particular, Black Hills Power will adopt BMPs and SOPs to protect hydrology. United States Forest Service (USFS) Watershed Conservation Practices for water features and forest plan direction will also be followed. Erosion and sediment control measures will conform to applicable federal and state regulations.

For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*). Proper implementation of these measures and BMPs, as well as compliance with federal and state regulation, will reduce to negligible levels impacts to surface waters and surface water quality.

X. EFFECT ON TERRESTRIAL ECOSYSTEMS (ARSD 10:10:22:16).

a. Existing Environment.

Lands crossed by the Project in South Dakota include portions of the Black Hills Mountain Range. Most of the area is vegetated with upland forests and woodlands that are dominated by ponderosa pine (*Pinus ponderosa*). Other habitats that occur in the analysis area include riparian/wetlands, grasslands, sparse vegetation (e.g., limestone outcrops), and shrublands. The terrain varies from generally steep in the eastern portion, to more flat and undulating in the western portion of the analysis area. The elevation of the Project on NFS lands in South Dakota ranges from 3,369 to 6,854 feet.

All geomorphic regions of the Black Hills are bisected by the Project. These regions are distributed concentrically and include the Central Core (ancient Precambrian granitic and metamorphic rocks), Limestone Plateau (Paleozoic Pahasapa Limestone), Minnekahta Foothills and Plains (broad and rolling foothills), Red Valley (red sandstones and siltstones), and Hogback Rim (sandstones, siltstones, and shales) (Marriott et al. 1999). The geomorphology is a strong factor in determining the vegetation and potentially associated plant and wildlife communities.

i. Flora.

Forests and woodlands include dry coniferous forests and woodlands and mesic coniferous forests and woodlands. Dry coniferous forests and woodlands are dominated by ponderosa pine with bearberry (*Arctostaphylos uva-ursi*), creeping barberry (*Mahonia repens*), poverty oatgrass (*Danthonia spicata*), or little bluestem (*Schizachyrium scoparium*), and non-native species such as smooth brome (*Bromus inermis*) and/or quackgrass (*Elymus repens*). Mesic coniferous forests and woodlands are dominated by ponderosa pine and white spruce (*Picea glauca*) with twinflower (*Linnaea borealis*), common juniper (*Juniperus communis*), quaking aspen (*Populus tremuloides*), Rocky Mountain juniper (*Juniperus scopulorum*), arrowleaf balsam root (*Balsamorhiza sagittata*), chokecherry (*Prunus virginiana*), or western snowberry (*Symphoricarpos occidentalis*). Hardwoods are predominantly characterized by quaking aspen stands (Marriott and Faber-Langendoen 2000; USFS 2009; Owens 2012).

Grasslands include dry mixed-grass prairie, mesic mixed-grass prairie, as well as exotic herbaceous grasslands. Non-native upland grasslands are the most prevalent of this category and are common within 0.5 mile of the Project. Dry mixed-grass prairie is dominated by little bluestem with associates such as green needlegrass (*Nassella viridula*) or non-native Canada bluegrass (*Poa compressa*). Mesic mixed-grass prairie is dominated by western wheatgrass (*Pascopyrum smithii*) with associates such as intermediate wheatgrass (*Thinopyrum intermedium*) and green needlegrass. Most upland grasslands are dominated by non-native species such as Canada bluegrass, smooth brome, timothy, Kentucky bluegrass, or intermediate wheatgrass.

Riparian, wetland, and fen habitat includes Plains riparian forests and shrublands, dry riparian forests and shrublands, high elevation riparian forests and shrublands, and riparian/wet meadows. Dry riparian forests and shrublands, which are the most prevalent of this category, support riparian vegetation, but do not flow water for most of the year. Fens are waterlogged ecosystems with waters rich in mineral nutrients, vegetation rooted in wet peat (partially decomposed plant material), a winter water table at ground-level or above, and are usually dominated by sedges (*Carex* spp.) (Lincoln et al. 1998).

Plains riparian forests and shrublands are dominated by western snowberry or boxelder (*Acer negundo*) with understory associates such as chokecherry, dames rocket (*Hesperis matronalis*), leadplant (*Amorpha canescens*), western snowberry, or goldenrod (*Solidago* spp.). Dry riparian forests and shrublands are dominated by paper birch (*Betula papyrifera*), ironwood (*Ostrya virginiana*), or quaking aspen with understory associates such as western snowberry, chokecherry, or blackberry (*Rubus* spp.). High elevation riparian forests and shrublands are dominated by Bebb willow (*Salix bebbiana*) and understory associates such as beaked sedge (*Carex utriculata*) and various other sedge species. Riparian/wet meadows are dominated by Nebraska sedge (*Carex nebrascensis*), beaked sedge, or the noxious weed species, common tansy (*Tanecetum vulgare*).

Most mesic grasslands in edge habitat adjacent to riparian/wetland/meadows are dominated by non-native species such as Kentucky bluegrass (*Poa pratensis*) or timothy (*Phleum pratense*) with associates such as orchardgrass (*Dactylis glomerata*) or smooth brome.

Less common habitat types include shrublands and agricultural and developed lands. Upland shrublands are dominated by Saskatoon serviceberry (*Amelanchier alnifolia*) with chokecherry. Developed lands include urbanized areas, strip mines, gravel pits, and other developed lands.

Special status species identified as potentially occurring along the Project include those listed as Forest Service Sensitive (Sensitive), BHNF Species of Local Concern (SOLC), and BHNF Target Plant Species. Species are classified as Sensitive when they meet one or more of the following criteria: 1) the species is declining in numbers or occurrences, and evidence indicates that it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend; and/or 2) the species habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend. SOLC are defined as species that do not meet the criteria for sensitive species status but show a decline in only a portion of Region 2, or those that are important components of diversity in a local area. The BHNF Target Plant Species list is used for screening the potential for those species to be added as a BHNF SOLC. These species, along with their habitat requirements, potential habitat occurrence, and whether the species was further analyzed in the Draft Environmental Impact Statement (DEIS) are provided in Figure 5 Special Status Plant Species (*Appendix A*).

There are no federally-listed endangered, threatened, or proposed plant species with the potential to occur along the Project in South Dakota (USFWS 2012c).

ii. Fauna.

Wildlife species which may occupy lands adjacent to the Project are those commonly encountered throughout the Black Hills Mountain Range. As stated above, the vast majority of the Project occurs in ponderosa pine stands, while a smaller portion will occur in open grasslands, white spruce, or hardwoods.

Sensitive breeding areas for wildlife species along the Project include Bald Eagle, Osprey, and Northern Goshawk nesting territories. These nesting territories were identified during field surveys completed by Black Hills Power and were avoided during the routing process to the greatest extent possible. The Project will also cross BHNF mapped big game breeding and winter ranges.

Special status species identified as potentially occurring along the Project include those listed as BHNF Management Indicator Species (MIS), Sensitive, and BHNF SOLC. These species, along with their habitat requirements, potential for occurrence, and whether the species was further analyzed in the DEIS (*Appendix C)* are provided in Figure 6 Special Status Wildlife Species (*Appendix A*).

Based on the U.S. Fish & Wildlife Service South Dakota Ecological Services Office county species distribution lists, four species protected under the Endangered Species Act may occur in Pennington County: Whooping Crane (*Grus americana*), Least Tern (*Sterna antillarum*), Sprague's Pipit (*Anthus spragueii*), and black-footed ferret (*Mustela nigripes*). Whooping Cranes may occur in eastern Pennington County during spring and fall migrations, but would be highly unlikely to occur in the mountainous forested habitats of the BHNF. The Least Tern nests on sand bars of large, braided prairie rivers and may occur in eastern Pennington County. Sprague's Pipit is a small song bird which nests in open prairies and grasslands with little to no tree and shrub cover. No black-footed ferret populations are known to occur on BHNF. Discussions with BHNF biologists have indicated that none of these species are known to occur within the BHNF.

b. Potential Impacts.

Special status plant species individuals and populations will be avoided by the Project. However, some individuals may go undetected during preconstruction surveys. Direct impacts to undetected individuals could include burial, crushing, and uprooting of individuals during structure placement, road construction, and related activities. In addition, herbicide application associated with the Project could inadvertently kill undetected individuals.

The likelihood of directly impacting sensitive plant species is low, based on the lack of occurrence in the Project area. No known locations of plant species of local concern will be impacted by implementation of the Project. However, implementation of the Project could impact populations of twelve Target Plant Species, as identified in Figure 5 (*Appendix A*), that are known to exist within 0.5 miles of the Project.

Implementation of the Project could result in various potential impacts to wildlife. Construction, operation, and maintenance activities have the potential to cause direct injury and mortality to

wildlife species. Individuals could be harmed through collision with moving vehicles or equipment, or by crushing as the result of vehicles and equipment driving over individuals unable to avoid activity. Potential injury or mortalities would not be expected to result in changes to population condition or status of any wildlife sensitive species.

Collision with transmission lines or associated guy-wires could cause direct injury or mortality to species that fly, including bats, birds, and the northern flying squirrel. High mortality rates usually occur in specific localized situations where certain factors create high risk potential, for example where large numbers of birds regularly cross the transmission line between foraging and nesting sites.

Implementation of the Project, including increased human presence and activity, could disturb individuals by causing them to alter or change behaviors and could displace individuals from otherwise suitable habitats. Disturbance effects have the potential to affect several special status wildlife species, particularly nesting raptors, roosting bats and big game species. For other special status wildlife groups and species, disturbance impacts are typically ameliorated by individuals relocating to other suitable and unaffected habitats. Disturbance effects will be most likely during construction when human presence and activity would be the greatest. The potential for and the intensity of disturbance effects will be lower during operation and maintenance activities.

Implementation of the Project could result in the permanent and temporary alteration and removal of habitats that support special status wildlife species. Permanent habitat loss resulting from implementation of the Project can be divided into two categories: 1) areas that will be permanently cleared of all vegetation, such as under structures and permanently improved access roads; and 2) areas where vegetation may be modified, but the land would remain in a vegetated state, such as temporary work areas and access routes. Table 3 provides a summary of estimated potential habitat loss.

TABLE 3 BHNF HABITAT TYPES IMPACTED BY PROJECT

HABITAT TYPE	ACRES WITHIN IMPACT AREA
Developed: Developed, Urban, Strip Mines, Gravel Pit, Reservoirs and Impoundments	3
Hardwoods: Aspen, Birch, Bur Oak, Other	46
Grassland: Grassland, Bluegrass, Exotic Herbaceous, Oatgrass	118
Montane Grasslands	2
Ponderosa Pine	965
Riparian Hardwoods	2
Shrublands	0
White Spruce	20
Total	1,156

Additional details regarding potential impacts to MIS, Sensitive, and SOLC species are summarized in Figure 7 Wildlife, MIS, Sensitive, and SOLC Effects Summary (*Appendix A*).

c. Mitigation.

Black Hills Power has design criteria/mitigation techniques that it will apply as a part of the Project to avoid or reduce impacts to terrestrial ecosystems. In particular, Black Hills Power will adopt BMPs and SOPs to protect the ecosystems. Additionally, mitigation measures developed during the consultation period under Section 7 of the Endangered Species Act (1973) as amended will be adhered to as specified by the USFS, USFWS, and National Oceanic and Atmospheric Administration fisheries. Prior to construction, all supervisory construction personnel will be instructed on the protection of ecological resources. To assist in this effort, the construction contract will address: (a) federal, state, and tribal laws regarding plants and wildlife; (b) the importance of these resources and the purpose and necessity of protecting them; and (c) methods for protecting sensitive resources including specific mitigation measures. Further, a USFS Sensitive Species located after contract or permit issuance will be appropriately managed by active coordination between permittee, contractor, Forest Service line officer, project administrator, and biologist and/or botanist. For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*). Proper implementation of these measures and BMPs, as well as compliance with federal and state regulation, will reduce to negligible levels impacts to terrestrial ecosystems.

With respect to breeding times and migratory pathways, the transmission line will be constructed according to Avian Power Line Interaction Committee (APLIC 2006, 2012) standards to eliminate the risk of electrocution to raptors and other large birds. Prior to construction, active raptor nests will be identified within the analysis area. Nests will be avoided while active. Timing and disturbance buffers will be maintained around identified nests of raptor SOLC and sensitive species using USFWS recommended spatial and temporal buffers for construction related activities (USFWS 2012). The distance may be reduced where forest characteristics or topography reduce the line-of-site distance from the nest, based on site-specific analysis. Similarly, timing and disturbance buffers will be maintained around Bald Eagle winter roost areas, in season. Vegetation clearing will take place outside of the migratory bird nesting season (April 15 – July 31). If vegetation clearing is planned in the nesting season, preconstruction migratory bird nest surveys will preclude the clearing and appropriate nest buffers, to be determined through discussions with USFWS, will be applied. Construction and maintenance activities in Rocky Mountain bighorn sheep lambing areas will also be restricted from April 1 through June 15.

XI. Effect on Aquatic Ecosystems (ARSD 20:10:22:17).

a. Existing Environment.

The most significant water courses in close proximity to the Project in South Dakota are three perennial streams: Boxelder Creek, Rapid Creek, and Spring Creek. There are three major lakes/reservoirs in the sub watersheds in close proximity to the Project: Deerfield Lake, Sheridan Lake, and Pactola Reservoir. These three lakes/reservoirs are all within the BHNF.

Plant species commonly associated with marshes and wet meadows in the Project area include sedges, rushes, grasses (e.g., *Calamagrostis canadensis*, *Carex utriculata*, *Carex nebrascensis*,

and Deschampsia caespitosa). Common plant species along narrow ribbons of wetland adjacent to small streams in montane zones include larkspur (*Delphinium* spp.), monkey-flower (*Mimulus* spp.), monkshood (*Aconitum columbianum*), and groundsel (*Senecio* spp.). Other common riparian-wetland plant species include boxelder (*Acer negundo*), narrow-leaf cottonwood (*Populus angustifolia*), quaking aspen (*Populus tremuloides*), and Bebb willow (*Salix bebbiana*).

Fens are a type of wetland located in the Black Hills region. Fens receive inputs of groundwater and support herbaceous communities dominated by sedges (e.g., *Carex aquatilis* and *C. utriculata*), rushes (*Juncus* spp.), spikerushes (e.g., *Eleocharis acicularis*), and grasses (e.g., *Calamagrostis canadensis*). Some fens support a woody overstory of willow (e.g., *Salix planifolia, S. wolfii*) and dwarf birch (*Betula glandulosa*) (Windell et al. 1986). Fens garner special status because of their unique characteristics and plant species. Fens are known to occur in close proximity to the Project.

Special status plant species which may rely on moist soils or wetlands are described in Section X of this Application. Two special status fish species may occur in lakes and streams within 0.5 miles of the Project. The mountain sucker is a MIS for the BHNF and also listed as a Sensitive species. Mountain suckers inhabit cool, clear mountain streams from three to 12 meters in width. They may also be found in larger rivers, lakes, and reservoirs (USFS 2010). Lake chub is listed as a Sensitive species. Lake chubs are typically found in lakes and streams with cool waters and clean gravel or cobble substrates. In South Dakota, lake chubs are mainly restricted to Deerfield Reservoir (Isaak et al. 2003). Finescale dace, a Sensitive species, has a low likelihood of occurrence along the Project and was not considered for analysis in the DEIS. Finescale dace inhabit pools of boggy headwaters, creeks and small rivers, lakes and ponds, and are often common in beaver ponds usually over silt and near vegetation (USFS 2010). No suitable habitat is present for finescale dace and no previous occurrences were documented within 0.5 miles of the Project.

b. Potential Impacts.

During construction there is a possibility that sediment may reach surface waters as a result of ground disturbance during excavation, grading, and construction traffic. Once the facility is constructed, it will have no impact on surface water quality.

All streams will be spanned by the Project and no in-water work will occur. The Project ROW will cross less than one acre of wetlands for the entire length of the Project in South Dakota. All wetlands will be spanned to the extent practicable. Because the ROW for the Project will only cross less than one acre of wetlands in South Dakota and they would be spanned and not directly affected by access, the direct and indirect impacts to wetlands will be negligible.

Aquatic species associated with clear water may experience temporary habitat degradation beyond the boundaries of the ROW resulting from siltation, if road-improvement and other ground-breaking activities cause erosion and siltation of streams, lakes, and ponds during the construction phase.

c. Mitigation.

Black Hills Power has design criteria/mitigation techniques that it will apply as a part of the Project to avoid or reduce impacts to aquatic ecosystems. In particular, Black Hills Power will adopt BMPs and SOPs to protect these ecosystems. Engineering design, structure spotting (spanning of wetlands), BMPs, Water Conservation Plans (WCP) (USFS 2006), and compliance with regulatory policy will ensure impacts to wetlands will be minimized or eliminated. Additionally, prior to construction, all supervisory construction personnel will be instructed on the protection of aquatic resources. To assist in this effort, the construction contract will address: (a) federal, state, and tribal laws regarding plants and wildlife; (b) the importance of these resources and the purpose and necessity of protecting them; and (c) methods for protecting sensitive resources including specific mitigation measures. For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*). Proper implementation of these measures, as well as compliance with federal and state regulation, will reduce to negligible levels impacts to aquatic ecosystems.

XII. LAND USE (ARSD 20:10:22:18).

This Section describes the Project area's existing land use, noise levels, communication facilities' reception, and aesthetics. This Section also describes the Project's potential impacts on these resources and mitigation measures, which Black Hills Power will implement to avoid and/or minimize impacts on these resources.

a. Current Land Use.

i. Existing Environment.

The South Dakota portion of the Project includes private and public lands. Private land includes commercial, industrial, and residential developments, as well as undeveloped, rural areas. On private land, the proposed Project will primarily cross commercial, industrial, and undeveloped parcels. Public land includes the BHNF, which features campgrounds; lakes for boating, fishing, and swimming; trails for hiking, biking, snowmobiling, and riding ATVs; recreational residences; and land used for timber harvesting and cattle grazing. The BHNF covers most of the land in the South Dakota portion of the Project. On this public land, the proposed Project will primarily use an existing unused transmission line ROW.

Figure 8 (*Appendix A*) illustrates the Project area's existing land uses on private and public lands.

ii. Potential Impacts.

1. Private Land.

The Project will have direct and indirect effects upon uses and management of private and public lands in South Dakota. During construction, activities will disturb soils and vegetation and create associated traffic and noise. Use of the ROW and some adjacent areas will be temporarily restricted.

The Project will have a minimal impact on rural life. The Project's short-term construction activities will increase traffic on local roads and create noise associated with using heavy machinery. However, once construction activities are completed, traffic and noise levels will

return to pre-construction levels. Long-term operation of the proposed Project will not be expected to create hardships for rural residents or adversely impact their rural lifestyles.

Fourteen residences are located within 150 feet of the proposed South Dakota route. Operation and maintenance activities are not expected to impact uses or management of these residences as these activities will occur very infrequently.

The Project will also have a minimal impact on the business of farming. In the Project Area, field observations and a review of aerial photography showed little evidence of active farming operations that the Project would impact. Most private agricultural land in western Pennington County, where the Project would occur, is used for forestry and cattle grazing. The Project's ROW will require tree-clearing in some locations, but the Applicant will minimize tree-clearing to the maximum extent possible. During the Project's construction activities, cattle would be restricted from grazing in the vicinity of the ROW. After construction is completed, grazing in the ROW will be permitted.

Construction may interfere with activities at the Big Bend Presbyterian Church, which is located approximately 600 feet south of the proposed Project, depending on the timing of construction versus activities at the church.

After construction, the potential for development on private land will be restricted within the ROW. No structures could be built within the ROW for safety reasons. Other compatible uses could occur within the ROW.

2. Public Land.

The Project will utilize an existing unused 40-50 foot wide cleared transmission line ROW between the Pactola and Osage Substations. This ROW will be expanded and cleared to a 100-foot width, from the existing 40-50 feet, to accommodate the new higher voltage line. In South Dakota, this ROW covers approximately 31.5 miles. This ROW once accommodated a Black Hills Power 69 kV transmission line that has been removed and Black Hills Power maintains rights to the easement/ROW.

Wildlife foraging habitat and wood production will be impacted by the development of structure work areas, construction yards/staging areas, decking yards, and wire-pulling, tensioning, and splicing sites and the needed access to these areas. Structure work areas will disturb approximately 65 acres of NFS lands. The Project will require one 20-acre construction yard/staging area, which Black Hills Power plans to locate in the western portion of the BHNF, approximately two miles west of Boles Canyon Road. Decking yards will disturb approximately 34 acres, while wire-pulling, tensioning, and splicing sites will disturb approximately 11 acres of NFS lands.

The Project's construction activities and transmission structures may reduce the high scenic integrity that the USFS maintains near developed recreation complexes.

During construction activities, cattle grazing will be restricted in the vicinity of the ROW. After construction is completed, grazing in the ROW will be permitted.

On public land, the Project will have a minimal impact on rural life and the business of farming. Government-owned recreational residences are the only habitable structures on public land in the Project area. Such residences are leased to private individuals, who are allowed to use the residences for a maximum of 180 days per year. The Project's impacts on the recreational residents' lifestyles would be even less than the minimal impacts on permanent residents living on private land. Farming on public land in the Project area includes timber harvesting and cattle grazing. Widening the existing unused ROW to 100 feet will reduce the amount of land available for timber harvesting. However, the amount of land required for the Project's ROW represents a small percentage of the total land available for timber harvesting in the BHNF.

iii. Mitigation.

The following measures will be implemented to minimize impacts to land use and land management:

- If construction activities damage or destroy existing improvements, such improvements will be repaired or restored to their condition prior to disturbance as agreed to by the parties involved.
- Fences and gates will be installed, or repaired and replaced to their original condition, as required by the land management agency or landowner if they are damaged or destroyed. Temporary gates will be installed only with the permission of the land management agency or landowner and will be restored to their original condition following construction.
- All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line.
- Survey markers found in the ROW will be protected. Survey markers include, but are not limited to, Public Land Survey System line and corner markers, other property boundary line and corner markers, bearing trees and posts, and horizontal and vertical geodetic monuments.

For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*).

b. Displacement.

i. Existing Environment.

When ROW acquisitions require using residential, commercial, industrial, institutional, or other structures, the structures are displaced. For the purpose of this Project, Black Hills Power defined a displacement as a structure within the ROW of the proposed Facility. Structures near the proposed ROW were identified through field observations, analysis of high resolution aerial photograph, and comments received during the Project's public meetings.

ii. Potential Impacts.

The Project will not displace any person or home, nor will it displace any other structure.

iii. Mitigation.

Mitigation is not required.

c. Noise.

Noise is generally defined as unwanted sound. Noise can impact the human environment by interfering with speech, interfering with sleep, causing hearing loss, and causing physical or mental stress. Since a person's response to noise is subjective, it can vary from person to person. Noise levels are quantified using units of decibels (dB). Humans typically have reduced hearing sensitivity at low frequencies compared with their response at high frequencies, and the A-weighting of noise levels closely correlates to the frequency response of normal human hearing. By utilizing A-weighted noise levels in a study, a person's response to noise can be assessed. Therefore, audible noise levels are expressed as dB(A). Decibels are logarithmic values, and cannot be combined using normal algebraic addition.

i. Existing Environment.

The primary land uses surrounding the proposed Facility are campgrounds, dispersed recreation areas, fishing areas, lakes, biking trails, etc.

ii. Potential Impacts.

Perry (Perry, 1972) has reported that numerous complaints can be expected if a transmission line audible noise exceeds approximately 59 dB(A) and that few complaints should be expected if audible noise is below 52.5 dB(A). Based on the audible noise complaint experience from Bonneville Power Administration's (BPA) first 500 kV transmission line, Perry developed the sensitivity guidelines shown below in Figure B. Audible noise levels calculated in this study will be compared to the design guideline of 52.5 dBA which is the upper limit for little to no complaints.

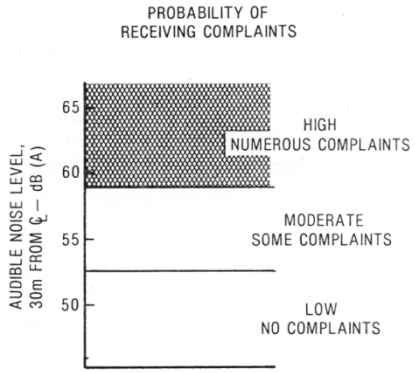

FIGURE B AUDIBLE NOISE COMPLAINT GUIDELINES

Audible noise is measured as an equivalent A-weighted sound-pressure level in decibels (dBA). The L_{50} Audible Noise (Foul Weather) values represent the predicted average noise levels present when foul weather conditions cause the conductors to become wet; these values are what BPA's Corona and Field Effects Program (CAFEP) software reports as a result. The audible noise results from the study are summarized in Table 4.

TABLE 4: L_{50} AUDIBLE NOISE (FOUL WEATHER) RESULTS

STRUCTURE	NORTHERN EDGE OF ROW L_{50} AUDIBLE NOISE [dBA]	SOUTHERN EDGE OF ROW L_{50} AUDIBLE NOISE [DBA]
Wood H-Frame	48.0	48.0
Steel H-Frame	45.0	45.0
Tubular Steel Single Pole	49.0	49.3

Comparing the audible noise results to subjective audible noise complaint guidelines shown in Figure B, all structure designs for the proposed Facility are expected to cause little to no noise complaints.

iii. Mitigation.

Mitigation is not required.

d. Satellite, Cellular, Radio, TV, and GPS Reception.

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. Corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually solves this problem if such a problem exists.

If radio interference from transmission line corona occurs, satisfactory reception from AM radio stations can be restored by appropriate modification of, or addition to, the receiving antenna system. Moreover, AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side.

FM radio receivers usually do not pick up interference from transmission lines because Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band; and the interference rejection properties inherent in FM radio systems make them virtually immune to amplitude-type disturbances.

A two-way mobile radio immediately adjacent to and behind a large metallic structure, such as a steel pole, may experience interference because of signal-blocking effects. Moving either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require moving the mobile unit less than 50 feet.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the proposed transmission line in those areas where good reception is presently obtained, Black Hills Power will inspect and repair loose or damaged hardware on the Project, or take other necessary actions to restore reception, including modifying the receiving antenna systems.

i. Existing Environment.

In the South Dakota portion of the analysis area, there are seven communication towers registered with the Federal Communications Commission (FCC). Table 5 identifies these towers.

TABLE 5 FCC TOWERS IN THE SOUTH DAKOTA PORTION OF THE ANALYSIS AREA

FCC NUMBER	LOCATION	CONSTRUCTION DATE	HEIGHT ABOVE GROUND (FEET)	OWNER
1265672	23080 McCurdy Gulch Road, just east of Pactola Reservoir	1/29/2014	195	New Cingular Wireless PCS, LLC
1271733	16001 Highway 44, just north of Pactola Reservoir	7/2/2012	307	SBA Towers III, LLC
1236832	Near the Interstate 90-Haines Avenue intersection	4/12/2006	190	Black Hills Power and Light Company
1063106	Just northwest of Haines Avenue, exit 190	4/7/1999	190	Rushmore Electric Power Cooperative, Inc.
1041927	Just north of Cabot Hill Road	3/13/1998	141	Western Communications, Inc.
1048502	Cowboy Hill, just north of Founders Park	10/15/2001	535	Rapid Broadcasting DBA KNBN TV
1269270	West side of Rapid City	7/29/2009	98	SWS, LLC

Source: http://www.homefacts.com/fcctowers/South-Dakota/Pennington-County/Rapid-City.html

ii. Potential Impacts.

The proposed Project hardware will be designed and maintained to minimize gap and corona discharges. There is a potential for interference impacts to occur to omnidirectional communication towers. The height of the transmission line may interfere with beam paths.

iii. Mitigation.

If interference occurs, Black Hills Power will work with the communication towers' owners to mitigate the impacts. If interference from corona occurs for an AM radio station that is within the station's primary coverage area and the radio station had good reception before Black Hills Power constructed the proposed Facility, modifying the receiving antenna system can restore satisfactory reception.

Further, on June 12, 2009, the transition to digital TV broadcasts was completed. In most cases, digital reception is more tolerant of "noise" and somewhat less resistant to multipath reflections, that is, reflections from structures, than analog broadcasts. However, if the noise levels or reflections are great enough, they will impact digital TV reception. In the rare instance when the proposed transmission line may cause interference with a TV station's primary coverage area, Black Hills Power will work with the affected viewers to correct the problem at the Applicant's expense.

e. Aesthetics.

i. Existing Environment.

The Black Hills landscape is rich in visual variety. The slopes are primarily covered with evergreen forest, which is dominated by Ponderosa Pine. Aspen cover considerable areas, often along the edges of open areas. Other deciduous trees are found along streams in the area. The tree cover is broken by occasional rock outcrops and gives way to grassy parkland in the valley bottoms, where shrubs such as sagebrush are common. Wildflowers dot the meadows and are scattered along roadsides, adding seasonal color. The most prominent water features in the landscape are two manmade reservoirs, Pactola Reservoir and Deerfield Reservoir. Both reservoirs are bounded by steep forested slopes and open savannah. Streams are also present, winding through the valleys. Cultural and historic features in the landscape include recreation residences on NFS land, residences on private land, commercial facilities such as campgrounds and stores, roads, bridges, existing electrical transmission and distribution lines, and parking areas.

The Black Hills earned their name from the dark appearance of their slopes, due to the dark green color of the Ponderosa Pine. However, large swaths of trees have been killed by mountain pine beetle or are presently infested. The vegetation is undergoing rapid change due to the loss of trees that is highly visible and will impact the scenery of the area. The trees limited visibility from many areas and their loss will result in a reduction of vegetation screening, creating more expansive views and potentially exposing manmade structures and development that were previously hidden from view.

The landscape of the Project area overall exhibits a high level of existing scenic integrity and an established sense of place because the elements that detract from the visual condition are

generally subordinate to the natural elements of the characteristic landscape. The expanses of coniferous forest, groves of aspen, and rolling parklands and savannah do not appear altered. While mountain pine beetle activity is rapidly altering the scenery, it is not a human alteration. Castle Creek has been dammed to create Deerfield Reservoir, and Rapid Creek has been dammed to create Pactola Reservoir. These water bodies add to the picturesque nature of the area, and other than the actual dams, contribute a dominant element of water to the surrounding landscape, enhancing its scenic value.

Cultural or man-made features within the analysis area both add and detract from the existing scenic integrity of the landscape. Linear man-made features include US Highway 385 (US Highway 385), South Dakota Highway 44 (SD Hwy 44), BHNF roads, and existing power lines. Structures on BHNF lands, including campground and picnic area facilities, the Pactola Visitor Center, and other BHNF facilities, and recreation residences, are typically tucked into the forested slopes or perched on the edges of the reservoirs. Structures on BHNF lands are typically constructed with natural finish materials such as stone and wood that are non-reflective and blend into the color palette and texture of the surrounding landscape. These features generally have a neutral effect on the existing scenic integrity.

Residential and commercial development located on private lands is scattered throughout the analysis area. A large concentration is located at the east end of the analysis area, where Rapid City is located. Additional, smaller concentrations are found at Hisega and in the Clinton area. The materials and finishes used for these structures vary. Use of natural, non-reflective materials reduces visual contrast with the color and texture of the surrounding scenery while artificial or reflective materials or contrasting colors increase visual contrast. Many of the developments on private lands are visually dominant due to their location in open clearings where they are highly visible.

ii. Potential Impacts.

Large swaths of trees in the study area have been killed by mountain pine beetle or are presently infested. The vegetation is undergoing rapid change due to the loss of trees that is highly visible and will impact the scenery of the area. The trees limited visibility from many areas and their loss will result in a reduction of vegetation screening, creating more expansive views and potentially exposing the Project in areas that were forested. Thus, while vegetation screening was reviewed during field observation, it is a factor that may fluctuate over time and was not a factor when assessing the visual impacts of the Project.

The majority of the Project alignment will be located on BNHF lands in South Dakota. However, portions that are located on private lands will be seen by large numbers of residences north and west of Rapid City, as well as by smaller numbers of residences elsewhere along the alignment where private lands will be crossed. Impacts to sensitive viewers will vary depending on the visual contrast of the Project, visibility of the Project, and the distance zone where the observation points and corridors will be located.

The visual contrast of the Project will reduce the existing scenic integrity of the landscape of the BHNF. However, the impact to the existing scenic integrity will vary. In particular, near the

Pactola Substation, the proposed Facility will parallel two 69 kV transmission lines that pass through the area. The proposed Facility will also be screened by trees within the Project area, but as indicated above, if screening is reduced over time greater impacts may be realized.

iii. Mitigation.

Black Hills Power will undertake measures to minimize the impact the Facility will have upon existing scenic integrity. To reduce visual contrast in designated areas, poles would be placed so as to avoid impacts to sensitive viewpoints within limits of standard pole design. If the sensitive features cannot be completely avoided, poles will be placed so as to minimize the disturbance by spanning the sensitive area. Similarly, to reduce visual impacts, poles are to be placed at the maximum feasible distance from the crossing of roads or trails within limits of standard tower design. To reduce visual contrast, tree removal within the ROW will be limited to the minimum required area that is necessary to meet National Electric Safety Counsel (NESC) and North American Energy Reliability Standards, to ensure proper clearances and safe operation, and to provide safe access for construction, line inspection and maintenance operations. For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*).

XIII. LOCAL LAND USE CONTROLS (ARSD 20:10:22:19).

Private land use in the two-mile-wide Project analysis area consists of commercial, industrial, and residential developments, as well as undeveloped, forested land. All private lands in South Dakota are located in Pennington County. Pennington County zoning ordinances and land use control policies are set forth in *Appendix D*.

Land use on the private lands in the area generally follows the County Zoning Ordinance designations with commercial developments in the General Commercial District; industrial developments in the Light Industrial District and Heavy Industrial District; and residential developments in the Low Density Residential District. Per Section 316(F)(2)(d) of the County's Zoning Ordinance, and applicable to the districts above, "monopoles or replacement poles that would support utility lines shall be permitted within utility easements or rights-of-way such that the easement or ROW is at least 100 feet wide and that overhead utility transmission structures are at least 80 feet tall."

On private land, the Project's poles will be sited in a 125-foot-wide ROW, compliant with the Pennington County Zoning Ordinance. In the Rapid City area, the Applicant may use tubular steel single poles to reduce the amount of private land disturbed. The tubular steel single poles' heights would be approximately 80-90 feet above ground level.

XIV. WATER QUALITY (ARSD 20:10:22:20).

a. Existing Environment.

The Clean Water Act requires states to release, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The list,

known as the 303(d) list, is based on violations of water quality standards. There are no lakes, reservoirs, or streams on the 303(d) list within the one-mile wide analysis area (0.5 mile on either side of the centerline) for the Project (DENR 2012).

b. Potential Impacts.

Please refer to Section IX of this Application for a summary of the potential impacts to water quality.

c. Mitigation.

Please refer to Section IX of this Application for a summary of the mitigation measures that Black Hills Power will employ to limit the potential impacts the Facility may have upon water quality.

XV. AIR QUALITY (ARSD 20:10:22:21).

Various factors influence the air quality of any region, including the magnitude and distribution of pollutant emissions, the regional climate (including prevailing wind direction), and the local topography. Air quality conditions in rural areas, such as the Project area, often are better than in large urban/industrial centers. Rural areas typically have a smaller number of emission sources and favorable atmospheric dispersion conditions which can result in relatively low air pollutant concentrations.

a. Existing Environment.

The existing air quality in the region is very good. The general Project area outside the Rapid City metro area has limited air pollution emissions sources and good atmospheric dispersion conditions. Fugitive dust particles (particulate emissions) are generated from a variety of sources including wind erosion of disturbed areas that can affect rural and urban areas alike. Types of air pollutant emission sources within the Project area include:

- Carbon monoxide, nitrogen oxides, particulates, sulfur dioxide, and volatile organic compounds;
- Particulate matter (dust) generated by vehicle travel on unpaved graded roads, agricultural activities, and paved road sanding during the winter months; and
- Windblown dust and air pollutants transported from emission sources located outside the Project area.

b. Potential Impacts.

The Project will directly impact air quality within the Project area through increased vehicular traffic during construction. Construction will generate fugitive dust particulates and gaseous tailpipe emissions from construction equipment. Specifically, activities such as construction of new or expanded access roads, pole hole excavation, ROW clearing and wind erosion of

disturbed areas produce fugitive dust. These impacts will be short-term and will end once construction is complete.

No impacts to air quality due to the operation of the proposed Facility are anticipated.

c. Mitigation.

Dust control, monitoring, and reclamation standards required by state and federal permits will be applied during and after construction, which will minimize potentially harmful emissions and particulates and their impacts on visibility in the Project area and surrounding lands. The Project will comply with National Ambient Air Quality Standards (NAAQS) and state standards. USFS Standards and Guidelines also will apply.

XVI. TIME SCHEDULE (ARSD 20:10:22:22).

Black Hills Power proposes that the entire Project located in Pennington County be placed in service in the fourth quarter of 2015. A preliminary permitting and construction schedule for the Facility in South Dakota is provided below:

Submit PUC Route Permit Application…….…….June 2014
ROW Easement Options Acquisition Complete…….Fourth Quarter 2014
Survey……..Fourth Quarter 2014
Final Transmission Line and Substation Connection Design ……..…Fourth Quarter 2014
ROW Easement Acquisition Complete……...December 2014
Applicants Desired PUC Route Permit …….…….January 2015
Construction Start……First Quarter 2015
In-Service Operations……..Fourth Quarter 2015
Final ROW Contacts, Settlements, and Cleanup……..……..First Quarter 2016

This schedule is based on information known as of the date of this filing, and upon planning assumptions that balance the timing of implementation with the availability of crews, materials, and other practical considerations. This schedule may be subject to adjustments and revisions as further information is developed.

XVII. COMMUNITY IMPACT (ARSD 20:10:22:23).

This Section describes the primary community characteristics in and around the Project area and the Project's impacts on socioeconomics, community resources, agriculture, transportation, and cultural resources. Socioeconomic factors analyzed include population, minority and low-income populations, employment and income, and housing. The socioeconomic factors relied on 2010 U. S. Census Bureau data.

a. Socioeconomic and Community Resources.

The analysis area for socioeconomics includes the City of Rapid City and Pennington County in South Dakota.

From 2000 to 2010, populations grew in the South Dakota portion of the analysis area. Rapid City's population grew 14 percent, totaling 67,956 residents, and Pennington County's population also grew 14 percent, totaling 100,948 residents (U.S. Census Bureau 2010).

The demographics of Rapid City's population were also considered. Rapid City's percentages are higher for minority and low-income variables relative to Pennington County and the state. Also in Rapid City, the percentage of families living below the poverty level and the percentage of those under 18 living below the poverty level may indicate low-income populations. In Pennington County, the percentage of those under 18 living below the poverty level may also indicate a low-income population. Neither Rapid City nor Pennington County data cross the threshold that would indicate minority populations.

From 2006 to 2010, the percent of civilians age 16 or older who were employed in the labor force in Rapid City, Pennington County, and the state totaled 63 percent, 64.7 percent, and 65.8 percent, respectively. During this time period, the unemployment rate totaled 7.1 percent in Rapid City, 6 percent in Pennington County, and 4.7 percent in South Dakota (U.S. Census Bureau 2010).

During this same time period, the largest employment industries in Rapid City and Pennington County were educational services, and health care and social assistance at 24.7 percent and 23.2 percent of the labor force; retail trade at 12.9 percent for both geographic areas; and arts, entertainment, and recreation, and accommodation and food services at 11.6 percent and 11.9 percent of the labor force. (U.S. Census Bureau 2010).

In 2010, using inflation-adjusted dollars, the median household income in Rapid City totaled $44,099. In Pennington County and the state, the values totaled $46,849 and $46,369, respectively. In 2010, per capita incomes in the three geographic areas were also similar. Using 2010 inflation-adjusted dollars, the Rapid City per capita income totaled $25,861, with Pennington County totaling $25,894. For the state, the per capita income totaled $24,110. The percentage of persons living below the poverty level ranked highest in Rapid City at 16.3 percent. In Pennington County and the state, the percentages fell to 14 percent and 13.7 percent, respectively (U.S. Census Bureau 2010).

In 2010, the U.S. Census Bureau reported 30,254 housing units in Rapid City and 44,949 housing units in Pennington County. Both figures reflect a 20 percent increase in housing units compared to 2000 Census data. In 2010, the median value of owner-occupied housing units in Rapid City and Pennington County were similar at $147,200 and $149,700, respectively. Both figures reflect a 64 percent increase in value since the 2000 Census.

b. Socioeconomic and Community Resource Impacts and Mitigation.

The proposed Facility will improve the capacity and reliability of the regional electrical system. The Project will help provide redundancy and allow the system to operate if a portion of the

existing transmission system or some of the regional generation sources are out of service. Having a more reliable electrical system will improve the climate for future economic development in the Project area and region. However, the availability of reliable power is only one of several factors needed to facilitate economic development. So, while this Project would improve electrical capacity and reliability, little if any development is expected to be induced directly or indirectly by its implementation.

The proposed Facility is not expected to have significant short or long term impact upon commercial and industrial sectors, housing, land values, labor markets, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities or other community or governmental services.

The proposed Facility is also not expected to have a significant short or long term impact upon population, income, occupational distribution, and integration and cohesion of communities. Black Hills Power expects to employ approximately 50-75 workers for a 12 month time period associated with construction and support services for the Project. Because specific skills are required for construction of electrical transmission lines, it is assumed that 70 percent of the Project's construction workers will be workers who temporarily move to the analysis area from other parts of the north-central United States. The remainder of construction workers would likely include Rapid City residents and others in the analysis area. The Project will have a positive impact upon the local area as a result of increased timber sales and other indirect economic benefits associated with transient workers such as lodging and food sales.

The principal economic effect of the proposed Facility will result from property taxes that Black Hills Power will pay for ROW and improvements in the South Dakota portion of the analysis area. The assessed value of the proposed ROW and improvements has not yet been determined, so it is not possible to project the amount of tax revenues that will accrue to Rapid City or Pennington County or fees that will be paid to the USFS.

The Project will have a negligible effect, if any, on the assessed values of private property and thereby, property taxes. Further, Black Hills Power will compensate private landowners for the Project's impacts on private land.

During construction, operation, and maintenance activities associated with the Project, there is the possibility that improperly using, storing, and/or disposing of hazardous materials (fuels, oils, maintenance fluids) could result in a release that could cause contamination and exposure. Direct effects would include contaminating soil and water resources. Indirect effects would include exposing humans, wildlife, and vegetation to the contamination. Black Hills Power expects to store less than 2,200 pounds of hazardous waste per month which would be under the Resource Conservation and Recovery Act (RCRA) storage limit to qualify as a Conditionally Exempt Small Quantity Generator. This will require Black Hills Power to transport, treat, and dispose of hazardous waste in accordance with state and federal regulations.

Black Hills Power will also implement plans and procedures to minimize the risk of contaminating soil and water resources and the associated exposure to humans, wildlife,

vegetation, and air quality. The Project's design, best management practices (BMPs), and mitigation measures will further minimize the risk of contamination and exposure. Black Hills Power will implement an Environmental Emergency Response Plan and Hazardous Materials Management Plan to minimize risk and contamination and ensure that necessary resources are available to respond to a release.

Additionally, Black Hills Power will implement an Environmental Training and Monitoring Program to communicate environmental concerns and appropriate work practices, including spill prevention, control, and countermeasure protocols to all field personnel. The training program will be consistent with BHP's corporate environmental health and safety policy.

c. Agriculture.

Timber harvesting and cattle grazing are the primary types of agricultural operations occurring in the Project area.

d. Agriculture Impacts and Mitigation.

The Project will have a minimal impact on agriculture. In the Project area, field observations and a review of aerial photography showed little evidence of active farming operations that the Project will impact. Most private agricultural land in western Pennington County, where the Project will occur, is used for forestry and cattle grazing. The Project's ROW will require tree-clearing in some locations, but Black Hills Power will minimize tree-clearing to the maximum extent possible. During the Project's construction activities, cattle will be restricted from grazing in the vicinity of the ROW. After construction is completed, grazing in the ROW will be permitted.

On public land in the BHNF, agricultural operations include timber harvesting and cattle grazing. Widening the existing unused ROW to 100 feet will reduce the amount of land available for timber harvesting. However, the amount of land required for the Project's ROW represents a small percentage of the total land available for timber harvesting in the BHNF. During the Project's construction activities, cattle will be restricted from grazing in the ROW. After construction is completed, grazing in the ROW will be permitted.

e. Transportation.

Transportation within the Project area includes U.S. Highways, State Highways, county highways in Pennington County, South Dakota, unauthorized roads, roads on private lands, and railroads. Figures 9 and 10 *(Appendix A)* depict the major roads within the Project area. Airports in the Project's vicinity in South Dakota include Ellsworth Air Force Base and Rapid City Regional Airport. Ellsworth Air Force Base is located approximately eight miles east of the Lange Substation (the Project's east terminus), and Rapid City Regional Airport is located on SD Highway 44 approximately 11 miles southeast of the Lange Substation.

f. Transportation Impacts and Mitigation.

The proposed Facility will not result in any permanent impacts to the Project area's transportation resources. During construction, indirect effects could include increased traffic volumes along local, state, and federal roads. These effects are expected to be minor as relatively low numbers of workers and equipment will be accessing any one location along the Project ROW at any given time. During operation and maintenance activities, direct effects on transportation and travel management will be minimal. As a result, no mitigation is proposed.

g. Cultural Resources.

i. Existing Environment.

A two-mile-wide study area in South Dakota has been utilized to assess and identify cultural resources in the vicinity of the Project. Field investigation for the Project began on May 27, 2014. No field investigations have yet been completed for this Project. As a consequence, the information reflected in this Section of the Application derives exclusively from a review of existing literature. In the State of South Dakota, 210 separate projects have been conducted within a two-mile corridor centered on the proposed route of the Project. For the South Dakota portion of the Project, approximately 442 acres, or 66%, of the 665 acre (two-mile-wide) study area have been intensively surveyed in the past 20 years. A total of 277 cultural resources have been documented in the State of South Dakota within the two-mile wide study area. Of these, 10 are located on private property. The remaining 267 cultural resources are located on lands administered by the BHNF.

Table 6 enumerates previously identified cultural sites in the study area. Of the 277 resources recorded in the South Dakota study area, 183 represent historic-era components most frequently associated with transportation, Civilian Conservation Corps (CCC) road construction, lumber/timber, and homesteading activities. Other historic-era resources consist of mining-related features (mine shafts, adits, prospecting pits, ditches), trash scatters, cabin remains, structural foundations, railroad grades, road segments, small dams, and lumber-related debris or structures (sawmill, log deck, dumps with saw blades), and a prayer site associated with a Christian church camp.

Table 6 Cultural Resources Previously Identified in South Dakota

Site Type	NRHP Eligible	NRHP Unevaluated	NRHP Not Eligible	Totals
Historic Sites	27	32	124	**183**
Prehistoric Sites	15	21	42	**78**
Multi-component Sites	4	4	6	**14**
Unknown Age	0	1	1	**2**

Totals	**46**	**58**	**173**	**277**

Twenty-seven historic resources have been determined eligible for listing on the National Register of Historic Places (NRHP). Another 32 historic-era resources remain unevaluated for the NRHP. The remaining 124 historic-era resources have been determined not eligible for the NRHP.

The "Historic Sites" category includes 25 architectural resources, including recreational residence properties and bridges. The group also includes the John Johnson House and outbuildings which are included in the NRHP-listed Johnson Siding Historic District. Seven of the architectural resources have been determined eligible for listing on the NRHP with South Dakota State Historic Preservation Office (SHPO) concurrence. Twelve of the architectural resources have been determined not eligible for listing on the NRHP. The NRHP significance of the remaining six structures has not been determined.

Seventy-eight prehistoric sites have been documented within the study area. Prehistoric resources include 60 lithic scatters (21 of which consist of nine or fewer artifacts), one lithic scatter with stone circles, four quarries, one campsite, one habitation site, seven rock shelters with artifacts, one site with three slate-lined depressions, one with a bison skull and flakes, and one consisting of two stone circles. The remaining site did not include an adequate description of site contents.

Fifteen of the 78 prehistoric resources have been determined eligible for the NRHP. Forty-two prehistoric resources have formally been determined not eligible. The NRHP significance of the remaining 21 prehistoric resources has not been determined.

Fourteen of the resources are composed of both prehistoric and historic components (termed multicomponent). Four of the 14 multicomponent sites have been determined eligible for the NRHP. Another four remain unevaluated. The six remaining multicomponent sites have been determined not eligible for the NRHP with SHPO concurrence.

In addition to the historic sites, there are 41 historic and 38 prehistoric isolated finds within the two-mile study area. Historic isolates consist of single cans, small clusters of cans (< 3), pieces of metal, car parts, one resource consisting of two prospect pits and sheet metal, and one resource consisting of five prospect pits and a trash scatter. One historic isolated find consists of a single beer can in association with a projectile point, scraper, and two flakes. All of the historic isolates and the one in association with prehistoric isolates are, by definition, not eligible for the NRHP. The prehistoric isolates consist of eight or fewer flakes and/or individual stone tools.

ii. Potential Impacts.

Cultural resources within the Project ROW may potentially be subject to direct and/or indirect impacts. Direct impacts would result primarily from ground disturbance associated with the construction and maintenance of the Project, substations, staging areas/decking yards, access

roads, and other ancillary facilities. Increased use of existing and new access roads may encourage unauthorized access to historic properties and increase the potential for illegal artifact collection and vandalism of cultural resources.

Indirect effects to cultural resources may result from activities that occur near, but not physically on top of cultural resources. Indirect visual impacts, for example, may occur to some types of NRHP-eligible cultural resources (e.g., Native American sacred sites, historic trails, and certain classes of historic buildings) when modern structures (e.g., transmission towers) are introduced into the viewsheds of these resources.

The introduction of modern structures into the viewshed of a cultural resource may adversely affect the integrity of the historic setting. A cultural resource maintains its integrity of setting if the surrounding landscape has changed very little since the period of importance with which the resource is associated. Setting may include topography, vegetation, simple man-made features, and relationships between buildings, other features, and open spaces. In cases where archaeological sites are considered significant because of the scientific data they contain rather than their setting, they would not be as likely to be adversely affected by visual intrusions.

iii. Mitigation.

Prior to construction, all supervisory construction personnel will be instructed on the significance and protection of cultural resources. Cultural resources training for construction personnel will include: (1) definition of cultural resources and cultural background; (2) how the Project will comply with stipulations in the Programmatic Agreement (PA) in addition to USFS cultural resources protocol; (3) cultural resource regulations associated with this Project; (4) monitoring plan; (5) avoidance and mitigation measures (e.g., environmentally-sensitive areas (ESAs), stop work procedures); and (6) consequences of looting. In the event that potentially significant cultural resources are discovered during construction, potentially destructive work within the area of the find and a designated buffer area will be halted. In addition, Black Hills Power's construction inspector will immediately implement the preservation measures. For more specific information regarding mitigation measures that will be undertaken, please refer to the DEIS (*Appendix C*).

XVIII. EMPLOYMENT ESTIMATES (ARSD 20:10:22:24).

Black Hills Power expects to employ approximately 50-75 workers for 12 months to construct the Project. Because specific skills are required for construction of electrical transmission lines, it is assumed that 70 percent of the Project's construction workers will be workers who temporarily move to the analysis area from other parts of the north-central United States. The remainder of construction workers would likely include Rapid City residents and others in the analysis area.

Black Hills Power anticipates that the Project's construction activities will include the following labor categories and descriptions:

- Land Rights:

    - Experienced land team responsible for working closely with landowners, federal, city and county agencies. Prepare right of entry, access, ROW agreements.
- Surveys:
    - Professional engineering firm with licensed surveyors responsible for land ties, centerline establishment, ROW exhibits, construction staking.
- Timber Operations:
    - Licensed contractor responsible for timber harvest on right of way. Work with private landowners and federal agencies to use best removal practices to minimize impacts on the forest.
- Construction Management:
    - Construction Manager – Responsible for overall Project construction activities, including adhering to Project schedule and budget.
    - Construction Supervisor/Foreman – Responsible for day-to-day Project construction activities.
    - Safety Director/Manager – Responsible for the construction workers' on-site health and safety and ensuring that procedures are in place to ensure the general public's safety in the vicinity of the Project's construction areas. At least once a week, the Safety Director/Manager shall hold construction safety meetings to explain construction activities and risks to human health and safety.
- Construction Coordination:
    - Construction Coordinator/Assistant Manager – Responsible for assisting the Construction Supervisor/Foreman with day-to-day construction activities.
    - Construction Engineer – Responsible for reviewing the Project's engineering plans and requirements and ensuring such plans and requirements are adhered to during construction activities.
    - Environmental Specialists – Responsible for conducting environmental clearance surveys prior to commencing construction activities.
- Construction Labor:
    - Surveyor – Responsible for providing accurate topographic surveys, control points, and staking locations to the Construction Coordinator/Assistant Manager and Construction Engineer.
    - Construction Laborer – Responsible for various tasks, which may include helping to prepare the Project's construction staging area and decking yards, laying out materials, clearing brush and debris from the ROW using mechanical equipment and by hand, revegetating disturbed areas, installing fences and/or gates to prevent unauthorized access to structure work areas and the ROW, and installing BMPs.
    - Explosives/Blasting Laborer – Responsible for preparing sites for blasting and using explosives to excavate sites.
    - Heavy Equipment Operators – Responsible for operating excavators, bulldozers, graders, and dump trucks to construct access roads, and using cranes and cement mixers to frame and assemble the transmission structures.
    - Concrete Laborer – Responsible for preparing and pouring transmission structure foundations.

- Power Line Technician – Responsible for installing and stringing transmission line conductors, ground wires, and shield wires using cable pulling, tensioning, and splicing equipment.
- Truck Driver – Responsible for transporting construction materials to and from raw materials' suppliers and the construction staging area and structure work areas.

Black Hills Power estimates its labor expenditure for construction of the South Dakota portion of the Project will be approximately $8 million.

Construction of the project will provide economic benefits to the region. Local businesses will likely see an increase in revenues from construction of the Facility, and the number of workers hired from within and outside of the project area may result in positive economic gains. The majority of the positions may require specialized skills and expertise. It is possible that positions will be filled by qualified individuals from South Dakota as part of the Project. Contractors are responsible for determining employment needs for construction and will determine estimated employment expenditures during the construction phase of the South Dakota Facility. No permanent or long-term employees are expected to be hired in South Dakota. Indirect benefits will also be created in sectors closely related to the construction industry, lodging, food service, wholesale businesses, retail stores, and others.

After construction is complete, the transient workers will likely leave the analysis area and return home. However, it is possible that some could relocate to the analysis area. If so, the addition of these workers and their dependents would have negligible to minor direct and indirect effects on the analysis area's population and resource supply.

During the first 10 years of the Project's operation, Black Hills Power expects to utilize both internal and external labor to support operations and maintenance. Annual employment costs are estimated to be approximately $80,000.

XIX. FUTURE ADDITIONS AND MODIFICATIONS (ARSD 20:10:22:25).

Black Hills Power is not aware of any system upgrades related to the proposed Facility that will be needed in the future, and present planning studies have not identified any additional modifications that will result from this Facility.

XX. TRANSMISSION FACILITY LAYOUT AND CONSTRUCTION (ARSD 20:10:22:34).

a. Route Clearing.

Much of the Facility's route in South Dakota follows an existing 40 to 50 foot ROW, which will be widened to 100 feet to accommodate the Facility. ROW on private lands will be 125 feet. To maintain National Electric Safety Code (NESC) and North American Energy Reliability Corporation (NERC) reliability standards, the Project ROW will be cleared of vegetation

necessary to construct, operate, and maintain the Facility. Trees outside of the ROW that present a danger to the operation of the Facility will also be removed or cut back. When conductor ground clearance is substantially greater than required code clearance (e.g. where the conductor line crosses a canyon or ravine), trees and shrubs will remain, provided they do not violate minimum clearance requirements. Removal, disposal, tree tops, limbs, and slash will be handled to meet all federal, state, and local ordinances.

b. Transmission Construction Procedures.

Black Hills Power plans to commence construction in early 2015. The yearly construction window for the majority of the work on the Facility will be limited by climate conditions. Most construction activities will likely occur from early spring to late fall.

Construction of the proposed Facility will follow the sequence of: 1) surveying and staking the centerline; 2) identifying and constructing access roads; 3) clearing work access roads as needed; 4) distributing materials along the centerline; 5) installing pole holes and/or foundations, framing and erecting poles; 6) clearing of pulling, tensioning, and splicing sites; 7) installing OPGW ground wire or static wire and phase conductors; and 8) cleaning up and reclaiming the site. Various phases of construction may occur at different locations throughout the construction process. This may require several crews operating at the same time at different locations.

To further explain the above sequence of events, construction survey work for the Facility consists of determining or refining the centerline location through updated electronic and aerial survey techniques, specific pole locations (also called structure spotting), ROW boundaries, construction work area (storage yard, construction yard) boundaries, and in some areas, access to work areas. Centerline and final alignment design and staking will adhere to the conditions outlined in the USFS SUP, BLM ROW grant, and NESC and Black Hills Power policies and specifications.

After surveying and staking is completed, needed environmental clearance surveys would be conducted of all areas where disturbance is planned.

The area where the Facility will be located has many existing trails and roads in the vicinity of the proposed ROW. However, the existing road network may require upgrading in some locations to allow access of construction equipment to the Project ROW. This may involve clearing vegetation, adding additional fill, and overland travel in areas with slopes of less than five percent. Access roads will be developed to the minimum standard that will allow safe use for construction and operation of the Facility. In construction areas where recontouring is not required, disturbance will be limited to overland travel with tracked or rubber tired equipment, where feasible, to minimize changes in the original contours. Large rocks and vegetation may be moved within these areas to allow vehicle access.

Excavation for pole holes for the Facility structures will generally be made with power auger or backhoe equipment. If rocky areas are encountered, pole holes may require drilling and blasting. The poles will be direct embedded or installed on drilled pier concrete foundations to a depth of approximately 10 to 25 feet depending on load and soil characteristics. For guyed structures such as large angle dead ends for H-frame structures, anchor plates for the supporting guys will be buried underground within the ROW.

Pole associated hardware will be shipped to each site by truck or carried by helicopter to sites where access is not permitted. Generally, poles will be assembled and framed at the work area. Areas need to be large enough to accommodate laying down the entire length of the poles while insulators and cross-arms are mounted. Typically, insulators strings and stringing sheaves are then installed at each conductor and ground wire position while the pole is on the ground. Stringing sheaves are used to guide the conductor during the stringing process for attachment onto the insulator strings. The assembled pole will then be erected into place by a crane or line truck.

Conductor splicing will be required at the end of a conductor spool during stringing. The work will occur on work areas for the poles or pulling/tensioning sites. Conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. For public protection during wire installation, temporary guard structures will be erected over roadways, powerlines, structures, and other obstacles where needed as determined during final design. Guard structures will typically consist of single-pole or wood H-frame poles with cross-arms placed on either side of an obstacle. These structures prevent ground wire, conductor, or equipment from falling on an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. Guard structures may not be required for small roads. On such occasions, other safety measures such as barriers, flagmen, or other traffic control will be used. Sites for pulling and tensioning equipment are typically areas approximately 100 feet by 300 feet. These sites will be required approximately every two to four miles.

Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash will be removed from the sites and disposed in an approved manner. Oils and fuels will not be dumped along the Project route. Oils or chemicals will be hauled to an approved site for disposal. No open burning of construction trash will occur.

c. Restoration Procedures.

Upon completion of the construction phase, all work sites will be reclaimed using excess material, approved native vegetation and seed mixtures. The sites will be restored within a reasonable period of time substantially to their original surface conditions. The contractor will remove and dispose of excess soil materials, rock, and other objectionable materials that cannot be used in reclamation work in an approved location.

Disturbed areas, with the exception of existing access roads, will be restored, as nearly as possible, to their original contour and reseeded with landowner/ agency approved native seed mixtures where appropriate. As part of the ROW negotiations, each landowner will identify specific requirements and a list will be created to track. Once construction is completed, each landowner will be contacted to review requirements and determine if requests have been satisfied. All federal, state, and local laws will be complied with.

d. Maintenance Procedures.

Transmission lines are designed to operate for decades and require only moderate maintenance, particularly in the first years of operation. Access to the line is required periodically to perform

inspections, conduct maintenance and repair damage. Generally, the Facility will be inspected by air annually and with a ground inspection once every five years. If problems are identified during inspections, repairs will be performed and the landowner will be contacted prior to work being completed, unless an emergency exists. Vegetation will be removed that would interfere with safe operation of the line and all NERC requirements will be met. Operating and maintenance costs for the Facility are generally the costs associated with inspections.

XXI. INFORMATION CONCERNING TRANSMISSION FACILITIES (ARSD 20:10:22:35).

The Osage to Rapid City 230 kV Facility consists of three single phase conductors, each at the end of a separate insulator string, which are all physically supported by structures. Conductors are stranded cables consisting of multiple strands of steel and aluminum wire wound together. There is also one shield wire, and one fiber optic ground (OPGW) wire strung above the electrical phases to prevent damage from lightning strikes. The shield and OPGW wires are typically less than one inch in diameter. The OPGW wire will also include fiber optic cable that allows a path for substation protection equipment to communicate between terminals on the Project. There are two different types of structures used for the Project, including single steel pole structures and wood H-frame structures. The Project will be constructed within an easement area, the width of which is typically 100 to 125 feet.

In addition to the Facility line construction, Black Hills Power will modify the existing Lange 230 kV substation to accommodate one new 230 kV line section from Osage to Lange. The existing 230 kV, 2000 Amp 4-position ring bus will be expanded to a 5-position ring bus by the addition of one line terminal. This expansion will include the addition of one 230 kV, 2000 Amp power circuit breaker, three 230 kV, 2000 Amp gang operated disconnect switches, three 230 kV Capacitive Coupled Voltage Transformers (CCVT's), and associated line terminal relay, protection, meter, and control equipment.

a. Configuration of Poles.

The basic structure type selected for the Facility will be wood H-frame, with 80-foot class two poles carrying a single circuit. Six individual configurations will be used consisting of tangent, light angle, medium angle, heavy angle, deadend angle and terminal structures. All angle and terminal structures will be three-pole-guyed structures. In some sections, steel single pole structures will be used with average height of 90 feet. Poles will be weathering steel and direct embedded or placed on concrete foundations. Strength of all structures will meet or exceed requirements set forth in the National Electrical Safety Code (NESC) 2012 Edition. Typical pole configurations are shown in Figure 11 (*Appendix A*).

The average span between structures will be approximately 800 feet. Design ground clearance will be at least 30 feet. ROW width will be 100 feet on NFS lands and 125 feet on private lands, except at angles in the Project where greater width is required for anchors.

b. Conductor Configuration.

Each phase will consist of a single conductor. The conductor selected will be 1272 ACSR 45/7 stranding, code name Bittern. Each conductor will be 1.345 inches in diameter and will weigh 1.434 pounds per foot, with ultimate breaking strength of 34,500 pounds. The shield wire will be 3/8 inch seven strand extra high strength (EHS) galvanized steel. The shield wire will be 0.360 inches in diameter and will weigh 0.273 pounds per foot, with ultimate breaking strength of 15,400 pounds. In addition, a fiber optic ground wire (OPGW) will be installed and consist of a 48 fiber with a diameter of 0.443 inches and will weigh 0.292 pounds per foot, with ultimate breaking strength of 15,919 pounds.

The insulator which supports the conductor on the tangent structure will consist of single suspension strings with 12 units per phase and 20,000 pound rated strength. The angle and dead-end assemblies will consist of strings of 14 units per phase and 30,000 pound rated strength. The insulator units will be 5.75 inches high and 10 inches in diameter and constructed of glazed porcelain. Insulators will be brown or gray depending on availability.

c. Proposed Transmission Site and Major Alternatives.

The proposed Facility is discussed in Section V and shown in Figure 1 (*Appendix A*). Section VI outlines the route selection process.

d. Reliability and Safety.

i. Transmission Line Reliability.

The Facility will be maintained to meet NERC and NESC minimum transmission system performance requirements. Black Hills Power will be responsible for maintaining the transmission system by monitoring, testing, and repairing the line and terminal equipment. Typical maintenance activities include: periodic routine aerial inspections with emergency aerial inspections after storms, periodic ground inspections, planned wood pole inspections/testing, and routine inspection and repairs to items identified during patrol and inspections. In addition, a planned vegetation management program will be followed, and requirements of NERC FAC-003-3 will be maintained. All substation equipment maintenance will meet the necessary test and maintenance criteria set forth in NERC reliability standards.

ii. Safety.

The Facility will be designed to meet local, state, and NESC standards regarding strength, clearance to ground, clearance to crossing utilities, clearance to buildings, and ROW widths. The proposed Facility will be equipped with protective devices to safeguard the public from the Facility if an accident were to occur. The protective devices are breakers and relays located where the Facility connects to the substation. The protective equipment will de-energize the Facility should such an event occur. In addition, all substation equipment is secured within a fence and access is limited to authorized personnel.

iii. Electric and Magnetic Fields.

Research related to possible adverse health effects from Electric and Magnetic Fields (EMF) exposure has been in progress for more than 30 years. In 1992, the U.S. Congress directed the National Institute of Environmental Health Sciences (NIEHS) to direct the EMF Research and Public Information Dissemination Program. The goal was to provide evidence to clarify potential health risks from EMF exposure. There are no standards established for safe levels of exposure to EMF and to date, evidence suggesting that EMF exposure cause health risks is weak.

iv. Stray Voltage.

"Stray Voltage" is a voltage resulting from the normal delivery and/or use of electricity that may be present between two conductive surfaces that can be simultaneously contacted by the general public. Stray voltage is caused by primary or secondary return circuits and power systems. Such issues are common to distribution lines and not to transmission lines. Transmission lines are not used in normal delivery to business or residences. Transmission lines can cause induced voltage when long conductors parallel transmission or distribution lines. Measures will be taken to address induced voltage issues with this Facility on a case by case basis.

v. Farming Operations, Vehicle Use, and Metal Buildings Near Power Lines.

The line is designed to allow normal farming and ranching operations, and any restrictions would be set by the National Electric Safety Code (NESC) for clearance and public safety.

e. Right-of-Way or Condemnation Requirements.

As of the filing date of this Application, Black Hills Power has not taken steps to condemn property in South Dakota for this Project. If Black Hills Power determines condemnation to be necessary, it will follow the procedures outlined in South Dakota Statutes.

f. Necessary Clearing Activities.

The ROW for the proposed Facility will be 100 feet wide on federal lands (50 feet each side of centerline), and 125 feet wide on private lands (62.5 feet each side of centerline). In forested areas, the entire ROW will be cleared of trees tall enough to endanger the Facility. Therefore, in forested environments, due to the removal of trees, there will be greater changes in vegetation structure and composition than in non-forested environments. When conductor ground clearance is substantially greater than required code clearance (e.g., where the conductor line crosses a canyon or ravine), trees and shrubs will remain, provided they do not violate minimum clearance requirements. Timber removal within the Black Hills National Forest will follow required Timber Management practices, and on private lands individual needs will be addressed (timber usage, removal, etc.).

g. Underground Transmission.

No portion of the Facility will be undergrounded. Because of the significantly greater expense associated with underground transmission construction, the use of underground technology is

limited to locations where the impacts of overhead construction are completely unacceptable or where physical circumstances allow for no other option. The Applicant concluded that the environmental and land use setting does not warrant underground construction on any portion of the Facility.

XXII. ADDITIONAL INFORMATION IN APPLICATION (ARSD 20:10:22:36).

Black Hills Power believes that this Application, including appendices, contains all the information required to meet its burden of proof as set forth in S.D.C.L. § 49-41B-22. Black Hills Power has also provided correspondence and meeting notes pertinent to the Project in *Appendix E*, which outline the coordination efforts taken with the State of South Dakota and federal agencies to date.

XXIII. TESTIMONY AND EXHIBITS (ARSD 20:10:22:39).

The following witnesses will provide testimony in support of this Application:

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The following appendices are filed in support of this Application:

Appendix A which includes:

Figure 1:	Project Location
Figure 2:	Geologic Map of the Central Black Hills
Figure 3:	Geologic Map Units
Figure 4:	Surface Water

XXIV. REFERENCES.

a. Text and Data References.

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XXV. CONCLUSION.

Black Hills Power contends that the information contained in this Application satisfies its burden of proof as set forth in S.D.C.L.§ 49-41B-22. In particular, Black Hills Power has demonstrated the proposed facility will comply with all applicable laws and rules; it will not pose a threat of serious injury to the environment or to the inhabitants of the citing area; it will not substantially impair the health, safety, or welfare of the inhabitants; and it will not unduly interfere with the orderly development of the region. As a result, Black Hills Power respectfully requests the Commission grant this Application for a Transmission Line Facility Permit.

Dated this 27 day of June, 2014.

BLACK HILLS POWER, INC.

By: _____
Ivan Vancas
Vice President of Operations Services

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF WYOMING

* * * * *

STATE OF SOUTH DAKOTA)
COUNTY OF PENNINGTON) SS:

I, Ivan Vancas, being duly sworn, do hereby depose and say that I am Vice President of Operations Services for Black Hills Power, Inc., Applicant in the foregoing Application; that I have read such Application; and that the facts set forth therein are true and correct to the best of my knowledge, information, and belief.

_____
Ivan Vancas
Vice President of Operations Services

Subscribed and sworn to before me this 27th day of June, 2014.

_____
Notary Public
Commission Expires: 10-5-2015

(SEAL)