

**November 2014 Update: Evaluation of Otter Tail's Air Quality Control System Project as the Least Cost Option Compared to Other Alternatives**

*Prepared by:*

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*On Behalf of*

**South Dakota Commission Staff  
Docket No: EL14-082**

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## **A. PROCEDURAL BACKGROUND**

On March 30, 2012, Otter Tail Power Company, (“OTP” or “Company”), filed a petition with the South Dakota Public Utilities Commission (“Commission”) for approval of an Environmental Quality Cost Recovery Tariff (“ECR Rider”), pursuant to SDCL Chapter 49-34A, Sections 97 through 100, relating to approval of tariff mechanisms for automatic annual adjustment of charges for jurisdictional costs of new environmental measures. The purpose of the filing at that time was to begin cost recovery associated with the Air Quality Control System (“AQCS”) environmental retrofit for the Big Stone generating station located in South Dakota. The AQCS equipment was required based on a Best Available Retrofit Technology (“BART”) determination by the South Dakota Department of Environment and Natural Resources (“DENR”) in its Regional Haze State Implementation Plan (“SIP”). On behalf of Commission Staff, KM Energy Consulting, LLC (“KM\_EC”) was tasked with evaluating whether OTP’s decision to install AQCS equipment at Big Stone was the least cost option for reliably fulfilling the utility’s long term energy and capacity requirements compared to other alternatives.

KM\_EC’s final report was submitted to the Commission on January 25, 2013, and concluded that the AQCS project was the least cost alternative to meet energy and capacity needs compared to other alternatives. Subsequent to the submittal of this report, the Company withdraw its petition due to lack of agreement between OTP and Commission Staff on issues relating to the rate of return to be used on the construction work in progress (CWIP) expenditures. (*See* docket EL12-027, OTP letter dated April 17, 2013)

On August 29, 2014, the Company filed a new petition to seek recovery of costs related to the AQCS project via approval of the ECR Rider and requested approval of November 1, 2014, implementation (“New Petition”)<sup>1</sup>. Aside from proposing to seek recovery of OTP’s share of the AQCS related costs, OTP is also seeking recovery of the Hoot Lake environmental retrofit to comply with EPA MATS.

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<sup>1</sup> See Docket EL14-082

On behalf of Commission Staff, KM\_EC was tasked with reviewing the previous report submitted on January 25, 2013, to (a) ascertain whether any changes in the recommendations included in the report were needed and (b) update the analysis if necessary. The following discussion accomplishes these tasks. The evaluation of the Hoot Lake environmental retrofit as a least cost alternative is reported in a separate document.

## **B. EVALUATION OF THE AQCS**

Since the decision to install AQCS was included in the Company's 2010 Integrated Resource Plan ("IRP"), the evaluation should remain anchored to that time period. In other words, it would not be appropriate to assess the cost effectiveness of the AQCS assuming for example, current forecasts of demand and supply conditions, evaluating against other updated supply side alternatives or environmental regulation changes. Rather, the evaluation must be based on assessing the reasonableness of the AQCS project at the time the decision was made. Consequently, the passage of time does not change the recommendation identified in the previous report. That is, OTP's AQCS project is the least cost alternative compared to other alternatives in fulfilling the Company's long term energy and capacity needs. The report is included in Exhibit – 1.

## **C. UPDATE RELATED TO AQCS**

Notwithstanding the status of the recommendation that OTP's AQCS is the least cost alternative, below is an update of the current status of the project as well as an assessment of how the currently proposed EPA 111(d) rule impacts Big Stone.

1. **Current AQCS Project Status:** As per the New Petition, OTP reduced the total project budget from \$491 million to \$384 million, a reduction of \$107 million or approximately 22%. Cost recovery for this project has been approved and is underway in Minnesota and North Dakota. Project costs of over \$210 million (\$113.3 million OTP share) have been incurred as of June 30, 2014. The projection for total project expenditures is an additional \$174 million (\$94 million OTP share) for a total of \$384 million (\$207 million OTP share).
2. **EPA's Proposed 111 (d) Impacts:** In Commission Staff's data request 2-2, the Company was asked about the implications for Big Stone if EPA's proposed 111(d) rule is

implemented as proposed, whether the retrofits would still be cost effective, and whether OTP conducted any sensitivity analysis regarding potential greenhouse gas (GHG) emission reductions.

As referenced in OTP's response, the Commission hosted a forum on July 31, 2014, to gain a better understanding of the impacts, implications and other issues of the EPA's proposed plan to reduce carbon emissions from existing power plants. This event was well attended and included representatives from investor owned utilities, municipal utilities, cooperatives, regional transmission organizations, South Dakota DENR, and EPA.

a. Feasibility of Building Blocks 1 and 2: Consistent with the feedback provided in the July forum, OTP indicated in response to Commission Staff's data request 2-2 (a) that with respect to Big Stone, Building Block 1 is unachievable and Building Block 2 is flawed as it related to South Dakota. OTP stated the following:

Specific to Big Stone Plant, as described by Otter Tail personnel at the July 31st South Dakota PUC 111(d) Forum in Sioux Falls, the 111(d) rule as proposed for South Dakota is infeasible. Building block 1 is unachievable at Big Stone Plant since the plant has already performed – or is in the process of performing – the heat rate improvement projects identified by EPA. Furthermore, the owners of the Big Stone Plant are investing \$384 million to install pollution control equipment in 2015 to comply with EPA's Regional Haze Rule. This equipment will take a significant amount of power to operate, and therefore net plant heat rate may degrade because it may take the same amount of fuel to produce a lesser amount of net plant output. Building block 2 is more concerning, because rigidly applying that building block to Big Stone Plant would result in severely restricting operation to approximately half the year.

Otter Tail has been discussing the flawed methodology of applying building block 2 in South Dakota with numerous stakeholders, including EPA. Building block 2 is flawed because it envisions redispatching a significant amount of energy between Big Stone Plant and Deer Creek Station – which is owned by Basin Electric Power Cooperative. This re-dispatch is not possible within the current industry and regulatory constructs because Big Stone and Deer Creek are separately owned, serve unique loads, there are no firm transmission rights from Deer Creek to the loads served by Big Stone, and they are committed and dispatched by two separate entities with unique commitment and dispatch processes. Notwithstanding the infeasibility of building block 2 in South Dakota, this block was further skewed due to Deer Creek Station being under

construction for most of 2012 (EPA's baseline year for determining plant capacity factor), resulting in an unrepresentative 1% capacity factor. Block 2 wrongly assumes that Deer Creek's capacity can be increased by 69%, and backing down Big Stone Plant the corresponding amount. Otter Tail is strongly advocating that combined cycle plants that were not operational on January 1, 2012 - such as Deer Creek - are assigned an "under construction" designation in EPA's Clean Power Plan formula. This designation would apply an assumed 55% capacity factor to Deer Creek Station that is more representative of the expected operation of new natural gas combined cycle power plants.

b. Cost Effectiveness of the AQCS project in light of 111(d): In response to Commission Staff's data request 2-2(b), OTP indicated that the AQCS project is cost effective in light of EPA's proposed 111(d) rule. The analysis was conducted assuming no changes in Big Stone's capacity factors as would be the case under Building Block 2 as currently proposed. The Company compared the present value of revenue requirements (PVRR) of two scenarios related to Big Stone: Scenario 1 assumed that Big Stone is replaced with a natural gas combined cycle plant in 2025, the mid-point of the interim goal period in EPA's proposed 111(d) rule and Scenario 2 assumed that the replacement would occur by June 2017 since Big Stone would need to discontinue operations in order to prevent non-compliance with EPA's Regional Haze Rule. According to OTP's response, the PVRR of Scenario 2 was over \$150 million more than Scenario 1 meaning that it is more cost effective to install the AQCS retrofit and not prematurely retire and replace the baseload plant.

c. Analysis of GHG emission reductions when considering the AQCS project: At the time when the AQCS project was being evaluated, the Company also assessed the impacts of varying levels of a carbon tax. Although an evaluation of GHG emission reductions was not directly evaluated (since EPA's proposed 111(d) rule was introduced in 2014), the sensitivity analysis regarding varying assumptions of carbon tax was a reasonable proxy to ascertain such impacts. Analyses conducted in Minnesota and North Dakota proceedings generally indicated that the AQCS

was least cost under varying carbon tax assumptions as also indicated in KM\_EC's January 23, 2013 report.

There is significant uncertainty surrounding EPA's proposed 111(d) rule and the conventional expectation is that it will be extensively litigated. Based on the foregoing feedback from the Company, certain provisions especially related to Building Blocks 1 and 2 are infeasible and it is expected that OTP will be contesting these provisions. Comments on the proposed rule are due on December 1, 2014.

#### **D. CONCLUSION**

OTP's AQCS project is the least cost alternative compared to other alternatives in fulfilling the Company's long term energy and capacity needs. The Company was able to reduce project costs in the best interest of customers. Even in light of EPA's proposed 111(d) rule, the AQCS project remains cost effective.