

Deer Creek Station Project

Addendum to the South Dakota Public Utilities Commission Application Docket EL09-015

Final

January 2010

Prepared for:

Basin Electric Power Cooperative

Prepared by:

AECOM

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List of Acronyms and Abbreviations

ARSD	Administrative Rules South Dakota
BMP	Best Management Practice
CWA	Clean Water Act
ESCP	Erosion and Sediment Control Plan
gpm	Gallons per Minute
kV	Kilovolt
NO _x	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
ROW	Right-of-way
SD PUC	South Dakota Public Utility Commission
SDDENR	South Dakota Department of Environment and Natural Resources
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers

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1.0 Introduction

Basin Electric Power Cooperative submitted siting application Docket EL-09015 to the South Dakota Public Utilities Commission (SD PUC) in July 2009; this document is an addendum to the siting application. This addendum provides additional information and updated materials related to project changes that have occurred since the submission of the application.

1.1 Executive Summary

The executive summary provided in the original application had incorrect document heading numbers associated with the section names. Table 1.1-1 provides a corrected summary table that corresponds with the original application Docket EL-09015 Table ES-1.

Table 1.1-1:
Regulatory Requirements/Application Section Cross-Reference Tables

Document Heading Number	Section Name	PUC Siting Rule Section
	Introduction	
2.1	Names of Participants	ARSD 20:10:22:06
2.2	Name of Owner and Manager	ARSD 20:10:22:07
	Energy Conversion Facility, Water Pipeline and Transmission Siting Permit	
3.1	Purpose of the Project	ARSD 20:10:22:08
3.2	Estimated Project Costs	ARSD 20:10:22:09
3.3	Demand for the Project	ARSD 20:10:22:10
3.4	Site Description	ARSD 20:10:22:11
3.5	Alternative Sites and Routes	ARSD 20:10:22:12
3.6	Environmental Information and Effect on Physical Environment	ARSD 20:10:22:13
3.6.5	Water Quality	ARSD 20:10:22:20
3.6.6	Terrestrial Ecosystems	ARSD 20:10:22:16
3.6.7	Aquatic Ecosystems	ARSD 20:10:22:17
3.6.8	Land Use and Local Land Controls	ARSD 20:10:22:18 ARSD 20:10:22:19
3.6.9	Air Quality	ARSD 20:10:22:21
3.7	Time Schedule	ARSD 20:10:22:22
3.8	Community Impacts	ARSD 20:10:22:23
3.8.2	Employment/Labor Market	ARSD 20:10:22:24
3.9	Liquid Transmission Line Standards of Construction for the Water Pipeline	ARSD 20:10:22:37
	Nature of Proposed Project	
4.0	Nature of Proposed Project	ARSD 20:10:22:26
4.1.4	Products to be Produced	ARSD 20:10:22:27
4.2	Transmission Line Description	ARSD 20:10:22:35
4.3	Water Pipeline Description	ARSD 20:10:22:38
4.5	Solid Waste	ARSD 20:10:22:31
4.6	Estimate of Expected Efficiency	ARSD 20:10:22:32
4.7	Future Additions and Modifications	ARSD 20:10:22:25
4.8	Decommissioning	ARSD 20:10:22:33

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Document Heading Number	Section Name	PUC Siting Rule Section
	Additional Information in Application	
5.0	Additional Information in Application	ARSD 20:10:22:36
	Testimony and Exhibits	
6.0	Testimony and Exhibits	ARSD 20:10:22:39
	Application for Party Status	
7.0	Application for Party Status	No information requested by rule

1.2 Other Required Permits and Approvals

Table 1.2-1 is an updated list of the federal, state, and local permits required for construction and operation of the project.

Table 1.2-1
Required Permits, Approvals, and Consultations

Federal/State/Local	Agency	Permits/Approvals/Consultations	Timing
Federal	Western Area Power Administration	Approval through a Record of Decision on an Environmental Impact Statement	Prior to Construction
	U.S. Fish and Wildlife Service	Threatened and Endangered Species, Section 7(Biological Assessment)	Prior to Construction
	U.S. Environmental Protection Agency	Spill Prevention, Control and Countermeasure Plan	Prior to Operation
	U.S. Army Corps of Engineers	Section 404 Compliance for Impacts to Jurisdictional "Waters of the United States"	Prior to Construction
State	Public Utilities Commission	Energy Conversion Facility Siting, Transmission Siting, and Water Pipeline Siting Permit	Prior to Construction
	South Dakota Department of Environment and Natural Resources	Water Appropriation for Non-Irrigation Uses	Prior to Construction
	South Dakota Game, Fish and Parks	State-listed Endangered Fish and Wildlife	Prior to Construction
	South Dakota State Historical Society, State Historical Preservation Officer	Cultural and Historic Resources Review	Prior to Construction
	South Dakota Department of Environment and Natural Resources	Title V Operating Air Permit	Prior to Operation
	South Dakota Department of Environment and Natural Resources	Sewage Disposal Permit	Prior to Construction
	South Dakota Department of Environment and Natural Resources	National Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activities	Prior to Operation

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Federal/State/ Local	Agency	Permits/Approvals/Consultations	Timing
	South Dakota Department of Environment and Natural Resources	National Pollution Discharge Elimination System General Permit for Stormwater Discharges from Industrial Activities	Prior to Operation
	South Dakota Department of Environment and Natural Resources	Registration of Aboveground Tanks	Prior to Operation
	South Dakota Department of Environment and Natural Resources	No Exposure Certification (for exclusion from Stormwater Discharges associated with Industrial Activities)	Prior to Construction
	South Dakota Department of Environment and Natural Resources	Temporary Water Use Permit for Construction Activities, Drilling or Testing Purposes	Prior to Construction
Local	Brookings County	Conditional Use Permit	Prior to Construction
	Brookings County	County Permissions to Occupy Right-of-Way Permits, County Road Crossing Permits	Prior to Construction
	Sherman, Richland, and Lake Hendricks, Alton Townships	Road Use Agreements	Prior to Construction

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2.0 Energy Conversion Facility, Water Pipeline, and Transmission Siting Permit

2.1 Site Description

An updated vicinity map and overview of the Deer Creek Station Project components are provided in Appendix A, Exhibit A 2.1-1. Final transmission line alignment, water pipeline alignment, and well location are shown in Appendix A, Exhibit A 2.1-2 with an aerial photo view and in Appendix A, Exhibit A 2.1-3 with a topographic view.

2.1.1 Description of the Well Site and the Water Pipeline

Groundwater will be used for process water; two wells and a water pipeline will be developed for this use. Each groundwater supply well will be designed to provide the required volumes for the facility. The second groundwater supply well is for redundancy purposes. Appendix A, Exhibits A 2.1-2 and A 2.1-3 show the location of the water pipeline and the first groundwater supply well; the second groundwater supply well location will be determined following installation and a hydrogeologic performance evaluation of the first groundwater supply well. Design drawings of the water pipeline including centerline and the location of the initial well are provided in Appendix B.

The 6-inch-diameter water pipeline will be 1.2 miles long from the water supply well to the site tie-in point. The two ground water supply wells discharges will be tied-together at the well site by a valve arrangement to the 6-inch-diameter water pipeline to the plant site. The water pipeline will leave the well site and parallel the eastern border of the siting area, and then exit the siting area to cross 207th Street via horizontal directional drilling. On the northern side of 207th Street, the water pipeline will head north, paralleling the road within property currently owned by Basin Electric. The water pipeline will be located below ground in existing grassland and herbaceous land as well as wetland areas. The water pipeline will continue to parallel 484th Avenue for approximately 0.75 mile. The water pipeline turns to the tie-in point in the energy conversion facility near the site main entrance.

2.1.2 Description of the Transmission Corridor

The proposed transmission alignment is situated within the NE, SW, and SE Quarters of T111N R48W, Section 25 as shown in Appendix A, Exhibits A 2.1-2 and A 2.1-3. The alignment is 0.59 mile long and ends at the existing White Substation. The transmission alignment will have a 150 to 175 foot permanent right-of-way (ROW); additional temporary construction ROW is not anticipated.

Land in the ROW is primarily used for crop cultivation, although herbaceous grassland communities and wetlands are present. Once construction and revegetation have been completed, the transmission corridor can continue to be used for crop cultivation.

A portion of the proposed transmission corridor is owned by Basin Electric and easements will be acquired for the remainder. The terrain is relatively flat, well-drained agricultural land on a topographic incline.

2.1.3 Evaluation of Sites Considering Reliance upon Eminent Domain

Basin Electric currently owns the NE Quarter section of T111N R48W Section 25, the location of the Deer Creek Station site. Easements have been acquired for the transmission ROW. There are three landowners in the vicinity of the water well site and water pipeline. Leases have been acquired for the additional workspace area for water pipeline and Basin Electric will attempt to acquire easements on the remaining parcels. Basin Electric representatives gathered information from landowners during informational meetings held regarding the project and through individual landowner discussions. Easements for the water supply site and the water pipeline are being negotiated with landowners and a mutually agreed upon dollar amount will be paid to landowners for use of this land. Formal option easement negotiations are expected to be complete in the first quarter of 2010.

2.1.4 Water Use and Quality

It is anticipated that the single-unit energy conversion facility will normally consume 15 gallons of treated water per minute; the maximum consumption will be 49 gallons of treated water per minute. The estimated annual average use is anticipated to be 6 million gallons, or 18 acre-feet.

Process water generated by the energy conversion facility will be reused when possible by routing any waters to the on-site aboveground storage tanks for reuse. The average flow rate to the tank will be 15 gallons per minute (gpm), or 21,600 gallons per day. A trailer-mounted portable water treatment de-mineralizer unit will be utilized to treat the process water. The treatment trailers will be capable of treating approximately 600,000 gallons of water before returning to their supplier. The treatment system is currently designed to treat the groundwater that is stored in the approximately 600,000 gallon Raw Water Storage Tank at a 200 gpm thru put rate. The treated water is then stored in a 600,000 gallon Treated Water Storage Tank. Each individual treatment trailer is expected to be on-site approximately three days and then returned to the vendor for re-processing. The treated water tank capacity will allow for approximately 20 days at design plant operation. There will be no water treatment reject water.

In the future, Basin Electric may build a permanent water treatment system on-site. Under that scenario, water treatment reject water may be discharged to surface water; Basin Electric would submit an individual permit to obtain a National Pollution Discharge Elimination System Permit to Discharge Industrial Nonprocess Water from New Industrial Facility Permit (NPDES) from the South Dakota Department of Environment and Natural Resources (SDDENR) prior to placing in service. Water treatment reject water would be discharged off site after meeting all necessary permit conditions of the SDDENR-issued NPDES permit. Discharge rates and volumes would be determined; all industrial discharges would meet quality and quantity limits set by SDDENR to protect the water quality.

Before the start of construction, a National Pollutant Discharge Elimination System (NPDES) permit application will be submitted to the South Dakota Department of Environment and Natural Resources (SDDENR) for a General Permit for Stormwater Discharges from Construction Activities. Prior to application submittal, a SWPPP will be developed and implemented; this SWPPP will include site-specific BMPs to minimize the potential for stormwater contamination. BMPs will be maintained until final stabilization of the disturbed construction areas has been achieved.

Construction of the energy conversion facility site, transmission, and water pipeline will comply with all applicable federal, state, and local permits required for alteration of wetlands, streams, or rivers as a result of the project. The U.S. Army Corps of Engineers (USACE) will require the project to obtain a Clean Water Act (CWA) Section 404 Nationwide 12 Permit prior to construction. The project will comply with all requirements of the permits and terms of approval from the USACE.

Long-term effects from the water supply wells on groundwater quality are being analyzed in the Environmental Impact Statement (EIS). Appropriate mitigation measures to minimize potential impacts associated with groundwater withdrawal will be discussed in the EIS.

Construction of the facility, transmission line, and water pipeline will comply with all applicable federal, state, and local permits and requirements for protection of water quality. Basin Electric will also apply for the required state permit for the stormwater retention pond. The application will require submittal of engineering drawings and specifications along with operating parameters. Construction of the stormwater retention pond will not be initiated until agency approval is received.

Once the construction and permanent stabilization of the energy conversion facility site has been completed, the project will terminate the General Permit for Stormwater Discharges from Construction Activities and apply for a NPDES General Permit for Stormwater Discharges from Industrial Activities as required by SDDENR. A SWPPP for the operational phase will be developed and implemented prior to the start of plant operation. The SWPPP will include site-specific BMPS to minimize exposure of stormwater to industrial activities. All stormwater that potentially comes into contact with plant operations will flow to the stormwater retention pond.

Possible impacts to surface waters, wetlands, and riparian communities from contamination will be mitigated through energy conversion facility design, mitigation measures, and in accordance with the South Dakota NPDES General Permit for Stormwater Discharges from Industrial Activities, the CWA, and Section 404.

2.2 Community Impacts

Basin Electric has garnered support for the project from local communities. Resolutions of community support from the Brookings County Commission, the Brookings City Council, Deuel County Commission, the Elkton City Council, and the Hendricks, Minnesota Economic Development Authority were provided in the PUC application. Resolutions of community support from the City of Aurora, the Town of White, and the City of Hendricks, Minnesota are provided in Appendix C.

Brookings County has approved a Conditional Use Permit Application for the project, as indicated in Appendix D.

2.2.1 Visual Impacts

The transmission structure type for the proposed project has changed and is described in detail in Section 3.3. The 345-kilovolt (kV) single-circuit transmission line structures would be constructed in an H-frame steel pole configuration and would be approximately 85 feet tall. Transmission

structure visibility impacts would be the same as described previously in the siting application. A visual simulation that shows the updated transmission lines as well as the proposed energy conversion facility is provided as Appendix A, Exhibit A 2.3-1

2.2.2 Cultural Resources and Landmarks

In November 2008, a Class I records search was completed for the Deer Creek Station site and well siting area, and a Class III pedestrian survey was conducted by staff from Ethnoscience, Inc. and tribal representatives for the well siting area and the Deer Creek Station site. In October 2009, a Class I records search was completed, and a Class III pedestrian survey was conducted by staff from Ethnoscience, Inc. and tribal representatives for the electric transmission corridor and the water pipeline corridor. No eligible cultural features were identified via the Class I survey for the transmission corridor, well siting area and water pipeline, or the Deer Creek Station site in either 2008 or 2009. Furthermore, no cultural features or materials were observed during the pedestrian inventories in these areas in either 2008 or 2009.

In the event that prehistoric or historic cultural resources are discovered during construction or operation of the proposed project, the Unanticipated Discovery Plan (provided in Appendix E) will be implemented. Class I and Class III reports have been submitted to the State Historic Preservation Officer and to Western Area Power Administration to support the project EIS.

2.3 Standards of Construction for the Transmission Line

H-frame transmission structures typically require two augured or excavated holes, each 3-6 feet in diameter and 10-15 feet deep depending on soil conditions. These holes will accommodate direct-embedment of pole structures or concrete foundations. The contractor will directly embed tangent structures and build concrete foundations for angle and dead-end structures.

Construction mats are placed in wet or soft soil locations and narrow ditches to minimize disturbances. Once the structures are set, any holes are backfilled with the excavated material, native soil, or crushed rock. If landowner permission is obtained, it is preferred to spread excess soil from foundation holes on the structure site. If spreading the excess soil is not permitted, it will be offered to the landowner or will be completely removed from the site.

3.0 Nature of Proposed Project

3.1 Materials Flowing into the Energy Conversion Facility

The materials flowing into the energy conversion facility will be natural gas, water, and air. The facility will consume a maximum of 100 gpm of ground water for process water and makeup water and an estimated 1 gpm of groundwater for potable use. Process water usage for the energy conversion facility will be minimal because an air-cooled condenser, rather than a water-cooled condenser and cooling tower combination, will be used to condense steam that will exit the steam turbine. The energy conversion facility will use water for evaporative cooling, and for makeup water needs. It is anticipated that the single-unit energy conversion facility will consume 41 gallons of treated water per minute; the maximum consumption will be 86 gallons of treated water per minute. The estimated annual average use is anticipated to be 6 million gallons.

Table 3.1-1 provides a list of potentially hazardous chemicals to be used at Deer Creek Station that will be brought into the facility for operational use.

**Table 3.1-1:
Potentially Hazardous Chemicals to Be Used at Deer Creek Station**

Equipment	Purpose	Product	Storage Vessel	Storage Volume	Use Rate	Estimated Annual Use Rate
SCR	NOx Control (Main Stack)	Anhydrous Ammonia	Metal Tank	2000 gallon, 1700 of useable space	40 pound/hour	15,000 gallon
Emergency Diesel Generator	Emergency Electrical Generation	Low Sulfur Diesel	Metal Tank	3000 gallon, 2500 useable gallon	105 gallon/hour	52,500 gallon
Emergency Diesel Fire Pump	Emergency Fire Protection	Low Sulfur Diesel	Metal Tank	700 gallon	29 gallon/hour	14,500 gallon
Condensate and Boiler Feedwater Treatment	pH Adjustment	Aqueous Ammonia	Totes	300 gallon	1.25 gallon/hour	3700 gallon
Condensate and Boiler Feedwater Treatment	Oxygen Scavenging	Carbohydrazide	Drums	55 gallon	0.15 gallon/hour	450 gallon
Condensate and Boiler Feedwater Treatment	Boiler pH Control and Buffering	Phosphate	Pails	25 pound	0.05 pound/hour	150 gallon
Makeup Water Treatment		Sulfuric Acid	Totes			
Makeup Water Treatment		Caustic	Totes			
Makeup Water Treatment		Sodium Hypochlorite	Totes			
Makeup Water Treatment	Anti-Scalant	GE Betz Hypersperse or equal	Totes			
Makeup Water Treatment	Softener	Sodium Bisulfite Sodium Chloride				

Equipment	Purpose	Product	Storage Vessel	Storage Volume	Use Rate	Estimated Annual Use Rate
Makeup Water Treatment	RO Cleaning Agent	Citric Acid				
HRSB	HRSB blanketing	Nitrogen	330 cubic foot cylinder(s) or 40,000 cubic foot tube trailer	11,880 cubic feet (three 12-packs of cylinders) to 40,000 cubic feet	Normal is zero.	10,000 cubic feet (one complete HRSB fill)
Gas Turbine	Gas Turbine Generator Purge	CO ₂	330 cubic foot cylinder(s)	11,880 cubic feet (three 12-packs of cylinders)	Normal is zero	8,000 cubic feet (one complete generator purge)
Gas Turbine	Gas Turbine Fire Protection	CO ₂	Metal tank	104,000 cubic feet	Normal is zero	Normal is zero
Gas Turbine	Gas Turbine Generator Cooling	Hydrogen	330 cubic foot cylinder(s) or 40,000 cubic foot tube trailer	11,880 cubic feet (three 12-packs of cylinders) to 40,000 cubic feet	300 cubic feet/day	118000 cubic feet (one complete generator fill plus daily use)

3.2 Materials Flowing out of the Energy Conversion Facility

Process water will require water treatment to remove the mineral and dissolved solids. The water treatment will consist of filtration, cation-anion exchange, and de-gasification. Reject water will be generated during backwash cycles and through periodic cleaning operations of the filters. The reject water will be routed to wastewater sumps and routed back to the Raw Water Storage Tank for re-use. Any solid materials and or hydrocarbon-based fluids that are found to be within the sumps will be removed and will then be hauled off site and disposed of at an appropriate facility permitted to receive that type of waste. In the future, Basin Electric may build a water treatment system on site. In the event that reject water is to be discharged to surface water, Basin Electric would submit an individual permit application to obtain a National Pollution Discharge Elimination System Permit to Discharge Industrial Nonprocess Water from a New Industrial Facility (NPDES) from the South Dakota Department of Environment and Natural Resources (SDDENR) prior to operation. Water treatment reject water would be discharged off site after meeting all necessary permit conditions of the SDDENR-issued NPDES permit. Discharge rates and volumes would be determined; all industrial discharges would meet quality and quantity limits set by SDDENR to protect the water quality.

3.3 Transmission Line Description

The transmission line will be a 345-kV single-circuit transmission line, 0.59 mile in length. The temporary construction easement and permanent easement will be 150 to 175 feet wide. The 345-kV single-circuit transmission line structures would be constructed in an H-frame steel pole configuration and would be approximately 85 feet tall as shown in Appendix A, Exhibit A 3.2-1. The structure pole spacing will be 27.5 feet with a phased spacing of 27.5 feet. The structures will

have either direct-embed foundations or concrete foundations that will range from 3-6 feet in diameter. The typical span between structures would be approximately 400-500 feet.

Appendix F provides plan and profile drawings of the transmission line and structures that show configuration of the towers and poles and conductor configuration and size, and length of span between structures.

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4.0 Testimony and Exhibits

AECOM staff, Mark Rothfork, contributed to the development of this addendum and has been added to the list of preparers as follows:

Name	Responsibility/Specialty	Education/Degree
AECOM		
Mark Rothfork	Assistant Project Manager	<ul style="list-style-type: none"> • Bachelor of Science (Ecology), Minnesota State University, Mankato

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4.1 Applicants' Verification

Verified Applicant's Signature

State of: North Dakota

City of: Bismarck

Gavin McCollam, being duly sworn, deposes and says that he is the Project Manager of the Deer Creek Station project and is the authorized agent of Basin Electric Power Cooperative, and is also authorized to sign this addendum on behalf of the project owner, Ronald R. Harper, CEO and General Manager of Basin Electric Power Cooperative.

He states that he does not have personal knowledge of all of the facts recited in the foregoing addendum, but the information in the addendum has been gathered by and from employees and contractors of the owner of the Deer Creek Station Project and that the information in the application is verified by him as being true and correct on behalf of Ronald R. Harper, CEO and General Manager of Basin Electric Power Cooperative.

1/18/10

(Date)



(Signature)

NOTARY PUBLIC INFORMATION

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