

## EXECUTIVE SUMMARY

### PROPOSED FEDERAL ACTIONS

In response to a request from Basin Electric Power Cooperative (Basin Electric or Applicant), Western Area Power Administration (Western) proposes to provide interconnection services at its White Substation for the Deer Creek Station proposed Project, a proposed 300-megawatt (MW) natural gas-fired generation facility in Brookings County, South Dakota. If Western decided to approve the interconnection request, it would add a transformer bay to the White Substation and make other minor system modifications within the substation.

In response to a separate request from Basin Electric, Rural Utilities Service (RUS) proposes to provide financial assistance to Basin for Deer Creek Station construction. The financial assistance would consist of a loan or loan guarantee.

The two requests to Federal agencies trigger environmental reviews under the National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347). In accordance with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) parts 1500 to 1508), Western has agreed to be the lead agency and RUS has agreed to participate in Western's NEPA review as a cooperating agency. The cooperating agency provisions of NEPA are an efficiency measure that allows the production of one environmental document to serve the decision-making needs of both agencies. Western and RUS prepared this Environmental Impact Statement (EIS) to describe the environmental effects of the Federal and non-Federal actions that would occur if the interconnection and financing actions were to take place.

### APPLICANT'S PROPOSED PROJECT

Basin Electric proposes to construct, own, and operate a 300-MW natural gas-fired combined-cycle generation project at a site near White, South Dakota. White Site 1, the Applicant's preferred site, is located six miles southeast of White on 484th Avenue between US Route 14 and South Dakota Route 30 (SD 30). The proposed Project would use combined-cycle technology, in which a gas turbine powers an electric generator. Under the combined-cycle configuration, the exhaust from the combustion turbine generator (CTG) passes through a heat recovery steam generator (HRSG) that extracts heat from the turbine exhaust. This waste heat is used to generate steam that then passes through a steam turbine generator. The recovery of waste heat increases the efficiency of the unit. The footprint of the power generation facility would take up 40 acres of a 100-acre site.

To provide natural gas for the Deer Creek Station facility, a 13.2-mile natural gas line with a right-of-way (ROW) of 75 feet would be constructed northward from the site to access the Northern Border Pipeline (NBPL) in Deuel County, South Dakota. Electricity generated by the facility would be transmitted south of the site to Western's 345-kV White Substation by a 0.75-mile, 345-kV transmission line. Cooling water would be provided by a well site located near Deer Creek, and the water would be transmitted northward to the site by a 1.25-mile, 60-foot wide ROW width, water pipeline. A road to the east of the proposed plant, 484<sup>th</sup> Street, would be paved for approximately one mile to accommodate construction and operational traffic.

### **WHY IS THE ACTION NEEDED?**

Western is required to respond to an applicant's interconnection request by Federal Energy Regulatory Commission (FERC) orders, which ensure non-discriminatory transmission system access. These FERC orders implement Section 211 of the Federal Power Act, which requires that transmission service be provided upon request if transmission capacity is available. Under Western's Open Access Transmission Service Tariff (Tariff), which implements these FERC orders, Western must ensure that system reliability and service to existing customers is not adversely affected by new interconnections. If the proposed interconnection is compatible with all requirements, Western must approve the interconnection request, subject to NEPA review.

RUS provides financial assistance to rural utilities to upgrade, expand, maintain and replace electric infrastructure in rural areas such as Basin Electric's service territory. Before providing financing, RUS determines that the proposed Project is feasible from both an engineering and financial perspective. Under the authority of the Rural Electrification Act of 1936, RUS makes direct loans and loan guarantees to electric utilities to serve customers in rural areas.

In 2007, Basin Electric developed a Power Supply Analysis (PSA) to assess projected needs of its members (Basin Electric 2007). The PSA indicated that additional intermediate capacity would be needed by mid-2012 to meet its members' growing energy demand. Based on the PSA, a 700 to 800 MW capacity deficit is projected in the eastern portion of Basin Electric's service area by the year 2014. Basin Electric is proposing to meet this increased demand by implementing a resource expansion plan that includes 200 MW of peaking generation, 300 MW of wind generation, 250 MW of intermediate generation, and 600 MW of baseload generation. The Deer Creek Station proposed Project is a means to meet the additional intermediate power supply needs in the area. Intermediate capacity units are designed to be cycled at low load periods, such as evenings and weekends. The units can be cycled up and down rapidly to handle the load swings of the system. The proposed Project has been sized for 300 MW in

order to meet the 250 MW intermediate power supply need and have a 50 MW reserve to meet peak intermediate needs. An advantage of using intermediate generation is that wind generation on the grid in the same area can be integrated with the combined-cycle natural gas generation. During periods of high wind generation, gas-fired generation can be reduced. During periods of low wind generation, the gas-fired generation will be available to back up the wind generation.

## **PUBLIC AND AGENCY ISSUES**

A notice of intent to prepare an EIS and to conduct scoping meetings was published on February 6, 2009, in the *Federal Register*. An open house public meeting was held in White, South Dakota on February 24, 2009. There were 59 attendees at the scoping meeting. In addition, Federal, State, and local agencies and interested parties were notified of the proposed Project by letter from Western. The period to receive written comments was open until April 7, 2009. As a result of the scoping process, 14 comments were received from 12 agencies and two individuals. Concerns noted in the comments included local traffic impacts from construction and operation, dust issues from heavy traffic, impacts to air quality, groundwater and Well Head Protection Areas, wetlands, impacts to endangered species and the bald eagle, impacts to birds from transmission lines, and economic benefits to local communities.

## **ALTERNATIVES FOR INTERMEDIATE POWER SUPPLY NEEDS**

In order to meet intermediate power supply needs, Basin Electric considered several power supply alternatives for intermediate needs. These included demand side management (DSM), renewable energy resources, fossil fuels, repowering and uprating of existing facilities, and power purchase contracts.

DSM actions are actions taken on the customer's side of the meter to change the amount or timing of energy consumption. Basin Electric currently has 6 to 10 megawatt (MW) of DSM available to reduce power usage during peak periods. Even if this could be greatly expanded, it would not be enough to meet all intermediate power needs.

As indicated above, wind is a renewable energy resource that would integrate well with a natural gas intermediate facility because the gas can be quickly brought on-line during periods of low wind generation. Solar energy and new hydroelectric power are other intermediate power resources, but they are very costly and additional hydroelectric power is not available in the upper Midwest. Other renewable energy resources such as geothermal and biomass are more suitable to baseload applications. High temperature geothermal resources suitable for power production are not available in eastern South Dakota.

Basin Electric screened five potential sites within its eastern South Dakota service area for development of an intermediate capacity facility. Screening criteria used included access to a high-voltage transmission system with available capacity, natural gas fuel supply, water supply, existing land use and terrain, and proximity to residences. The sites considered suitable were near Aberdeen (Groton site), Watertown (one site), and Brookings (three sites). Based on a field review of the five sites, Groton was rejected because of transmission constraints and the previous installation of two simple-cycle peaking facilities. Watertown was rejected due to distances to the nearest substation. White Site 3 was determined to be too small for a combined-cycle combustion turbine facility. The proposed facility at White Site 1 is described above.

White Site 2 has been evaluated as an alternative in this EIS. A facility at White Site 2 would be located north of SD 30 and four miles northeast of White, South Dakota on 482nd Avenue. Its footprint of 40 acres on a 100-acre site would be similar to White Site 1; however, an additional six acres of the site would be needed for a substation. To provide natural gas for the White Site 2 facility, a 10-mile natural gas line would be constructed northward from the site along 481st Avenue to access the NBPL in Deuel County, South Dakota. Electricity generated by the facility would be transmitted east of the site from the new substation to the Western Split Rock to White 345-kV transmission line located 0.5 miles east of the site. Cooling water would be provided by municipal water supply. A water line extension of one mile would be constructed along 202nd Street from 481st Avenue east to the site.

Repowering and uprating of existing intermediate generating units was also an option considered. Repowering and uprating has been underway at the Laramie River Station, a project owned by Basin Electric and other utilities. Each of the three units at Laramie River Station has achieved 12- MW uprates due to upgrades. In addition, the Leland Olds Station has also been uprated by 5.5 MW. While these upgrades have increased the intermediate capacity, the scale of these past improvements, suggests that uprates and repowering alone would not alleviate the need for intermediate resources provided by the proposed combined-cycle facility.

Power purchase from facilities within the region or outside the region was another option evaluated. Basin Electric has negotiated a power purchase agreement with Recovered Energy Generation (REG) power plants for 22 MW, but has determined that other power purchase options were more expensive than Basin Electric's self-build options. In addition, many other options would require the construction of additional transmission.

Based on the power supply options analysis and the screening conducted by Basin Electric, Western, and RUS decided that White Sites 1 and 2 and the No Action Alternative would be selected for evaluation in this EIS.

## **COMPARISON OF ALTERNATIVES**

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system and RUS would not award a loan or loan guarantee to finance the construction and operation of the proposed Project. Given the lack of a Western interconnection and RUS funding, Basin Electric would not likely construct the proposed Project as described in this EIS. As Basin Electric is a regulated utility having load growth responsibility, it is reasonable to expect that it would construct a similar generation facility elsewhere in eastern South Dakota. Such a facility may not connect to a Federal transmission system, involve Federal financing, or have any other Federal nexus and, therefore, would not initiate a NEPA process. If Western were not to approve the interconnection agreement and RUS were not to award a loan or loan guarantee, the environmental impacts associated with the construction and operation of the proposed Project at this location would not occur. Basin Electric would have to find an alternate means to increase the intermediate generation demand for electric power in the eastern portion of its service area through some other project proposal, which could result in environmental impacts similar to, or greatly different from, those identified for the proposed Project.

Construction at either White Site 1 or White Site 2 would likely have similar impacts to the natural and socioeconomic resources. The terrain of White Site 1 allows for better drainage than White Site 2. White Site 1 is also further away from the nearest occupied residence (1 mile compared to 0.5 mile). However, White Site 1 would require a longer natural gas pipeline. In addition, water supply wells would be constructed in the floodplain of Deer Creek in order to provide cooling water to White Site 1. White Site 2 would have a greater facility footprint, due to the need to construct a substation, and would be more visible to travelers and residents of the area because it is close to SD 30. Table ES-1 summarizes and compares the environmental impacts as described in this EIS. Standard mitigation measures to be used by Basin Electric for the proposed Project are provided in Appendix F.

**Table ES-1: Summary of Potential Impacts of Deer Creek Station**

<b>Resource</b>	<b>White Site 1</b>	<b>White Site 2</b>	<b>No Action Alternative</b>
Air	Increase in emissions during construction from vehicles and equipment would be minimal for carbon monoxide (CO), nitrogen oxide (NO <sub>x</sub> ), and volatile organic compounds (VOC); particulates (dust) from site preparation and traffic on unpaved roads; all construction and operation emissions meet regulations; <i>de minimis</i> emissions of hazardous air pollutants (HAP); largest potential HAP is formaldehyde at 4.5 tons per year (tpy)		No impact
Greenhouse Gas (GHG) Emissions	Not a major source of GHG emissions; estimated carbon dioxide (CO <sub>2</sub> ) emissions three one thousandths of one percent (0.00003) of global man-made emissions		No impact
Geology, Soils and Farmland	No unique geologic features; prime farmland impacts of 40 acres of the 100-acre facility site (40 acres of permanent impact and 60 acres still available for hay or pasture); loss of 1 acre at water well supply site	No unique geologic features; prime farmland impacts of 46 acres of the 100 acre facility site (46 acres of permanent impact and 54 acres remaining available for hay or pasture)	No impact
Water Quality	Potential sedimentation from site preparation, pipeline construction, transmission line construction, road improvements, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	Potential sedimentation from site preparation, pipeline construction, transmission line construction, substation construction, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	No impact
Floodplains	No floodplains on facility site; water well located in Deer Creek floodplain; pipeline construction crosses floodplains	No floodplains on facility site; pipeline construction crosses floodplains	No impact
Groundwater	Pumping of six million gallons per year or 18 acre-feet from Big Sioux aquifer for cooling water; crossing by natural gas pipeline of Zone B Well Head Protection Areas (29,262 linear feet)	Six million gallons per year of water would be obtained from municipal water supply, which is obtained from Big Sioux aquifer. Crossing by natural gas pipeline of Zone A Well Head Protection Area (805 linear feet) and Zone B (8,033 linear feet)	No impact

<b>Resource</b>	<b>White Site 1</b>	<b>White Site 2</b>	<b>No Action Alternative</b>
Wetlands and Streams	Based on National Wetland Inventory (NWI), impacts of 0.0 acres on facility site, 0.0 acres for transmission line corridor, and 0.0 acres for water pipeline corridor; temporary impacts of 1.75 acres in natural gas pipeline corridor; delineated wetlands of 3.2 acres on facility site, to be avoided to the extent practicable; delineated temporary impacts of 6.6 acres in natural gas pipeline corridor, 2.5 acres in water pipeline corridor, and 0.2 acres in transmission line corridor; some high quality potholes crossed	Based on NWI, wetland impacts of 0.02 acres on facility site and 0.21 acres for substation; temporary impacts of 1.70 acres for transmission line corridor, 0.05 acres in rural water pipeline corridor, and 0.61 acres in natural gas pipeline corridor; some high quality prairie potholes crossed	No impact
Vegetation	Existing site is cultivated cropland; a 100-foot wide corridor would be cut through an existing narrow forested shelterbelt along the eastern edge of the site for a waterline and access road; natural gas pipeline is 47 percent cultivated cropland and 34 percent pasture; distance through native prairie is 2,620 linear feet	Existing site is cultivated cropland; woodland on site would be avoided; natural gas pipeline is 55 percent pasture and 40 percent cultivated cropland, and 5 percent forested shelterbelt; no native prairie impacts	No impact
Wildlife	Minimal impacts; generation facility would be near inactive raptor nests and great horned owl nest; transmission line of 0.75 mile poses some collision risk to avian species	Minimal impacts; transmission line of 0.50 mile poses some collision risk to avian species	No impact
Special Status Species	Topeka shiner habitat in nearby Deer Creek and tributaries would not be impacted; also suitable habitat for Dakota skipper	Suitable habitat for Dakota skipper	No impact
Socioeconomics	360 temporary construction workers and 30 permanent employees; local government services adequate for worker influx; positive benefits from property taxes and right-of-way (ROW) easements		No impact
Environmental Justice	No impact	No impact	No impact

<b>Resource</b>	<b>White Site 1</b>	<b>White Site 2</b>	<b>No Action Alternative</b>
Land Use	115 acres converted to utility uses (75 still available for agriculture); new 13.2-mile pipeline ROW (all still available for agricultural uses)	109 acres converted to utility uses (63 still available for agriculture); new 10 mile pipeline ROW (all still available for agricultural uses)	No impact
Transportation	No adverse level of service impacts; roadways to be paved at intersections and near plant site; heavy haul temporary bridge over Deer Creek	No adverse level of service impacts; roadways to be paved near plant site	No impact
Visual	Project visible for up to four miles but would mix in with wind turbine views	Project visible for up to four miles; highly visible from SD 30; would mix in with wind turbine views; new substation would be additional new visual intrusion	No impact
Noise	Construction noise impacts; short term steam blow event; operational impacts within Department of Housing and Urban Development (HUD) guidelines	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	No impact
Public Health and Safety	Conformance to all Occupational Safety and Health Administration (OSHA) safety procedures for plant workers; minor general public impacts from increased traffic		No impact
Intentional Destruction	Minor security issues		No impact
Cultural Resources	No impacts to National Register of Historic Places (NRHP) eligible properties	Potentially NRHP-eligible sites on natural gas pipeline route	No impact
Recreation	Temporary impact to one Walk-in Area (WIA) (State hunting lease area) during pipeline construction	No impacts to public lands or hunting lease areas	No impact

## MAJOR CONCLUSIONS

Construction of a natural gas combined-cycle generation facility at either White Site 1 or White Site 2 would not result in any significant environmental impacts. Approximately 100 acres of agricultural land would be within the proposed Project fence; at White Site 1, 40 acres would be permanently converted to utility uses and 60 acres would be available for hay or pasture. At White Site 2 an additional 6 acres would be permanently converted. White Site 1 would result in groundwater pumping from the Big Sioux aquifer along Deer Creek, but water for White Site 2 would be obtained from a municipal water supply, which withdraws from a different location within the same aquifer. There is the potential for temporary

impact to native prairie and Dakota skipper habitat along the White Site 1 Natural Gas Pipeline route. These impacts would be minimized through a consultation process with State and Federal wildlife agencies. Positive social and economic impacts would be expected from Deer Creek Station construction. The relatively minor environmental impacts of Basin Electric's proposed Project on environmental resources would be offset by the societal benefits of a new source of electricity. It is not possible to quantify this benefit, as individuals would weigh the tradeoffs differently, and assign widely variable values to each resource.

## **AREAS OF CONTROVERSY**

No areas of controversy were identified during the scoping stages. This section will be updated following review of responses to the Draft EIS (DEIS).

## **ISSUES TO BE RESOLVED**

The analysis of impacts in this DEIS is based on conceptual design. The precise impacts to environmental resources such as wetlands and endangered species will be determined during the environmental permitting and consultation stage. However, as a result of this analysis, Basin Electric has committed to implement the following measures to avoid and minimize the potential for adverse effects:

- Best management practices (BMPs) for sediment and erosion control
- Stormwater Pollution Prevention Plan (SWPPP) including BMPs, Spill Prevention Control and Countermeasure Plan (SPCC), and good housekeeping measures for construction
- Dust control plan for roads and site construction
- Improvements to traffic control, including removal of a stop sign on northbound 484th Avenue at 207th Street intersection, and designated delivery route to avoid traffic on additional routes
- Monitoring wells would be installed to determine the cone of influence from water pumping along the Deer Creek floodplain and avoid permanent impacts to Deer Creek

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