

Response to Public Comments  
Supplemental Evaluation of  
NO<sub>x</sub> BART Determination  
Coal Creek Station Units 1 and 2

Purpose: This document responds to public comments that were received from October 1-30, 2012 regarding the North Dakota Department of Health's (Department) Supplemental Evaluation of the NO<sub>x</sub> BART determination for the Coal Creek Station Units 1 and 2.

Commentor: Martin Schock – The comments relate to the LCALGRD setting used in CALMET. Mr. Schock has questioned the use of the LCALGRD setting of “False” and asserted “deviations” from the federal and State Prevention of Significant Deterioration (PSD) rules.

The Department has demonstrated in its modeling analyses that the LCALGRD setting does not significantly change the amount of anticipated visibility improvement associated with emissions control scenarios (see Appendix D. of the Supplemental Evaluation). The “False” setting produced an overall average anticipated visibility improvement for SNCR plus LNC3+ versus LNC3+ for each individual unit of only 0.056 deciviews (98<sup>TH</sup> percentile). The “True” setting for LCALGRD produced an average anticipated visibility improvement of 0.044 deciviews (98<sup>th</sup> percentile). In either case, the amount of anticipated visibility improvement is well below 1.0 deciview which is generally accepted as the minimum amount of visibility improvement that is perceptible and well below the amount that is defined by NDAC 33-15-25 as contributing to visibility impairment (0.50 deciviews). Based upon the Department's review, the comment regarding the LCALGRD setting does not affect the Department's decision regarding the use of SNCR at the Coal Creek station since the amount of visibility improvement is so small when using either setting.

The PSD rules (NDAC 33-15-15) are not applicable to regional haze BART determinations. BART determinations are guided by NDAC 33-15-25, Regional Haze Requirements. NDAC 33-15-25 does not reference or rely upon the PSD rules.

Comment 1: The commentor indicated that the use of the “False” setting seems to conflict with the documentation for the BART modeling.

Response: The Department has reviewed the comments of Mr. Schock and determined that there is no conflict between the Department's BART modeling and the settings used. The Department conducted modeling for the Coal Creek Station NO<sub>x</sub> Supplemental BART determination once using the “False” setting and once using the “True” setting. The modeling results based on both “False” and “True” LCALGRD settings resolves any confusion on the intent of the BART modeling documentation.

BART analyses, other than the Coal Creek NO<sub>x</sub> analysis, are not the subject of this public comment period. The public comment period on all other Department BART determinations began more than two years ago and was completed as of November 21, 2011, the date that all public comments to the U.S. Environmental Protection Agency (EPA)'s proposed partial

approval and partial disapproval of North Dakota's Regional Haze State Implementation Plan were due. Therefore, the BART analyses for those sources are not addressed here.

Comment 2: The commenter questioned why the Supplemental Evaluation did not address the technical merits of the LCALGRD setting of "False" versus a "True" setting.

Response: The Department provided modeling results for the top two control technologies using an LCALGRD setting of "False" and also "True." In both cases, the visibility improvement of SNCR + LNC3+ versus LNC3+ was so small that SNCR was not warranted. Therefore, no explanation of the merits of the two settings was necessary. As EPA has made clear in the preamble to the BART Guidelines, States have considerable discretion in choosing how to apply the five BART factors, which include visibility improvement.

Comment 3: The commenter quoted a section of North Dakota's Prevention of Significant Deterioration (PSD) rules (NDAC 33-15-15). The commenter indicated that the Supplemental BART Evaluation did not address this requirement of the PSD rules.

Response: While the commenter is correct that the Supplemental Evaluation does not address the modeling requirements of NDAC 33-15-15, it is because NDAC 33-15-15 is not applicable to BART determinations. BART evaluations are governed by NDAC 33-15-25 which has no requirement that the PSD rules be consulted or applied.

Comment 4: The commenter suggested that the EPA/FLM modeling protocol to determine BART applicability for Heskett Station Unit 2 does not satisfy the requirements of NDAC 33-15-15-01.2.

Response: As discussed in the Response to Comment 1, the only BART determination noticed to the public and to which comments are being taken is the Coal Creek Station Units 1 and 2. The Heskett BART applicability modeling was not the subject of this public comment period and no response is required. However, again the commenter is quoting the PSD rules (NDAC 33-15-15-01.2) which are not applicable to BART determinations.

Comment 5: The commenter observed that the "False" setting of LCALGRD may not always provide more visibility improvement than the "True" setting.

Response: The Department agrees. For the Coal Creek Supplemental Evaluation, however, as set forth in Appendix D to the Department's analysis, the "False" setting did produce more anticipated visibility improvement than the "True" setting.

Commentor: Lafarge North America – The comments relate to the possibility of ammonia contamination from the use of SNCR.

Comment 1: Lafarge supported the Department's Supplemental Evaluation. Lafarge supported the Department's determination that the ash could be contaminated by ammonia from the use of SNCR and encouraged recycling of the ash. Lafarge stated "There will be lost fly ash due to the operation of SNCR, it is only a question of how much is lost."

Response: The Department believes it is reasonable to accept that Lafarge has experience in purchasing and handling fly ash from power plants. Lafarge indicates that it would expect some fly ash sales will be lost from the installation of SNCR. Lafarge's comments, based on their experience, substantiate the Department's determination that fly ash sales will be lost at the Coal Creek Station if SNCR is required.

Commentor: U.S. Fish and Wildlife Service (DOI).

Comment 1: The commentor indicated that a BART determination should not be contingent on whether the amount of visibility improvement is humanly perceptible or not.

Response: In the Department's analysis, there is no discussion whether the amount of visibility improvement from SNCR + LNC3+ versus LNC3+ was perceptible or not. The maximum amount of visibility improvement was only 0.106 deciviews (98<sup>th</sup> percentile) at any one Class I area and the average for all North Dakota Class I areas was 0.056 deciviews. The Department considers this amount of visibility improvement to be very small. In any event, the Department believes the federal Clean Air Act (CAA) and Regional Haze rules provide it the authority and discretion to consider whether the BART factor involving the degree of improvement in visibility to include understanding whether the degree of improvement in visibility is humanly perceptible (or not) and to what extent.

In addition, were the Department to rely on single source modeling using a clean background, as EPA has suggested States may do, the amount of visibility improvement is over predicted in that modeling. An observer can detect a change in visibility much more easily in clean air than in air which is realistically affected by emissions from a number of existing sources. Therefore, the Department determined that EPA's single source modeling will overstate a predicted change in visibility resulting from use of an emission control technology because the model assumes there are no background sources of emissions, which in reality is not the case. Single source modeling also overstates ammonia availability for the formation of the visibility-affecting species nitrate, adding to the over prediction of visibility improvement. SNCR is not warranted based on the small amount of visibility improvement.

Comment 2: The DOI believes the Department should develop a cost for the various control technologies on a dollar per deciview basis.

Response: As pointed out in previous responses to comments from the DOI, the Department believes the dollar per deciview metric is of little value for BART analyses (see ND SIP, Appendix J.1.4, Comment 12). Single source modeling does not reflect the true visibility improvement because it uses an unrealistic clean background and does not include in the modeling all sources affecting visibility in the Class I area (see Response to DOI Comment 1). Visibility improvement from single-source modeling may be less overstated if there are very few sources affecting the Class I areas and the levels of visibility impairment are minor. However, North Dakota's Class I areas sustain significant visibility impairment caused by many sources, including sources located outside the United States. In areas where there are few sources affecting the Class I area, the single source modeling may produce a less overstated prediction of

visibility improvement and thus a more accurate cost on a \$/deciview basis than it will in North Dakota. In addition, cost estimation methods have only a  $\pm 30\%$  accuracy which can lead to as much as a 60% variation from one cost estimate to another (also cost on a dollar per deciview basis). Cost estimates accuracy may also vary from state-to-state. There is no established range of acceptable cost based on a dollar per deciview basis and the modeling performed can also vary in accuracy from state-to-state. Therefore, comparing the \$/deciview results for North Dakota to the \$/deciview results for another state will not result in a true comparison of cost; i.e. it would not be ‘an apples-to-apples’ comparison. The U.S. EPA in their Response to Comments on their proposed FIP also dismissed the use of this metric (see 77 FR 20913).

The Department did not use the dollar-per-deciview metric on any of its original BART determinations. The Department continues to believe that an evaluation of the magnitude of the difference in visibility improvement between two control options provides the most useful information. To maintain consistency with previous BART determinations and for the reasons stated above, the Department will not use the dollar-per-deciview metric.

Comments 3: The commentor believes that the Department should include the cumulative impact on all affected Class I areas, rather than just the nearest Class I area.

Response: The Department continues to believe the cumulative visibility effects analysis promoted by DOI is not scientifically sound and not in accordance with agency rule or law (see ND SIP, Appendix J.1.4, Response to Comment 6). Adding the maximum improvement value (98<sup>th</sup> 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 nor is it physically realistic from the standpoint of an observer located at one Class I area. In addition, DOI has not defined which Class I areas should be added together to achieve the cumulative impact. The lack of a scientific basis for adding results of one Class I area to that of another and the lack of a methodology for preparing these analyses makes the analyses inconsistent and of low technical credibility and value. Importantly, the BART Guidelines only require an evaluation of the change at each receptor at the **nearest** [emphasis added] Class I area (40 CFR 51, Appendix Y, Section IV.D.5, Step 5). It does not require adding these changes together for multiple Class I areas. Further, the single source modeling methodology contained in the BART Guidelines already overstates visibility improvement for a given technology (see Response to DOI Comment 1). Creating a “cumulative effects” analysis based on the flawed BART analysis only compounds the over prediction inaccuracy and misleads the reader of the SIP.

Comment 4: The Department should add a cost estimate using the original baseline emission rate of 0.22 lb/10<sup>6</sup> Btu and include the cost of Drying Fining<sup>TM</sup>.

Response: The Department believes use of a current baseline emission rate of 0.20 lb/10<sup>6</sup> Btu is appropriate as outlined in pages 3-5 of the Supplemental Evaluation. As indicated on page 5 of GRE’s Supplemental Analysis, the cost of Dry Fining<sup>TM</sup> is \$270 million dollars (\$135 million per unit). Adding this amount on top of the capital cost of SNCR plus LNC3+ (\$17.9 million dollars) would definitely show that the technology is not cost effective. However, the Dry Fining<sup>TM</sup> technology primarily improves boiler efficiency by removing moisture from the coal. The reduction of NO<sub>x</sub> emissions is a secondary benefit of the process. Since the process was not

specifically designed for NO<sub>x</sub> removal, separating out a cost for NO<sub>x</sub> removal is not possible. Therefore, the Department will not attempt the suggested analysis.

Comment 5: The commentor suggested that the BART emission limit of 0.17 lb/10<sup>6</sup> Btu may be too high since the BART analysis used an emission rate for LNC3+ of 0.153 lb/10<sup>6</sup> Btu.

Response: The 0.153 lb/10<sup>6</sup> Btu emission rate from the use of LNC3+ is on an annual average basis. EPA requires the BART emission limit be on a 30-day rolling average basis. The Department has indicated in previous BART analyses that a 30-day rolling average is expected to be 5-15% higher than an annual average (see ND SIP, Appendix B.1 page 16). A 10% increase of the annual average emission rate would yield a 30-day rolling average of 0.17 lb/10<sup>6</sup> Btu (rounded to two decimal places) for Coal Creek Station Units 1 and 2. The limit, which just happens to be the same as the presumptive BART limit, is appropriate.

Comment 6: The commentor believes that since other North Dakota BART determinations were based on SNCR, SNCR should be required for the Coal Creek Station.

Response: By definition, BART is an emission limit, not a technology (see 40 CFR 51.301). The NO<sub>x</sub> emission limit the Department has proposed for the Coal Creek Station is lower than the BART emission unit for any other BART-eligible source in North Dakota. SNCR at Coal Creek Station provides very little visibility improvement. The amount of ash sales that will be lost cannot be determined precisely. If 30% or more of the ash sales are lost, SNCR plus LNC3+ will not be cost effective. SNCR has adverse environmental effects due to the likely ammonia contamination of the fly ash, such as emissions of ammonia to the atmosphere and loss of useful land. SNCR is not warranted because LNC3+ can achieve the emission rate of 0.17 lb/10<sup>6</sup> Btu (30-day rolling average).

Comment 7: The commentor believes the Department should reevaluate the economic feasibility of low-dust or tail-end SCR. The commentor suggested that the price of natural gas had declined which would require a reevaluation of the economics of SCR (natural gas is used for reheating the flue for tail-end and low-dust SCR).

Response: Both the Department and EPA have previously determined that SCR (high-dust, low-dust and tail-end SCR) are not required as BART (ND SIP Appendix B2, and 76 FR 58622-58623). The commentor has provided no new information on the technical feasibility or economics of SCR to warrant a reevaluation. Even if the cost of natural gas was reduced by 50%, the cost of low-dust SCR would still be \$11,385 per ton which is clearly excessive. SCR is not cost effective for the Coal Creek Station.

Commentor: National Parks Conservation Association (NPCA)

Comment 1: North Dakota's Supplemental Evaluation does not obviate EPA's lawful Federal Implementation Plan.

A. EPA properly exercised its authority to issue a Federal Implementation Plan.

Response: As set forth in its Public Notice, the Department sought public comment on the new information provided to the Department by the operator of Coal Creek Station, Great River Energy (GRE). Specifically, the Department sought comment on the “new information regarding the cost of selective non-catalytic reduction SNCR, the amount of visibility improvement expected to occur from the use of SNCR and other information provided by Great River Energy.” Public Notice, September 24, 2012. In its Public Notice, the Department also stated that, “The preliminary supplemental evaluation confirms the Department’s original NO<sub>x</sub> BART determination for the Coal Creek Station.” *Id.* Accordingly, public comment was requested only on the Coal Creek Station BART determination not on whether the Department’s validation of its original BART determination for the Coal Creek affects EPA’s Regional Haze FIP for North Dakota. Further, the question of whether EPA’s disapproval of North Dakota’s original BART determination was arbitrary and capricious is currently the subject of litigation pending in the Eighth Circuit Court of Appeals. *See North Dakota v. U.S. EPA*, No. 12-1844 (8th Cir. April 9, 2012), consolidated with No. 12-1961, and 12-2331. NPCA is a party to this litigation.

While NPCA’s comment is not responsive to the Supplemental Evaluation of NO<sub>x</sub> BART Determination for Coal Creek Station Units 1 and 2, the Department nonetheless believes that NPCA’s comments are without merit. As explained in the Supplemental Evaluation, (*see* p. 1), the Department’s subsequent reevaluation of the BART determination for Coal Creek Station was necessitated because EPA discovered that GRE had used a value for ash sales based on the total sales price instead of the amount GRE would receive from the sales (*see* 76 FR 58603/1). GRE provided the Department with revised fly ash sales information, which the Department reviewed. The Department also requested that GRE submit a revised BART cost estimate to the NDDH. After several additional requests for information from GRE, NDDH completed its supplemental BART review for the CCS Units in July 2012.

Under the CAA, States have the authority and discretion to make BART determinations for sources within their jurisdiction. Until the GRE cost information was received neither the State, nor EPA, could determine whether the original BART determination reached by the Department needed to be revised. Accordingly, the Department’s authority to conduct its BART determination for the Coal Creek Station cannot be supplanted by EPA’s FIP.

B. North Dakota’s Untimely Supplemental Evaluation does not supplant the FIP.

Response: As explained in the Department’s Response to NPCA’s Comment 1.A. above, the Department’s supplemental evaluation of the Coal Creek Station was within the Department’s authority under the CAA to conduct, and under the circumstances necessary. In its FIP, EPA notes that, “North Dakota always has the discretion to revise its SIP and submit the revision us. Should such a revision meet CAA requirements, we would replace our FIP with North Dakota’s SIP revision. We encourage the State to revise its SIP.” 77 FR 20897/2. NPCA dismisses the Department’s supplemental evaluation arguing that because it reaffirms its original BART determination for Coal

Creek Station, it should not be considered by EPA. *See* NPCA Comments at p.3. EPA's FIP was clear that it would accept any additional SIP submission from the Department. The supplemental evaluation for Coal Creek Station, based upon new cost data received by the Department from GRE, provides EPA with the information necessary to affirm North Dakota's original BART determination for the Coal Creek Station.

Comment 2: North Dakota's Supplemental Analysis is internally inconsistent, technically flawed and legally deficient.

A. North Dakota's failure to consider SCR is inappropriate.

Response: The Department considered SCR (low-dust SCR) in its original determination. The cost of low-dust SCR was \$13,101 per ton of NO<sub>x</sub> removed, which is clearly excessive (see ND SIP Appendix B.2, page 16). EPA also evaluated SCR for the Coal Creek Station and determined that the cost and amount of visibility improvement did not warrant the application of SCR (76 FR 58623).

The commentor suggests that a letter from Johnson Matthey indicating that they will supply a guarantee for low-dust or tail-end SCR warrants a new review of these control options. As stated earlier, low-dust SCR was rejected by both the Department and EPA based on cost and the small improvement in visibility. Tail-end SCR will have a higher annualized cost because of increased reheating of the flue gas. A proposed guarantee for low-dust or tail-end SCR does not change the cost or visibility analysis conducted by the Department and EPA. The commentor has provided no evidence to indicate that either the Department's or EPA's cost estimate is incorrect. Therefore, no reevaluation of SCR is warranted.

B. North Dakota's evaluation of nonvisibility issues regarding SNCR is flawed.

1. The commentor contends that the baseline NO<sub>x</sub> emission rate is too low. This is based on an analysis by Dr. Ranajet Sahu who claims the heat input and emission rate used in the Department's calculation are too low.

Response: The BART Guidelines (40 CFR 51, Appendix Y) state "The baseline emissions rate should represent a realistic depiction of **anticipated** [emphasis added] annual emissions for the source." This means that the baseline is not necessarily the same as past actual emissions. Dr. Sahu suggests a rate of 0.208 lb/10<sup>6</sup> Btu instead of the 0.201 lb/10<sup>6</sup> Btu the Department used. Dr. Sahu bases his baseline emission rate on an evaluation of past annual averages. However, Dr. Sahu ignores several monthly averages that are below 0.201 lb/10<sup>6</sup> Btu including:

<u>Month</u>	<u>Emission Rate (lb/10<sup>6</sup> Btu)</u>
July 2010	0.195
October 2010	0.191
February 2011	0.175
March 2011	0.192
May 2011	0.197
June 2011	0.193
July 2011	0.187
June 2012	0.190

Each unit of the Coal Creek Station currently has an NO<sub>x</sub> emission limit of 0.40 lb/10<sup>6</sup> Btu (annual average). There is currently no requirement or incentive to reduce NO<sub>x</sub> emissions below the current allowable limit. Therefore, past annual averages may not be representative of future emission rates. The NO<sub>x</sub> data from Coal Creek clearly indicates that DryFining™ will reduce emissions to 0.201 lb/10<sup>6</sup> Btu or less. The Department believes this is a reasonable estimate of future emissions (baseline emissions).

Dr. Sahu also calculated annual average heat inputs using 24-month rolling averages. However, Dr. Sahu did not use the same baseline period for both units. The Department believes this is an incorrect evaluation of baseline. When two or more units operate at an electrical generation station, the operation of the units is dependent on each other. That is, if one unit is operating at lower load or is shutdown, the other units may have to increase load to make up for the reduced load unit. Therefore, in order to establish an accurate heat input baseline, the same time period must be used for all units. Had Dr. Sahu used the same time period for both units (e.g. April 2005 through April 2007 which Dr. Sahu used for Unit 1), the difference between the Department's average heat input for the two units and his average would have been approximately 1.5%. The difference can be attributed to the Department using a two calendar year average versus Dr. Sahu's 24-month rolling average. The Department used calendar year averages to be consistent with other BART determinations it has made. The difference in baseline heat input is inconsequential.

2. The commentor suggested that the removal efficiency for SNCR used by the Department was too low. Dr. Sahu claims that a form of SNCR technology referred to as HERT™ (High Energy Reagent Technology) can produce NO<sub>x</sub> emission rates as low as 0.10 lb/10<sup>6</sup> Btu (the Department used an emission rate of 0.122 lb/10<sup>6</sup> for SNCR plus LNC3+).

Response: Fuel Tech, Inc., the marketer of the HERT™ equipment states in NPCA Exhibit 1b the following: "The SNCR systems provided by Fuel Tech may include NO<sub>x</sub> Out® injectors along with HERT™ System Injection technology, using the same urea storage, handling and control components. Fuel Tech's

SNCR application relies heavily on the use of Computational Fluid Dynamics (CFD) models and Chemical Kinetics Modeling and their resulting visualization utilizing proprietary software.” Dr. Sahu has provided no documentation to indicate that the fluid dynamics modeling and chemical kinetics modeling have been done for either unit at the Coal Creek Station. In addition, Fuel Tech in their slide presentation (NPCA Exhibit Reinhold\_2011\_KD) indicates their “Guaranteed Proven NO<sub>x</sub> Reduction” is only 15-35% for a utility boiler. The NO<sub>x</sub> removal efficiency at Coal Creek Station could be as low as 15%. This slide presentation also indicates that the HERT™ has only been used as a demonstration project on a boiler as large as Coal Creek Station’s boilers (550+ MWe each). This demonstration project only produced a controlled NO<sub>x</sub> emission rate of 0.29 lb/10<sup>6</sup> Btu (29% reduction from baseline). The NO<sub>x</sub> emission rate for Coal Creek Station before the application of SNCR will be 0.153 lb/10<sup>6</sup> Btu. Importantly, EPA’s Air Pollution Control Technology Fact Sheet (EPA-452-F-03-031) states “SNCR tends to be less effective at lower levels of uncontrolled NO<sub>x</sub>.”

GRE, in their November 21, 2012 Response to Comments, indicates that HERT™ has been mostly used on industrial boilers that are much smaller than the Coal Creek Station boilers. The slide presentation provided by the NPCA also indicates no permanent installations above 200 MW. This slide presentation also indicates HERT is less effective on utility boilers than industrial boilers (20-70% for industrial boilers versus 10-35% for utility boilers). GRE has supplied various documentation to suggest HERT™ may not achieve an emission rate of 0.10 lb/10<sup>6</sup> Btu. *See* GRE’s Response to Comments.

Based on the information provided, the Department concludes that Dr. Sahu’s expected emission rate of 0.10 lb/Btu from the application of HERT™ is unsupported. There is insufficient evidence to indicate HERT™ will achieve an emission rate lower than the 0.122 lb/10<sup>6</sup> Btu the Department evaluated for SNCR at Coal Creek Station.

3. The commentator suggested that the cost estimate for SNCR is inflated and not supported by the underlying calculations. Part of the so-called inflated cost is attributed to the use of a low baseline (see Response to Comment B.1) and the failure to consider HERT™ (see Response to Comment B.3). Dr. Sahu’s analysis takes issue with the “SNCR Equipment Cost,” the installation factor of 1.3, the “Retrofit Factor,” “Prime Contractor Markup” and “Process Contingency.”

Response: There is no documentation supplied to indicate Dr. Sahu has ever visited the Coal Creek Station or even reviewed engineering drawings of the facility. URS conducted an on-site review of the facility for Great River Energy to evaluate the installation of SNCR. The URS cost estimate has been verified by the IPM model which EPA has used to evaluate costs at electric utilities for FIPs in Arizona and Montana. In addition, the DOI in their comments states “The capital cost estimate for SNCR installation of \$20/kilowatt used by DAQ [ND

Dept. of Health] seems reasonable when compared to National Park Service NO<sub>x</sub> BART data for several BART determinations that have been proposed nationally.” The Department stands by the cost estimate.

4. The commenter suggests that inclusion of any costs for lost ash sales and/or ash disposal is premature. Dr. Sahu suggests that HERT<sup>TM</sup> will minimize ammonia slip which can cause lost ash sales.

Response: Fuel Tech, Inc. in their slide presentation (NPCA Exhibit Reinhold\_2011\_KD) only indicates that ammonia slip will be “low.” Dr. Sahu does not define “low.” The Department has provided references that suggest that even minimal ammonia slip (<2 ppm) can cause ash to be unusable for concrete. Dr. Sahu is merely speculating by stating “... the underlying problem simply **may not** [emphasis added] exist using SNCR/HERT<sup>TM</sup>.” The commenter has provided no evidence to refute the Department’s conclusion that some ash sales will be lost. As indicated by Lafarge indicated in its comments, some ash sales will definitely be lost. The DOI in their comments also indicated that 30% lost ash sales was reasonable.

- C. North Dakota’s Rejection of SNCR is Premised on an Internally Inconsistent and Arbitrary Analysis of Incremental Visibility Improvement.

Response: The commenter refers to the Stanton Station where SNCR was required under BART. The application of LNB + OFA + SNCR at the Stanton Station was considered cost effective (\$3,052/ton for lignite with an incremental cost of \$6,932/ton). SNCR alone would not have been considered cost effective. The cost of SNCR + LNC3+ at Coal Creek Station is \$2,195 - \$4,444/ton with an incremental cost of \$4,619 - \$10,350/ton depending on how much of the ash sales are lost. If 30% of the ash sales are lost, the incremental cost would be \$7,449/ton which the Department considers excessive. If 100% of ash sales are lost, the cost effectiveness SNCR + LNC3+ is \$4,444/ton with an incremental cost of \$10,350/ton, both considered excessive by the Department. Sale of ash was not an issue at the Stanton Station. Since the exact amount of ash sales that will be lost due to ammonia slip from SNCR cannot be determined, the exact cost of SNCR cannot be determined. The Department chose to weigh the cost less in the Coal Creek determination because of this uncertainty. The Department found that the visibility improvement was insignificant from the use of SNCR and there are potential adverse environmental effects associated with SNCR at Coal Creek Station.

The BART emission limit for Coal Creek Station is actually lower for Coal Creek Station (0.17 lb/10<sup>6</sup> Btu) without SNCR than it is for the Stanton Station with SNCR (0.23 – 0.29 lb/10<sup>6</sup> Btu). The Department considered all five stationary factors when determining BART for Coal Creek Station just like it did for all other BART sources including the Stanton Station.

D. The State Underestimated Visibility Improvement

1. The State underestimated visibility improvement by failing to consider cumulative visibility improvement.

Response: See Response to Comment 3 from the DOI.

2. The State underestimated visibility improvement by considering a narrow geographic range of impacted areas and by not considering more than 98% of impacts.

Response: The BART Guidelines (40 CFR 51, Appendix Y) state “One important element of the protocol is in establishing the receptors that will be used in the model. The receptors that you use should be located **in the nearest Class I area** [emphasis added] with sufficient density to identify the likely visibility effects of the source.” Nothing in the BART Guidelines requires receptors at additional Class I areas. Even so, the Department included receptors at the four nearest Class I area (TRNP-SU, Elkhorn Ranch Unit, TRNP-NU and Lostwood Wilderness Area). Any impacts on visibility would be less at Class I areas outside of the State due to a BART control technology. In addition, neither the Department nor EPA believes the application of CALPUFF is reasonable beyond 300 km. In the Guideline on Air Quality Models (40 CFR Part 51, Appendix W) EPA states, “it was concluded from case studies that the CALPUFF dispersion model had performed in a reasonable manner, and had no apparent bias toward over or under prediction **so long as the transport distance was limited to less than 300 km.**” [emphasis added]. Regarding the Department’s specific implementation of CALPUFF, performance evaluations conducted by the Department are able to verify accuracy of the model only out to about 250 km.

The Department did not consider predicted impacts greater than the 98<sup>th</sup> percentile because the BART Guidelines specify use of the 98<sup>th</sup> percentile. The model and procedure are already very conservative (see response to the DOI Comment 1), and introduction of further conservatism by using the overall maximum prediction (i.e., 100<sup>th</sup> percentile), rather than the 98<sup>th</sup> prediction, is not reasonable. Also, as noted on page 14 of the Department’s analysis, the Department also considered the number of days with visibility impairment above 0.5 deciviews. The number of days per year where the impact is less than 0.5 deciviews will only increase by two days per unit through the application of SNCR. The BART Guidelines state “You have flexibility to assess improvements due to BART by **one or more methods** [emphasis added]”. The Department’s approach is consistent with the BART Guidelines.

E. The North Dakota’s Analysis Unlawfully Fails to Consider Visibility Improvement in Relation to the Statutory Goal of Eliminating Visibility Impairment.

Response: Section 169A(g)(2) of the Clean Air Act specifies the five stationary factors that must be considered in making a BART determination.

EPA's Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program (June 1, 2007) states, "Note that for some sources determined to be subject to BART, the State will already have completed a BART analysis. Since the BART analysis is based, in part, on an assessment of many of the same factors that must be addressed in establishing the RPG, it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period. Hence, you may conclude that no additional emissions controls are necessary for these sources in the first planning period." The Department has considered the National Visibility Goal in establishing its Reasonable Progress Goals.

The commentator states that the 0.106 deciview improvement (98<sup>th</sup> percentile) or 0.020 deciviews (90<sup>th</sup> percentile) represents nearly the entire improvement needed in a single year to be on a path toward attaining natural visibility in 2064. This statement is confusing to the Department. The Department interprets this statement to mean that applying SNCR at Coal Creek will achieve the Uniform Rate of Progress. If this interpretation is accurate, the statement is utterly incorrect. In order to achieve the Uniform Rate of Progress, an additional 1.4 deciviews improvement would be required at TRNP and 2.0 deciviews at Lostwood Wilderness Area. An improvement of 0.020 deciviews (90<sup>th</sup> percentile is more closely related to the average of the 20% worst-case days which is used to calculate the Uniform Rate of Progress) will make very little difference in the rate of achieving the National Visibility Goal. (Note: The 0.020 deciview improvement is based on single source modeling. Cumulative modeling is conducted to determine the rate of visibility improvement for comparison with the Uniform Rate of Progress. The cumulative modeling would produce even smaller improvement.)

If the commentator is suggesting that SNCR at Coal Creek will produce 0.106 deciviews improvement each year, the statement is also incorrect. Improvement from SNCR does not summate year after year. The commentator does not appear to understand the Regional Haze planning process. Reasonable Progress is determined for a planning period (i.e., 10 years) and not on a yearly basis.

The comment also suggested the Department should explain its rationale for determining the visibility improvement from SNCR is "small." The amount of visibility improvement from SNCR is a maximum of 0.106 deciviews (98<sup>th</sup> percentile). The ND Air Pollution Control Rules (NDAC 33-15-25-01.2) defines "Contributes to visibility impairment" as a change in visibility impairment in a Class I federal area of 0.50 deciviews or more above the natural visibility baseline (98<sup>th</sup> percentile). The improvement from SNCR is 21% of the level that contributes to visibility impairment. The Department considers 0.106 deciviews a small contribution to total visibility degradation or a small improvement in visibility.