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ATTACHMENT 6

**BIG STONE AQCS PROJECT OPERATING AND
MAINTENANCE COST CALCULATIONS**

Docket No.
PU-11-163/ PU-11-165
OTP/MDU-107

**ATTACHMENT 6
BIG STONE AQCS PROJECT
OPERATING & MAINTENANCE (O&M) COST CALCULATIONS¹**

Current Big Stone Plant O&M Costs

2010 Big Stone O&M Non-fuel Budget	\$13,655,000
2010 Costs Escalated to 2016 at 3%	\$16,304,784
2016 O&M Costs (Rounded)	\$16,300,000

Additional Big Stone Plant O&M Costs with Addition of AQCS Project

The following is a summary of cost developed jointly by Sargent & Lundy, LLC and Otter Tail Power Company (OTP) based on conceptual design assumptions.²

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Parameter	SCR	DFGD with New Baghouse
Fixed O&M, \$M/yr		
Variable O&M, \$M/yr		
Total O&M, \$M/yr		
Total AQCS O&M, \$M/yr		

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The variable O&M costs are comprised almost entirely of reagent (lime and ammonia) costs. In the conceptual design phase, reagent usage was calculated at permitted conditions and with no reduction in NO_x from operation of the SOFA system.

AQCS Project Adjusted Variable Costs

To obtain a variable cost estimate that will reflect operating conditions after installation of the AQCS Project, OTP has reduced variable costs to match actual operating conditions based on less flow and less NO_x to remove.

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Parameter	SCR	DFGD with New Baghouse
Fixed O&M, \$M/yr		
Variable O&M, \$M/yr		
Total O&M, \$M/yr		
Total AQCS O&M, \$M/yr		11.0

¹ Prepared by Mark Rolfes, P.E., Manager, Generation Development, Otter Tail Power Company (Jan. 4, 2011).

² See Attachment 5 at 6-2.

For the SCR and semi-dry FGD system the largest portion of the O&M cost are attributable to the reagents used for the chemical reactions. Ammonia in the SCR and Lime in the semi-dry FGD. Based on the current conceptual design, the reagents account for approximately 2/3 of the total variable O&M cost. The remainder is for auxiliary power and maintenance materials.

Total Big Stone O&M Costs with AQCS

Big Stone O&M	\$16,300,000
AQCS O&M	\$11,000,000
Total O&M	\$27,300,000

O&M Costs for Activated Carbon Injection System (ACI)

The following is a summary of cost developed jointly by Sargent & Lundy and OTP based on conceptual design assumptions.

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Parameter	ACI
Fixed O&M, \$M/yr	
Variable O&M, \$M/yr	
Total O&M, \$M/yr	

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ACI System Adjusted O&M Costs

To obtain a variable cost estimate that will reflect operating conditions after installation of the ACI Project, OTP has reduced and rounded the O&M cost to match actual operating conditions based on less flow.

In particular, OTP has revised the O&M cost estimate for the ACI system to \$2.0 million per year.