Thorstenson, Craig D.

From: Archer, Greg GRE/MG [garcher@GREnergy.com]
Sent: Friday, September 19, 2008 12:06 PM
To: Thorstenson, Craig D.
Cc: Roth, Mary Jo GRE/MG; Smokey, Steve GRE/SS; jtrinkle@barr.com
Subject: Stanton Draft Reponses to Select EPA FLM Comments
Attachments: 080918 draft Stanton BART responses to FLM.doc

Craig,

Here are Stanton's Draft Responses to the EPA FLM comments. Please take a look and let me know if any areas need more or less information. I will be out of the office thru Wednesday next week and will respond upon return.

Also, we would like to meet the department in the next few weeks to discuss long term options for Stanton. I would suggest sometime after Oct 2. Please let me know availability from your end and I will try to match schedules on ours.

Thanks in advance!

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DRAFT Responses – 9/19/08

The Federal Land Managers and EPA recently commented on the State's Draft BART SIP and Stanton's Draft Permit-to-Construct, which incorporates the State's proposed BART limits. In response to certain EPA/FLM questions, GRE provides the following responses, at the request of NDDH.

EPA NOx Comment 48 (B) – "The State's proposal of LNB+OFA+SNCR is commendable since it goes beyond what can be achieved with just combustion controls. However, the BART limit should be tightened since current (pre-BART) emissions using PRB coal at Stanton are already very close to the proposed limit (0.26 lb/mmbtu vs. 0.23 lb/mmbtu)"

GRE Response – As discussed in Stanton's BART analysis, there are several justifications for the proposed NOx limits. While it is true that Stanton has hit roughly 0.26 lb/mmbtu NOx as an annual average, this emission rate must be viewed within the context of Stanton's operational configuration and with respect to the BART limit that is expressed as a 30-day rolling average, inclusive of startup and shutdown emissions.

In terms of operational justifications for a higher NOx emission rate, there are many. First, NOx emissions are impacted by variable load operations over shorter averaging periods. Under normal station operating conditions, Unit 10 is run at full utilization while Unit 1 varies (swings) to meet Midwest Independent System Operators (MISO) power demands. Unit 1 has a wider load range than Unit 10 to swing to meet load. (As the larger unit, Unit 1 swings rather than Unit 10 because of back draft problems that can cause Unit 10 to trip.) On PRB, Unit 1 only needs to operate 2 of its 3 mills at any time to follow load. So, by rotating the 2 mill configuration over a year, they have demonstrated an ability to operate at 0.26 lb/mmbtu as an annual average. Again, short term operational variability is muted as an annual average, but becomes more of a concern over shorter term compliance limits such as 30 days.

Specifically, Stanton rotates mill operation so that they all wear equally. However, if the lower mill is out-of-service, the upper two mills must support the load. The lower mill can have a mechanical breakdown, which requires it to be taken out of service. Therefore, over shorter term averaging periods, NOx emissions will be higher while running on the two upper mills.

Second, if Unit 10 trips due to a tube leak or other maintenance problem, Unit 1 needs to operate all three mills in order to fully supply steam to the single turbine. Under the three mill operational scenario, NOx emission rates are higher than two mill operation. Depending on the extent of the unplanned Unit 10 outage, it is possible for Unit 1 to operate on all three mills for as much as 30-days.

Third, nitrogen can vary by coal type, which will impact NOx emissions. Fuel bound nitrogen association with the range of lignite and PRB coals available to Stanton was inherently included in the safety factors that were applied to the Alstom target emission rates.

As discussed in the Alstom NOx Evaluation (Stanton BART Analysis Appendix D) and as discussed in Section 4.3 of Stanton's BART Analysis. The proposed BART limits are reflective of these operational scenarios.

EPA Wet Scrubber Comment 45 – "A wet scrubber was eliminated from consideration based on environmental considerations, but it is not clear how significant these other considerations and why they were not important at other plants."

GRE Response – In addition to cost effectiveness and incremental deciview arguments described in Stanton's BART analysis, there are other environmental considerations that would also support ruling out a wet scrubber as BART. Most importantly, Stanton Station, unlike other plants in ND, currently has a spray dry baghouse on its Unit 10. Therefore, in addition to other environmental considerations described below, there are significant operational efficiencies associated with installing another spray dry baghouse on Unit 1.

Site Constraints – Stanton Station is located on the Missouri River, which is immediately north of the plant, and is bounded by the state highway on the south. Basin Electric is located immediately east and Coyote Pump house and existing rail lines constrict the western boundary. See BART Analysis Appendix G – Site Diagram. There are realistically only two potential areas on site that could be considered for the additional ponding associated with a wet scrubber. They are either, the existing ash pile, which would need to be excavated and moved, or the abandoned ash disposal area adjacent to the river, which reportedly has geotechnical deficiencies. The levee along this area had started to erode, which instigated the abandonment of the Old Ash Disposal Area.

Water Use – The wet scrubbing technology will use more water than dry scrubbing. According to Washington Group's preliminary estimates, wet scrubbing can use as much as 20% more water or approx. 15MM gallons/yr. Since water use in the western United States has been and will continue to be a contentious issue, the plant must be cognizant of it as a resource use. Further, with respect to Clean Water Act 316(b) requirements, an increase in water withdrawal may trigger alternative cooling water intake requirements such as cooling towers. These additional costs were not fully incorporated into the analysis, but present other environmental considerations and regulatory risks as part of the BART analysis.

Wastewater Discharge – It is assumed that a wet scrubber system would require additional on-site ponding. Again, it is important to note the site diagram and the proximity to the river. Although there appears to be an available area immediately adjacent to the river, this area is geologically unsound for scrubber sludge ponding. Since a comprehensive geological site assessment including structural improvements and pond lining was not completed, this item was listed as a non-air quality environmental consideration. Any wastewater generated by wet scrubbing is expected to have concentrations that may require further on-site treatment prior to discharge. Finally, once mercury controls are installed, it is logical to assume that some mercury will be transferred to the wastewater ponds and treatment system, which will prove problematic for discharge.

Operational Efficiencies with Dry Scrubbing Technology – Stanton Station Unit 10 currently has a spray dry baghouse to control SO2. The plant is very familiar with this technology. There are cost savings associated with lime handling, ash handling and operator coverage if an additional spray dry baghouse combination is installed on Unit 1.

Pending Mercury Air Emission Controls – For almost 10 years, Stanton has consistently conducted mercury reduction research in conjunction with EPRI, EERC, DOE, NDIC, LEC and others. This research has not only supported national efforts to reduce mercury through the development of improved carbons, but it has provided plant specific mercury control information that will be used to comply with CAMR, if re-instated, or MACT requirements when promulgated. A great deal of Stanton's research was conducted with the Unit 10 spray dry baghouse. It is clear that spray dry baghouse with carbon injection combinations work substantially better than wet scrubber mercury controls, especially on western coals, like PRB and Lignite, that have a higher elemental mercury percentage. If a wet scrubber technology were required, Stanton would have to work much harder to remove the same amount of mercury from the exhaust gas. Further, there would be wastewater issues associated with mercury, and other exhaust gas constituents as mentioned. .

In addition to cost effectiveness and incremental deciview arguments in Stanton's BART analysis, it is the combination of these other environmental considerations that support our proposed BART controls and associated emission rates.

EPA Comments 44, 45 and 46– "We believe that the 'inferior' control technology proposed for Stanton Unit 1 (spray dryer/fabric filter) coupled with, what we find to be, an inflated uncontrolled emission rate, produces too high of an SO2 limit (0.24 for lignite and 0.16 for PRB)."

'Inferior' Control - Stanton Station has completed a BART analysis for SO2 controls that includes wet scrubber, spray dryer/fabric filter, dry sorbent injection and other SO2 controls. According to the five factor analysis, the spray dryer/fabric filter was determined to be the most appropriate control to cover the range of permitted fuels and sulfur contents.

As discussed in Section 5.1 of Great River Energy's Stanton Station BART Analysis (Rev Jan 2008), the plant is currently permitted for both PRB and Lignite coals. The current fuel contract expires in November 2009 and the plant is evaluating several coal suppliers. Appendix E of Stanton' BART analysis provides detailed discussion for some future coals and their potential uncontrolled sulfur emissions.

As one example, Stanton Station recently completed a test burn of Absaloka PRB. According to the CEMS data (See Table), there was significant hourly variability associated with sulfur emissions from one train of the Absaloka. We do not have enough familiarity with the Absaloka or the Rosebud Mine plans in order to speculate on future sulfur content or consistent sulfur content within deliveries over a 30 day period. Although limited, the CEMS data for part of trial burn is supportive of NDDH's uncontrolled emission calculations, which was actually based on the higher sulfur Rosebud Mine. The NDDH proposed SO2 PRB emission rate is reflective of these prospective fuel options and sulfur uncertainties.

As described in Appendix E of the Stanton's BART analysis, the nearest active lignite mine on Stanton's side of the Missouri River is at Minnkota's plant. Sulfur emission rates were derived from this mine as representative of uncontrolled emissions associated with a prospective lignite fuel source. Although different than historical lignite emission rates, it is reflective of the most probable lignite fuel available to Stanton at this time.

Absaloka SO2 CEMS Data

Average	1.30
Minimum	0.89
Maximum	2.12
Summation	124.66
Included Data Points	96
Total number of Data Points	96

Additional GRE Comments on 5/29/08 Draft Permit to Construct

General Information Section C) Owner/Operator address should be updated to 12300 Elm Creek Blvd, Maple Grove, MN 55369-4718

Permit Conditions A.3 – CEMS – The monitoring location is listed as (Main Stack). However, Unit 1 currently monitors both the East and West ducts. With the scrubber installation, the monitoring location is likely to change.