United States Department of the Interior

NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225

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IN REPLY REFER TO:

January 8, 2010

N3615 (2350)

Mr. Terry L. O'Clair, P.E.
Director
Division of Air Quality
North Dakota Department of Health
Environmental Health Section
918 E. Divide Avenue
Bismarck, North Dakota 58501-1947

Dear ~~Mr. O'Clair~~ Terry:

We appreciate the effort you and your staff have devoted to responding to the comments we provided during consultation on your State Implementation Plan (SIP) revision to address regional haze requirements of 40 CFR 51.300-308. However, after reviewing your "Response to DOI Comments" document, we believe that there are still some outstanding issues that warrant further consideration as you prepare the SIP revision for submittal to EPA Region 8. Specifically, we still contend that Theodore Roosevelt National Park (NP) should be treated in all impact assessments as one Class I area (not three separate areas), and that additional controls (e.g., Selective Catalytic Reduction) is Best Available Retrofit Technology (BART) for some BART-eligible units. Our follow-up comments are discussed in more detail below and in the enclosed document.

Treatment of Theodore Roosevelt NP

We appreciate your acknowledgement that Theodore Roosevelt NP is only one Class I area under the Clean Air Act. However, we disagree that units of the park can be separated when assessing visibility impairment for the purposes of determining if an existing source causes or contributes to visibility impairment under the Regional Haze Rule. Your response cites the definition of "adverse impact on visibility" which is a definition that applies for assessment under Section 51.307 regarding impacts of new sources. For purposes of applying Best Available Retrofit Technology (BART) to existing sources, or determining if an existing source

could be controlled to aid in "reasonable progress" toward the national visibility goal of no human-caused impairment, a State should consider if a source contributes to "visibility impairment." Section 51.301 (x) defines visibility impairment as "any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under natural conditions." U.S. Environmental Protection Agency rules for applying BART establish a test for "contribution" of sources as 0.5 deciview impact for the 98th percentile day over a three-year period. That impact applies to all locations (i.e., receptors) within a Class I area for the modeled three-year period. In the case of Theodore Roosevelt NP, modeling receptors are only located within the boundaries of the three individual units of the Class I area. Since lands outside of the Class I area are not included in assessing the 0.5 deciview impact, there is no misrepresentation of impacts for park visitors, and there is no extension of Class I status to areas outside of the park.

If receptors within the total park boundary show 0.5 or more deciview impacts (98th percentile day) over the three-year period, a BART-eligible source's emissions contribute to "visibility impairment" and must be assessed under EPA's regional haze BART guidance. We believe that this test is useful for any stationary source to identify those sources or groups of sources that should be evaluated for reasonable progress as well.

Best Available Retrofit Technology (BART) Analyses

We have reviewed the responses you provided to our comments on assessing BART controls. The enclosed follow-up comments supplement the concerns we have raised in light of your responses.

We have received a letter dated December 21, 2009, regarding new results of air quality modeling to determine if the Heskett Power Plant is subject to BART. We are coordinating with U.S. EPA Region 8 staff in their efforts to verify the new modeling results. Pending the outcome of the review, we may provide additional comments on these new modeling results.

Finally, we have recently become aware that Regenerative Selective Catalytic Reduction (SCR) is an available technology that is applicable to Electric Generating Units and has the potential to allow SCR to be installed on a relatively cool gas stream (e.g., following a scrubber) with relatively little auxiliary heat required. The primary drawbacks to this Regenerative SCR are the capital cost and space requirement, but this technology warrants further evaluation as possible BART for North Dakota sources.

Again, we appreciate your State's efforts to build a foundational SIP for the purposes of addressing regional haze and visibility protection in general for our national treasures. We look forward to working with the State to continue progress toward the national visibility goal.

Sincerely,

for Christine L. Shaver
Chief, Air Resources Division
National Park Service

Sincerely,

Sandra V. Silva
Chief, Branch of Air Quality
U.S. Fish & Wildlife Service

Enclosure

cc:
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Department of the Interior (DOI) Follow-up Comments on North Dakota Department of Health (NDDH) Best Available Retrofit Technology (BART) Analyses
January 8, 2010

DOI Comment 6: (Purpose of the BART Program)
The core purpose of the BART program is to improve visibility in our Class I areas. BART is not necessarily the most cost-effective solution. Instead, BART represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. We believe that it is essential to consider both the degree of visibility improvement in a given Class I area as well as the cumulative effects of improving visibility across all of the Class I areas affected.

NDDH Response: In determining BART, visibility improvement was generally not weighted as heavily as the cost of compliance because we believe the single source modeling required by the BART guideline does not give a true representation of the degree of improvement in visibility **which may reasonably be anticipated to result from the use of the technology**.

We believe the cumulative visibility effects analysis promoted by DOI is scientifically unsound and not in accordance with rule or law. Adding the maximum improvement value (or 98th percentile) at one Class I area to the maximum improvement at another Class I area does not account for these maximums happening at different times. In addition, DOI has not defined which Class I areas should be added together to achieve the cumulative impact. This makes the analysis arbitrary. The single source modeling under BART does not provide a realistic estimate of visibility improvement of a given technology. Creating a "cumulative effects" analysis based on the flawed BART analysis only compounds the inaccuracy and misleads the reader of the SIP.

In addition, the BART Guideline only requires an evaluation of the change at each receptor. It does not require adding these changes together.

DOI Follow-up: In light of the NDDH's perceived problems with the suggested DOI approach, the NDDH should explain how it considered the benefits of reducing emissions with respect to visibility improvements at multiple Class I areas.

DOI Comment 8: The ability of SCR to reduce emissions, as assumed by NDDAQ, was inconsistent and sometimes underestimated.

NDDH Response: In the ANPR for the Four Corners Power Plant (Federal Register 8/28/09) EPA states "APS estimated that SCR could achieve NO_x control of approximately 90% or greater from the baseline emissions. For new facilities, 90% or greater reduction in NO_x from the SCR can be reasonably expected. See May 2009 White Paper on SCR from Institute of Clean Air

Companies. For SCR retrofits on an existing coal-fired power plant, Arizona Department of Environmental Quality (ADEQ) determined that 75% control from SCR (following upstream reductions by LNB) was appropriate for the Coronado Generating Station in Arizona. Based on this data, EPA has determined that an 80% control efficiency for SCR alone, rather than the 90+% control assumed by APS, is appropriate". The Department believes 80% is a reasonable estimate that allows the source to comply with the expected emission limit on a continuous basis.

DOI Follow-up: We have advised EPA Region 9 that it has underestimated the ability of SCR to reduce NO_x emissions from the sources in question and supported our comments with real-world data from actual retrofits to coal-fired EGUs. Our comments can be found in the same docket accessed by NDDH.

DOI Comment 9: The cost of SCR was consistently overestimated.

NDDH Response: The DOI used the EPA Air Pollution Control Cost Manual (February 1996) to estimate the capital cost and operating costs for the SCR system. The DOI did not use the most current version of this manual which is dated January 2002.

DOI Follow-up: We used the current version of the Cost Manual as it pertains to SCR.

NDDH Response: The EPA Air Pollution Control Cost Manual (both versions) is significantly out-of-date for estimating costs for SCR. This can be seen from the recently published results of EPA's review of the Four Corners Power Plant BART analysis. In the Advanced Notice of Proposed Rulemaking (August 28, 2009), EPA published the Consultant's, EPA's and the National Park Service's estimate of the cost for NO_x controls.

DOI Follow-up: We have advised EPA Region 9 that it has overestimated the cost of SCR to reduce NO_x emissions from the sources in question. Our comments can be found in the same docket accessed by NDDH.

NDDH Response: It would appear the NPS is underestimating annualized SCR costs by as much as a factor of 6 and cost effectiveness by as much as a factor of 3. The discrepancy between the annualized cost and the cost effectiveness is apparently due to the NPS overestimating the effectiveness of SCR. Based on this apparent underestimation, it appears the costs provided by the consultants and the Department's estimates are similar to EPA estimates and are reasonable. Any estimate by the FLM of cost on a dollar per deciview basis would be similarly flawed.

DOI Follow-up: NDDH should conduct an independent analysis by applying the EPA-recommended OAQPS Control Cost manual.

NDDH Response: As pointed out earlier, the OAQPS Control Cost Manual is out-of-date. EPA accepted estimates based on the CUE Cost Model for the Four Corners Power Plant BART analysis. Since the OAQPS Control Cost Manual is out-of-date and drastically underestimates control costs, we believe the CUE Cost Model provides a more realistic estimate of the costs.

DOI Follow-up: EPA Region 8 recommended that NDDH use the OAQPS Control Cost manual, and we support the EPA position on this matter.

DOI Comment 10: (Step 5: Visibility Improvement)
A) DOI believes it is appropriate to consider both the degree of visibility improvement as well as cumulative effects.
B) DOI is concerned that the Department did not provide the total improvement for each BART option.

NDDH Response: The total improvement under BART is not the best metric for addressing visibility associated with each option since the single source modeling under BART over predicts (by a factor of 5-7) the actual improvement in North Dakota. Incremental differences in improvement provides an easy way to evaluate the visibility improvement benefits of one option over another. The difference is equivalent to the total improvement of one option minus the total improvement of the other option. Providing the total improvement will mislead the reader of the SIP because of the over prediction. However, this information can be extracted from the analyses conducted by the operators of the BART sources. .

DOI Follow-up: NDDH is placing too much emphasis upon incremental differences; NDDH should provide the total improvement. In addition, we do not understand how NDDH can claim that the BART modeling over predicts (by a factor of 5-7) because in the Leland Olds Station Unit 1 and 2, and the Milton R. Young Unit 1 and 2 BART protocols, NDDH itself states: "The NDDH modeling protocol recommends a specific version of the CALPUFF modeling system as modified by the NDDH to specifically address terrain, climate, and emission characteristics of LOS / MRYS. ... The input files contained the specific coordinate grid points, wind field options, terrain, dispersion options, receptor coordinates and plume characteristics and other model parameters that the NDDH has determined best represents the region. The NDDH version of CALPUFF was used for modeling." Therefore, NDDH should support its claims that "the single source modeling under BART over predicts (by a factor of 5-7) the actual improvement in North Dakota."

DOI Comment 10: C) DOI is concerned about the difference in their modeling for Leland Olds Unit 2 and the Department's and Basin Electric's modeling results (the latter two sets of results agree closely).

NDDH Response: There are bound to be differences in modeling results when different model settings and options are used as well as different receptor grids. One error noted in the DOI modeling results was the input for the maximum 24-hour SO_2 emission rate for Unit 2. DOI used 17,610 lb/hr plus 1,581 lb/hr for sulfate. Unit 2 had a maximum 24-hour SO_2 (includes SO_4) of 12,205 lb/hr during the baseline period (2000-2004). DOI apparently used an SO_2 + SO_4 emission rate based on maximum future sulfur content. This is incorrect since current visibility conditions (12,205 lb/hr) are compared to conditions after controls are applied. The BART Guideline states "Use the 24-hour average actual emission rate from the highest emitting day of the meteorological period modeled (for the pre-control scenario)". The meteorological data used by the Department is from 2000-2004. Use of potential future uncontrolled emissions for the precontrol scenario is inconsistent with the BART guideline. The Department also noted that this error carried over into the emission rates for other pollutants. This error will provide a much greater improvement in visibility as found by the DOI.

DOI Follow-up: We agree with NDDH's method of assessing future emissions and control costs and effectiveness based upon anticipated changes in coal quality. We, therefore, believe that it is appropriate to model changes in visibility impairment on the same bases. The SO_2 emission rate was provided by Basin Electric in "Table 1.3-2 – Leland Olds Station Future PTE Emissions for BART Analysis". The sulfate emissions were derived from our PM speciation workbook and account for all condensible inorganic emissions. We invite NDDH to discuss this matter further.

DOI Comment 11: It appears to be more beneficial to reduce NO_x than to reduce SO_2 in this cool climate.

NDDH Response: The Department does not necessarily agree with this statement. There are situations in North Dakota where reduction in NO_x has very little impact on visibility. This can be seen from the AVS I analysis. A 65% reduction NO_x (2,356 tpy) only provided a 0.01 deciview improvement in the average of the 20% worst days.

DOI Follow-up: AVS 1 was not subject to BART, and thus not reviewed in that context. If one considers the relative visibility benefits of reducing SO_2 versus NO_x (on a per-ton basis) <u>at a given EGU that was subject to BART</u>, it appears to be more beneficial to reduce NO_x than to reduce SO_2 in this cool climate.

DOI Comment 12: DOI recommends more emphasis on the dollar per deciview metric.

NDDH Response: There was no established data base for this metric when the BART analyses were developed and when the Department was making its decisions. Even the DOI's data is not very useful since the EPA has not approved the BART determinations in that database. Again,

the single source modeling does not reflect the true visibility improvement. It may be more realistic in some states than in others. Therefore, the comparison of $/deciview in North Dakota to $/deciview in another State is not an apples-to-apples comparison. The Department has considered the incremental visibility improvement between BART options. We believe this is the best metric given the limitations of single source modeling to provide realistic estimates of visibility improvement.

DOI Follow-up: NDDH has placed too much emphasis upon incremental differences and should explain what benchmarks or thresholds it used to make its decisions. As for the differences among state modeling procedures, the cost-per-deciview criterion we have suggested is simply the estimated cost divided by the estimated improvement—how that value is derived is irrelevant in this context—it is how the value is used that matters.

DOI Comment 13: For several units, NDDOH is proposing alternative sulfur dioxide (SO_2) limits that are similar to the presumptive BART limits because they allow a source to choose between a limit in terms of pounds of emissions per million Btu of heat input, or percent reduction of that pollutant. While EPA presented its BART Guidelines for SO_2 in that format, we do not believe that it was EPA's intention to allow the source to choose the more favorable limit. By definition, BART represents the highest degree of control that meets the five-factor test. Where NDDOH has determined that a lb/mmBtu limit is reasonable, it should require that that limit be met.

Similarly, where NDDOH has determined that a percent reduction limit is reasonable, it should require that that limit be met. If both limits are determined to be reasonable, then to allow the source to choose only one clearly does not represent the most stringent reasonable degree of control. Therefore, where NDDOH has proposed alternative limits, both should be required.

NDDH Response: The DOI has requested that the sulfur dioxide limitations be written as 95% reduction and 0.15 lb/10^6 Btu instead of 95% reduction or 0.15 lb/10^6 Btu. Coal quality data suggests that the source may not be able to comply with the 0.15 lb/10^6 Btu limit when the maximum sulfur coal is received. This would make the requested standard impossible to meet for high sulfur coal. The BART guidelines (40 CFR 51, Appendix Y, Section IV.E.4) states "you must require 750 MW power plants to meet specified levels of SO_2 of either 95 percent control or [emphasis added] 0.15 lb/10^6 Btu". The guidance does not indicate both standards apply. In addition, the BART presumptive levels are not applicable to any source in North Dakota except for NO_x at Coal Creek Station.

DOI Follow-up: There is also a fundamental problem with setting only a percent-reduction limit on SO_2 emissions. If fuel sulfur content increases, emissions can increase correspondingly. Unless sulfur content is limited, or a cap is placed on mass emissions (e.g., lb/hr, tons/yr as proposed by Wyoming, for example), the actual amount of SO_2 emitted is unlimited.

NDDH Response: The DOI has also asked that a mass per unit of time limit be placed on the permit for SO_2. The Department believes this is unnecessary since the Department's evaluation of visibility impacts was based on full load and worst case sulfur (i.e. highest 24-hour emissions). The Department asked the EPA if a mass per unit of time limit (24-hour basis to ensure the accuracy of the modeling) was necessary in the permit that establishes the BART limits. In a November 21, 2005 response from Laurel Dygowski of Region 8, it was stated "we think that a 24-hour limit is unnecessary and may not be of much value". Based on EPA's guidance and the Department's determination that mass per unit of time units are not necessary, the Department will not include such limits in the permit that establishes the BART limits.

DOI Follow-up: As we noted previously, even if coal quality deteriorates to the anticipated worst-case, the proposed control technology would still be capable of meeting the lower lb/mmBtu limit.

DOI Comment 25: On page 16 of the comments, the DOI states, "We believe that higher control efficiency is warranted for both the lignite and PRB sub-bituminous scenarios". The DOI goes on to state that a facility burning coal with an uncontrolled SO_2 emission rate of 2.4 lb/MM Btu for lignite and 1.6 lb/MMBtu on PRB "should be capable of at least 93% control and achieve an emission limit of 0.09 lb/MMBtu on a 30-day rolling average basis[11]". Footnote 11 in the DOI comments states, "Please see the entry in Appendix D for the permit issued by Wyoming to Black Hills Power for its WYGEN3 project".

NDDH Response: The DOI states a SD/FF at Stanton #1 "should be capable of" at least 93% control and an emission limit of 0.09 lb/MMBtu on a 30-day rolling average basis. The DOI attempts to support this position by referencing the WYGEN3 facility permit. Although the WYGEN3 facility does have a 0.09 lb/MMBtu SO_2 emission limit, according to the EPA RACT/BACT/LAER clearinghouse, the 0.09 lb/MM Btu SO_2 emission limit is on a 12-month rolling average basis, not a 30-day rolling average basis. Also, the RACT/BACT/LAER clearinghouse does not list a required SO2 removal efficiency. If the WYGEN3 facility burns low-sulfur coal, the facility could comply with the 0.09 lb/MMBtu emission limit with SO_2 control efficiencies below 90%. Furthermore, it is the Department's understanding that the WYGEN3 facility has yet to operate and demonstrate that the SO_2 emission limit can be achieved. Based upon these facts, the WYGEN3 facility permit does not support the DOI position that a SD/FF at Stanton Station Unit 1 "should be capable of" at least 93% control and

an emission limit of 0.09 lb/MMBtu on a 30-day rolling average basis. The Department maintains the position that a SD/FF operating at Stanton Station Unit 1 is capable of achieving an SO_2 control efficiency of 90%.

DOI Follow-up: The WYGEN3 permit[1] limits the EGU to 117 lbSO_2/hr on a 30-day rolling average basis. At a heat input of 1,300 mmBtu/hr, this corresponds to 0.09 lb SO_2/mmBtu on a 30-day rolling average.

DOI Comment 26: On page 16 of the DOI comments, the DOI states, "Because the larger Stanton Unit #10 also located at this site is achieving less than 0.06 lb/MMBtu on an annual basis (presumably burning PRB coal) using the same SD/FF technology proposed for Stanton Unit #1, NDDAQ should explain why a newer installation of that technology at Stanton #1 cannot perform as well, at least on PRB coal".

NDDH Response: The DOI incorrectly states that Stanton #10 is larger than Stanton #1. In fact, Stanton #10 (with a heat input of approximately 642 MM Btu/hr) is approximately 2.8 times smaller than Stanton #1 (with a heat input of approximately 1,800 MM Btu/hr). The DOI states that Stanton #10 emitted SO_2 at an emission rate of 0.06 lb/MM Btu and asks the Department to explain why Stanton #1 cannot perform as well as Stanton #10 when burning PRB coal. Although the Stanton #10 facility has recently emitted SO_2 at an emission rate of 0.06 lb/MM Btu, based upon the average sulfur content of the coal burned the SO_2 removal efficiency at Stanton #10 is estimated to be approximately 90%. The dry scrubber technology proposed as BART for Stanton #1 is expected to achieve an SO_2 control efficiency of 90%, so Stanton #1 will be expected to perform as well as Stanton #10.

DOI Follow-up: We appreciate NDDH's correction of our error with respect to the relative sizes of the two EGUs. However, this does not change our contention that Stanton #1 should be able to perform as well as Stanton #10, both on lb/MMBtu and control efficiency bases. NDDH should show how it arrived at the conclusion that "based upon the average sulfur content of the coal burned the SO_2 removal efficiency at Stanton #10 is estimated to be approximately 90%."

DOI Comment 29: On page 17, the DOI states, "We believe that NDDAQ should have included SOFA with tail-end SCR with reheat in its analysis".

NDDH Response: The Department analyzed SCR with reheat in the BART analysis. A 90% control efficiency for SCR with reheat was assumed. For retrofits, the Department believes that a 90% control efficiency for SCR with reheat is highly optimistic and that 80% control is

[1] http://deq.state.wy.us/eqc/orders/Air%20Closed%20Cases/07-2801%20Dry%20Fork%20Station/DEQ's%20Dispositive%20Response.63-Ex.16.pdf

reasonable. It should be noted that conducting the BART analysis using an 80% control efficiency would make the cost of SCR with reheat even more cost prohibitive.

In the Department's judgment, SOFA with SCR with reheat would not attain greater than 90% NO_x control at Stanton #1. Since SOFA with SCR with reheat would be more expensive than SCR with reheat (which has already been determined to be cost prohibitive assuming a 90% control efficiency), it can be concluded that an analysis of SOFA with SCR with reheat would also be considered to be cost prohibitive.

DOI Follow-up: NDDH cannot assume that "SOFA with SCR with reheat would be more expensive than SCR with reheat" on a total annual cost basis without doing a proper cost analysis. It is possible that the additional capital cost (on an annual basis) of adding SOFA would be more than offset by reduced annual operating costs.

DOI Comment 30: On pages 18 and 20 the DOI indicates that the expected costs for SCR with reheat included in the BART analysis for Stanton #1 are higher than the cost estimates prepared by the DOI. The DOI requests that NDDH document and justify the SCR-with-reheat cost estimate.

NDDH Response: The DOI requests that the Department document and justify the SCR with reheat cost estimate for Stanton #1. The Department considers the cost estimate of SCR with reheat submitted with the GRE BART analysis to be extensively documented and the Department has verified the cost estimates.

DOI Follow-up: NDDH should explain how it "verified the cost estimates".

DOI Comment 34: DOI believes SOFA + SCR can achieve 83% NO_x removal.

NDDH Response: As pointed out in the Advanced Notice of Proposed Rulemaking for the Four Corners Power Plant, the Arizona DEQ determined that 75% control was appropriate following low NO_x burners at the Coronado Generating Station. Leland Olds 1 is equipped with low NO_x burners. We believe 75% reduction for the retrofit of a 43 year old plant is appropriate. Reducing the emission rate to 0.05 lb/10_6 Btu achieves 212 tons per year additional NO_x reduction. The cost effectiveness is then $8,888/ton to $12,784/ton. These costs are still considered excessive and SCR + SOFA is not BART.

DOI Follow-up: We have advised EPA Region 9 that it has underestimated the ability of SCR to reduce NO_x emissions from the sources in question and supported our comments with real-world data from actual retrofits to coal-fired EGUs. Our comments can be found in the same docket accessed by NDDH. Furthermore, NDDH cannot simply halt the BART

process by determining that a technically feasible option is too expensive on a cost-per-ton basis. A full five-factor BART analysis is required.

DOI Comment 35: NDDAQ did not evaluate the visibility benefits of any of the technically feasible options except for the proposed basic SOFA + SCR.

NDDH Response: The cost analysis eliminated SCR, coal reburn + SCR, coal reburn + SOFA and SNCR + boosted SOFA on either a very high cost effectiveness basis or a very high incremental cost basis. This left SOFA + SNCR as the most efficient control option. This option was then modeled to determine the visibility effects.

DOI Follow-up: NDDH cannot simply halt the BART process by determining that a technically feasible option is too expensive on a cost-per-ton basis. A full five-factor BART analysis is required.

DOI Comment 37: Based upon NDDAQ's analysis, addition of the proposed basic SOFA+SNCR to LOS #1 yields a cost-effectiveness of $25.6 million per dv at Theodore Roosevelt NP and $13.2 million per dv cumulatively when Lostwood WA is included. NDDAQ has not adequately considered the visibility benefits of the control strategies it evaluated. NPS' analysis of addition of basic SOFA+SCR with reheat yields a cost-effectiveness of $12.6 – $32.3 million per dv cumulatively. We would normally consider costs above $20 million/dv to be above the average that most states/source are proposing, but believe that these results warrant further analysis, as we will discuss in more detail with respect to LOS #2.

NDDH Response: SOFA + SCR has an estimated cost of $8,888 - $12,784/ton of NO_x removed. The incremental cost would be approximately $15,748/ton to $25,319/ton over the next most efficient option. It is clear that SOFA + SCR, or SCR alone, is not cost effective for this unit.

DOI Follow-up: NDDH cannot simply halt the BART process by determining that a technically feasible option is too expensive on a cost-per-ton basis. A full five-factor BART analysis is required.

<u>M.R. Young Station Unit 1</u>

DOI Comment 49: NDDAQ proposes that NO_x emissions be limited to 2,070.2 lb/hr on a 24-hour rolling average basis during startup. We recommend that NDDAQ limit the mass emission rate (e.g., lb/hr) to the rate under normal operation.

NDDH Response: The proposed limit is under normal operating conditions without the ASOFA and SNCR, since the SNCR cannot be operated until the proper boiler temperature is reached. The actual startup emissions will be much higher (>1.0 lb/10^6 Btu). Therefore, limiting startup emissions based on normal operations with SNCR (<0.35 lb/10^6 Btu) will provide no relief to the source during startup.

DOI Follow-up: To clarify our initial comment, we are suggesting that NDDH limit emissions on a lb/hr basis (not lb/mmBtu) to a rate equal to the maximum lb/hr that would be allowed were MRYS #1 to meet its BART limit under normal operation (e.g., BART limit in lb/mmBtu * maximum allowable heat input in mmBtu/hr). Thus, as load (and furnace temperature) increases, the effectiveness of the NO_x control technology also increases so as to stay under the lb/hr limit.

DOI Comment 51: NDDAQ overestimated the costs associated with adding SCR. In the absence of supporting documentation by NDDAQ, we also estimated a total annual cost for ASOFA + SCR with reheat at $9.7 million and a corresponding cost effectiveness of $1,028 per ton.

NDDH Response: Minnkota has provided its own estimate of the cost of SCR as part of the BACT process under their Consent Decree. Minnkota's estimate has been included in the BART determination.

DOI Response: We have not had sufficient time to properly evaluate the materials posted on or after November 25, 2009, by NDDH.

<u>M.R. Young Station Unit 2</u>

DOI Comment 54: NDDAQ proposes that NO_x emissions be limited to 3,995.6 lb/hr on a 24-hour rolling average basis during startup. We recommend that NDDAQ limit the mass emission rate (e.g., lb/hr) to the rate under normal operation.

NDDH Response: See response to Comment 49.

DOI Follow-up: To clarify our initial comment, we are suggesting that NDDH limit emissions on a lb/hr basis (not lb/mmBtu) to a rate equal to the maximum lb/hr that would be allowed were MRYS #2 to meet its BART limit under normal operation (e.g., BART limit in lb/mmBtu * maximum allowable heat input in mmBtu/hr). Thus, as load (and furnace temperature) increases, the effectiveness of the NO_x control technology also increases so as to stay under the lb/hr limit.

DOI Comment 56: NDDAQ overestimated the costs associated with adding SCR. In the absence of supporting documentation by NDDAQ, we estimated total annual costs for ASOFA+tail-end SCR with reheat at $15.6 million and a corresponding cost effectiveness of $898 per ton.

NDDH Response: Minnkota has provided a much more detailed cost estimate of SCR with reheat as part of their BACT process under their Consent Decree. This estimate has been used in the Department's BART determination.

DOI Follow-up: We have not had sufficient time to properly evaluate the materials posted on or after November 25, 2009, by NDDH.

DOI Comment 63: Table 9.9 summarizes the results of assessing the costs and visibility improvement associated with possible controls on these facilities. The two power generation facilities, Coyote and AVS, have emissions and Q/d impacts that are similar, if not greater than, BART sources that will be required to add controls. The methodology to calculate visibility improvements noted in Table 9.9 are not explained in this section but appear to be some calculation of changes in the long-term metric of the 20 percent worst visibility days. These sources likely contribute to higher impacts on a daily basis, and a reduction in their emissions would be part of a broad strategy to reach natural conditions at the Class I areas. As such NDDAQ should examine the total improvement from the suite of sources as part of its reasonable progress assessment, not a simple unit by unit approach.

NDDH Response: The improvement in the 20% worst days was used to indicate the amount of visibility improvement. The SIP was revised to better explain this. Addressing individual days under reasonable progress is inconsistent with the reasonable progress goals in 40 CFR 51.308(d)(1) which states "The reasonable progress goals must provide for improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period." 40 CFR 51.301 defines the most impaired days as meaning "the average visibility impairment (measured in deciviews) for the 20% of monitored days in a calendar year with the highest amount of visibility impairment." 40 CFR 51.301 defines the least impaired days as the average visibility impairment (measured in deciviews) for the 20% of monitored days in a calendar year with the lowest amount of visibility impairment." It is clear that reasonable progress goals should be established based on the average of the "most impaired days" and the "least impaired day", not individual days.

The Department did evaluate the cumulative effects of the most efficient remaining options. As stated on p. 182, the cumulative visibility improvement was 0.11 deciviews at LWA and 0.03 deciviews at TRNP. The less efficient control options would provide even less improvement.

DOI Follow-up: The use of daily impacts is a good means to identify those sources that have the largest impact on the 20 percent worst days. Since North Dakota is not meeting the uniform rate of progress for visibility improvement under EPA's guidance, it should seriously evaluate all significant sources of human-caused impairment. It is unclear if cumulative visibility improvement cited in the SIP included controls at Coyote and AVS.