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June 25, 2009

CTS: 214031

Mr. Trevor Baggio  
Manager, Air Quality Permits Section  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, Arizona 85007

**Re: Response to Request for Additional Information  
Best Available Retrofit Technology (BART) Analysis  
Salt River Project - Coronado Generating Station  
Permit No. 30732**

Dear Mr. Baggio:

Salt River Project (SRP) owns and operates the Coronado Generating Station (CGS) in St. Johns, Apache County, Arizona. CGS operates pursuant to Class I Permit No. 30732 issued by the Arizona Department of Environmental Quality (ADEQ).

SRP submitted a Best Available Retrofit Technology (BART) analysis to the ADEQ on February 11, 2008. In a letter to SRP dated May 5, 2009, the ADEQ requested additional information on the BART analysis for CGS. Responses to the questions included in the ADEQ letter are provided below.

- 1. The submittal presents the economic analysis that was performed to support the final recommendations for BART technologies and associated emission limits. There are numerous assumptions that are made to perform the cost computations. It appears that some of these are engineering and business assumptions and some other information may have been obtained as quotes from vendors. ADEQ hereby requests that SRP provide all supporting information relating to the economic analysis. This supporting information should include an explanation of all assumptions made in the economic analysis, including the choice of the interest rate used in the analysis.***

A detailed cost breakdown for each control option considered in the BART analysis submitted by SRP is provided in Attachments #1 and 2. The cost estimates included in the tables in Attachment #1 were obtained from Sargent and Lundy (S&L), the engineering firm retained by SRP for the emission control projects currently in progress at CGS. A letter from S&L containing the cost estimates for each control technology is provided in Attachment #2.

It is important to note that the costs included in the tables and in the letter from S&L are based on estimates obtained in 2007, prior to the submittal of the BART analysis in February 2008. These costs are expected to be much higher today given the significant escalation in costs since the estimates were developed.

Since the submittal of the BART analysis in February 2008, SRP has completed the installation of Low-NOx Burners and Overfire Air (LNB/OFA) on Unit 1 at CGS. The actual capital cost of the project is included for reference in Table 6 of Attachment #1. Although the actual cost of LNB/OFA is higher than the cost that was estimated in the BART analysis submitted in February 2008, this does not affect the conclusions of the February 2008 BART submittal.

2. *The BART analysis does not recommend any control technology as BART for oxides of nitrogen (NOx). SRP makes the conclusion that NOx controls are not necessary for BART based on the premise that significant visibility improvements will result from the installation of wet flue gas desulfurization units. On a cost basis, ADEQ has determined that some of the NOx control options that were considered are cost effective. Please provide more documentation to substantiate the claim that further NOx controls are not necessary to address BART.*

The control technology proposed as BART in the February 2008 submittal was selected based on consideration of the five factors set forth in the United States Environmental Protection Agency (EPA) BART Guidelines. The Guidelines indicate that the level of control should be selected based on the costs of compliance, the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source, and the degree of visibility improvement which may reasonably be anticipated from the use of BART.<sup>1</sup> Based on the negligible improvement in visibility associated with all of the NOx control options considered in the February 2008 BART analysis, SRP did not recommend any NOx control as BART. Only Wet Flue Gas Desulfurization (FGD) was proposed as BART for CGS.

It should be noted that since the submittal of the February 2008 BART analysis, SRP has entered into a Consent Decree (CD) with the EPA.<sup>2</sup> As part of the CD, SRP has committed to installing LNB/OFA on Units 1 and 2, and Selective Catalytic Reduction (SCR) on Unit 2, by the year 2014. This is equivalent to "Control Option 4b" identified in the February 2008 BART report submitted by SRP to the ADEQ. Based on a consideration of the five statutory factors, SRP believes that this control strategy is better than BART. SRP's commitment to the installation of additional controls beyond BART is expected to provide emission reductions that will contribute to the longer term attainment of the Regional Haze program goals.

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<sup>1</sup> See 40 C.F.R. §51.308(e)(1)(ii)(A); 70 Fed. Reg. 39,158 (2005).

<sup>2</sup> Consent Decree, U.S. EPA v. Salt River Project, Civ. Action No. 2:08-cv-1479-JAT (D. Ariz., Dec. 22, 2008).

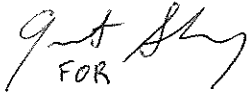
June 25, 2009

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If you have any questions regarding this letter, please feel free to contact Grant Smedley at (602) 236-2928, or me at (602) 236-2968.

Sincerely,

A handwritten signature in black ink, appearing to read "Grant Smedley".

FOR  
Kevin Wanttaja  
Manager, Environmental Services

cc: Mr. Gerardo Rios, EPA Region 9

LOC 5-1-1

**Attachment 1: Control Costs**

**ATTACHMENT 1. BART CONTROL COST CALCULATIONS**  
**Salt River Project - Coronado Generating Station**

*Table 1. Costs for Control Option #2 - Wet FGD on Both Units*

Item	Cost	Basis/Reference
Annual O&M Cost	\$11,600,000	S&L Letter, Attachment #2
Capital Cost (Total)	\$347,000,000	S&L Letter, Attachment #2
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$ where $i$ = interest rate and $n$ = amortization period
Annual Capital Cost	\$32,753,330	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$44,353,330</b>	Annual Capital Cost + Annual O&M Cost

*Table 2. Costs for Control Option #3 - LNB on Both Units*

Item	Cost	Reference/Source
Annual O&M Cost	\$0	
Capital Cost (Total)	\$13,000,000	Estimated Equal to SNCR Capital Cost
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$ where $i$ = interest rate and $n$ = amortization period
Annual Capital Cost	\$1,227,070	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$1,227,070</b>	Annual Capital Cost + Annual O&M Cost

*Table 3. Costs for Control Option #4a - SNCR and LNB on Both Units*

Item	Cost	Reference/Source
Annual O&M Cost	\$2,200,000	S&L Letter, Attachment #2
Capital Cost (Total)	\$26,000,000	Capital Cost of Control Option #3 in Table 2 + Capital Cost of SNCR in S&L Letter, Attachment #2
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$ where $i$ = interest rate and $n$ = amortization period
Annual Capital Cost	\$2,454,140	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$4,654,140</b>	Annual Capital Cost + Annual O&M Cost

**ATTACHMENT 1. BART CONTROL COST CALCULATIONS**  
**Salt River Project - Coronado Generating Station**

**Table 4. Costs for Control Option #4b - LNB on Unit 1, SCR and LNB on Unit 2**

Item	Cost	Reference/Source
Annual O&M Cost	\$1,100,000	Estimated to be Less than Half of Cost for Control Option #5 in Table 5
Capital Cost (Total)	\$79,000,000	Half of Capital Cost of SCR in S&L Letter, Attachment #2 + Capital Cost of Control Option #3 in Table 2
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$ where i = interest rate and n = ammortization period
Annual Capital Cost	\$7,456,810	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$8,556,810</b>	Annual Capital Cost + Annual O&M Cost

**Table 5. Costs for Control Option #5 - SCR and LNB on Both Units**

Item	Cost	Basis/Reference
Annual O&M Cost	\$3,400,000	S&L Letter, Attachment #2
Capital Cost (Total)	\$145,000,000	Cost of SCR in S&L Letter, Attachment #2 + Capital Cost of Control Option #3 in Table 2
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$ where i = interest rate and n = ammortization period
Annual Capital Cost	\$13,686,550	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$17,086,550</b>	Annual Capital Cost + Annual O&M Cost

**ATTACHMENT 1. BART CONTROL COST CALCULATIONS**  
**Salt River Project - Coronado Generating Station**

*Table 6. Actual LNB Costs for Unit 1*

Item	Cost	Reference/Source
Annual O&M Cost	-	
Equipment Cost	\$7,500,000	
Installation Cost	\$10,000,000	
Testing, Controls, Engineering Cost	\$500,000	
Capital Cost (Total)	\$18,000,000	Equipment Cost + Installation Cost + Testing, Controls, Engineering Cost
Interest Rate	7%	EPA Air Pollution Control Cost Manual, Sixth Edition, EPA/452/B-02-001, January 2002, Pg. 2-13
Amortization Period	20 years	Estimated Economic Life of Plant
Capital Recovery Factor (CRF)	0.09439	$i/(1-(1+i)^{-n})$
Annual Capital Cost	\$1,699,020	CRF x Total Capital Cost
<b>Total Annual Cost</b>	<b>\$1,699,020</b>	Annual Capital Cost + Annual O&M Cost

**Attachment 2: Letter from Sargent and Lundy**



**Steven R. Bertheau**  
 Senior Vice President  
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June 25, 2009

Salt River Project

**Air Pollution Control Cost Estimates  
 Coronado Generating Station**

Mr. Grant Smedley  
 Senior Environmental Engineer  
 Salt River Project  
 Mail Station PAB 352  
 P O Box 52025  
 Phoenix, AZ 85072-2025

Dear Mr. Smedley:

Per your request, the following is a summary of the basis for the capital and operations and maintenance (O&M) cost estimates developed by Sargent & Lundy (S&L) in support of Salt River Project's (SRP) BART activities and our engineering work on SRP's Coronado Emissions Control Project (CECP).

The cost data shown below are the estimates that were developed for selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), and wet limestone scrubbers as of the dates used by SRP for purposes of their BART submittal to ADEQ in February 2008. The costs are total plant costs (i.e., for both units). It is important to note that these costs are not reflective of the current estimated costs for such work, as they do not include the significant escalation in commodity costs and other costs that have taken place since the time the estimates were developed.

**SCR ESTIMATE:**

The SCR cost estimate in SRP's BART submittal was based on conceptual design estimates and S&L's internal power plant cost database. The costs used in SRP's submittal were based on information developed by S&L as of March 2007. A breakdown of those figures is presented below.

Cost Component	Estimated Cost (\$M)	Notes
<b>Capital Total:</b>	<b>132</b>	<b>Est. as of March 2007</b>
• SCR	92.9	Reactor, NH3 storage/delivery system, ductwork, etc.
• BOP Items	6.4	Misc. piping, I&C, electrical
• Site Infrastructure	1.3	Civil work, lighting, etc.
• Other	19.3	Labor premiums, per diem, contractor profits, etc.
• Contingency/Indirect	12.5	Engineering, procurement, construction mgmt, startup, commissioning, etc.
<b>O&amp;M Total:</b>	<b>3.4</b>	<b>Est. as of March 2007</b>
• Variable O&M Total:	2.3	
▪ Reagent	1.1	NH3 @ \$ 400/ton
▪ Catalyst	0.5	\$ 7000/cubic meter
▪ Aux Power	0.7	\$ 60/MWh
• Fixed O&M Total:	0.1	

It should be noted that the Auxiliary Power and Fixed O&M costs noted above were adjusted down by SRP from the estimates originally provided by S&L.

**SNCR COST ESTIMATE:**

The SNCR cost estimates were developed in December 2007. The estimates (\$13 million capital and \$2.2 million/year O&M) were not based on any site specific engineering work and were simply "rule-of-thumb" estimates based on S&L's work on other projects.


**WET SCRUBBER COST ESTIMATE:**

The scrubber cost estimate in SRP's BART submittal was based on site specific engineering for Coronado as of August 2007, and some adjustments by SRP in October 2007 for updated pricing obtained for the chimneys and other items. At that time, several major components were out for bids, including the absorber islands and chimneys. The estimate, however, did not include escalation or contingency. An approximate breakdown of the costs is as follows:

Cost Component	Estimated Cost (\$M)	Notes
<b>Capital Total:</b>	<b>347</b>	<b>Est. as of August 2007</b>
• Limestone Handling	3.5	Limestone conveyance and storage systems
• Reagent Prep	2.1	Limestone grinding changes
• Absorber System	121.3	Vessel, slurry pumps, ox air, etc.
• Dewatering	0.3	
• Sludge Disposal	0.3	
• Flue Gas System	14.7	Ductwork
• Chimneys	42.2	
• Fans	18.9	ID Fans
• BOP Piping	10.8	
• Heat Tracing	0.7	
• Electrical	18.6	
• I&C	5.2	DCS, etc.
• Demolition	3.7	
• Site Infrastructure	5.9	Civil work, lighting, etc.
• Other	59.8	Labor premiums, per diem, contractor profits, etc.
• Spare Parts/Consumables	0.5	
• Indirect	38.5	Engineering, procurement, construction mgmt, startup, commissioning, etc.
<b>O&amp;M Total:</b>	<b>11.6</b>	
• Variable O&M Total:	8.5	
▪ Reagent	1.6	Limestone @ \$ 13.7/ton
▪ Waste	0.3	\$ 2/ton disposal
▪ Water	0.1	\$ 0.24/1000 gal
▪ Aux Power	6.5	\$ 60/MWh
• Fixed O&M Total:	3.1	

Please feel free to contact me at (312) 269-7716 if you have any questions.

Yours very truly,

  
for S.R. Bertheau  
S.R. Bertheau  
Project Director

SRB: dc  
Copies:  
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E. A. Shameem  
A. Patel  
Project File