NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF AIR QUALITY

PREVENTION OF SIGNIFICANT DETERIORATION PRECONSTRUCTION REVIEW AND FINAL DETERMINATION

FOR

UNIT 6
AT
DUKE ENERGY CAROLINAS LLC
CLIFFSIDE STEAM STATION
CLIFFSIDE, RUTHERFORD COUNTY
NORTH CAROLINA

JANUARY 28, 2008

THIS REVIEW WAS PERFORMED BY THE
AIR PERMITS SECTION
IN ACCORDANCE WITH 15A NCAC 2D .0530 - NCDAQ
REGULATION FOR
PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY

CHRONOLOGY

December 16, 2005	Duke Energy Carolinas LLC ("Duke") submitted to the North Carolina Division of Air Quality (NCDAQ) a Prevention of Significant Deterioration (PSD) permit application (8100028.05B) proposing to expand the electric generation capacity of the Cliffside Steam Station located in Rutherford and Cleveland Counties.
December 21, 2005	The application was deemed administratively complete for review purposes.
August 14, 2007	The NCDAQ, Permitting Section made a Preliminary Determination that the proposed Duke Energy Cliffside 6 modification complied with all PSD requirements. Therefore, the Permitting Section proposed approval of the air permit with specific conditions to ensure compliance with all BACT limits.
August 14, 2007	Public Notice of the Preliminary Determination and draft permit was published in The Daily Courier and The Charlotte Observer, giving the public a 30-day notice of a public hearing on the proposed project and notice of opportunity to submit comments on the Preliminary Determination and draft permit.
September 18, 2007	A public hearing on the proposed Cliffside 6 modification was held at 6:00 PM at Chase High School in Forest City.
October 31, 2007	The Public Notice period for the Preliminary Determination and draft permit ended. Comments were received as discussed in Section 2. Note that the Director extended the comment period through November 15, 2007.
January 28, 2008	The NCDAQ, Permitting Section made a Final Determination that all applicable North Carolina Environmental Management Commission air pollution regulations, including the PSD requirements have been satisfied and issued Air Permit No. 04044T28 to Duke Energy Carolinas LLC for the construction and operation of the Cliffside 6 modifications.

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Appendices

1.0 INTRODUCTION

Duke Energy Carolinas LLC ("Duke") submitted to the North Carolina Division of Air Quality (NCDAQ) a Prevention of Significant Deterioration (PSD) permit application (8100028.05B) proposing to expand the electric generation capacity of the Cliffside Steam Station located in Rutherford and Cleveland Counties. The Cliffside facility operates under the current air permit 04044T27, which includes five coal-fired boilers, Units 1-5. This expansion project includes installation of one, new, supercritical pulverized coal-fired 800 MW boiler, and the retirement of existing Units 1-4. The new boiler (Unit 6) would be fired primarily with bituminous coal, or a blend of bituminous and sub-bituminous coals. Other ancillary emission sources for the project include: an auxiliary boiler, cooling tower, emergency generator, firewater pump, and various coal handling, ash handling and lime handling emission sources. The older less efficient and uncontrolled Units 1-4 (with a combined capacity of about 200 MW) which began operation around 1940 will be retired when the new Unit 6 begins operation, bringing the total capacity of the station (Units 5 and 6) to 1360 MW.

The proposed project is a major stationary source, classified under the category of "fossil fuel-fired steam electric plants of more than 250 million Btu per hour heat input." Therefore, the facility is subject to review and processing under the North Carolina Administrative Code, Title 15A, Subchapter 2D, Section .0530 "Prevention of Significant Deterioration" (PSD). The plant must also comply with all other applicable NCDAQ state air pollution regulations.

The application was deemed administratively complete for review purposes December 21, 2005. The Preliminary Determination was issued on August 14, 2007, and the Public Notice was published August 14, 2007 in The Daily Courier and The Charlotte Observer, giving the public a 30-day notice of a public hearing on the proposed project and notice of opportunity to submit comments on the Preliminary Determination and draft permit. All information relating to the proposed project, including the preliminary determination and draft permit, was made available for public inspection at the Haynes Public Library in Henrietta, NCDAQ's Asheville Regional Office, and NCDAQ's Central Office in Raleigh, as well as posted on NCDAQ's website at http://NCDAQ.state.nc.us/permits/psd/cliffside.shtml. A public hearing on the proposed Cliffside 6 modification was held at 6:00 PM at Chase High School in Forest City. The Public Notice period for the Preliminary Determination and draft permit ended on October 31, 2007. The Director extended the comment period through November 15, 2007.

The unit is projected to begin operation as early as 2011.

2.0 COMMENTS ON PRELIMINARY DETERMINATION AND DRAFT PERMIT

This section addresses the following comments received on the project. All comments are available for public inspection at NCDAQ's Central Office in Raleigh and NCDAQ's Asheville Regional Office.

1 EPA Region 4 letter to Dr. Donald van der Vaart from Greg Worley dated October 31, 2007
2 National Park Service letter to Ed Martin from John Bunyak dated October 31, 2007
3 Southern Environmental Law Center (SELC) letters to Donald van der Vaart from Marily Nixon and Gudrun Thompson dated October 31, 2007 and November 15, 2007
4 Duke Energy Carolinas letter to Donald van der Vaart from James L. Turner dated October 31, 2007
5 Hearing Officer's Report and Recommendations from the public hearing held September 18, 2007, dated December 11, 2007
6 Duke Energy Carolinas letter to William G. Ross Jr. dated December 31, 2007; and Duke Energy Carolinas letter to William G. Ross Jr. dated January 28, 2008

The Hearing Officer's Report and Recommendations covers all public comments received.

2.1 EPA Region 4 Comment letter to Dr. Donald van der Vaart from Greg Worley dated October 31, 2007

The following comments were received from the Environmental Protection Agency (EPA) Region 4.

EPA-1 Netting Analysis: EPA requested that NC inform Duke that the outcome of EPA's pending NSR enforcement action concerning Cliffside Units 1-5 may affect PSD compliance at Unit 6 with respect to NOx and SO2 emissions.

NCDAQ Response – As requested by EPA, NCDAQ has notified Duke that the outcome of the pending enforcement action could affect PSD compliance at Unit 6 with respect to NO_x and SO_2 emissions. If the case results in a judgment that Duke's previous modifications at Cliffside were made in violation of PSD requirements, NCDAQ will determine what changes to the permit are necessary. The final permit will include a specific condition allowing the NCDAQ to reopen the permit as necessary to address the ultimate resolution of the USEPA's litigation. One result of a judgment adverse to Duke could be a requirement that BACT limits for NO_x and SO_2 be set for Unit 6. Although the project did not trigger PSD for NO_x and SO_2 at this time, the final permit includes emission limits on both NO_x and SO_2 that are as stringent as any BACT

limit for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coals.

EPA-2 Absence of Total Mass Emissions Limits: EPA commented that the permit should include a total mass emission limit or limit on maximum heat input for both Unit 6 and the auxiliary boiler.

NCDAQ Response - The final permit includes an enforceable limit for heat input rate for both Unit 6 and the auxiliary boiler. The mass emission rate correlates with the rate that was used in the air quality analysis.

EPA - 3 Adjustable PM Emissions Limits for Unit 6: EPA questioned the inclusion of language allowing upward adjustment of the PM10 limit from 0.012 lb/mm Btu to 0.015 lb/mmBtu by administrative change.

NCDAQ Response - NCDAQ has deleted from the final permit the draft permit language that would have allowed adjustment of the PM10 limit by administrative change. The permit sets the BACT limit for PM10 at 0.012 lb/mm Btu consistent with EPA's recommendation.

EPA-4 Compliance Averaging Times Associated with Emissions Limits: EPA commented that the permit should include compliance averaging times associated with each BACT emission limit.

NCDAQ Response - Averaging times have been included in the permit as follows:

SOURCE	POLLUTANT	COMPLIANCE TIME
Unit 6 Boiler	PM_{10}	Compliance with the PM_{10} emission limits shall be based on a calendar day averaging time except that compliance will be determined over a shorter time period (minimum 6 hours) if the source elects to run the reference test method for less than 24 hours.
	carbon monoxide	Compliance with the carbon monoxide emission limit shall be based on the reference test method (minimum 6 hours).
	VOCs	Compliance with the VOC emission limit shall be based on the reference test method (minimum 6 hours).
	sulfuric acid	Compliance with the sulfuric acid emission limit shall be based on the reference test method (minimum 6 hours).
	lead	Compliance with the lead emission limit shall be based on the reference test method (minimum 6 hours).
Auxiliary Boiler	carbon monoxide	Compliance with the carbon monoxide emission limit shall be based on the reference test method (minimum 6 hours).

EPA – 5 Allowable Coals for Unit 6 and Effect on BACT Determination: EPA requested that NCDAQ re-evaluate the BACT determinations to assess the option of restricting Unit 6 to only sub-bituminous coal or only bituminous coal.

NCDAQ Response - The project, as proposed by the applicant, includes the use of both bituminous and sub-bituminous coals**.** In reviewing the permit application, NCDAQ looked at BACT limits for projects using only bituminous coal and projects using only sub-bituminous coal. The NCDAQ has not found a significant difference in PM-10 or sulfuric acid BACT limits in other permits between sub-bituminous and bituminous coal for projects listed in the preliminary determination. In addition, projects listed by SELC and the FLM demonstrate PM-10 limits burning sub-bituminous coal at Toquop, Desert Rock and AES (CO) to be greater than the Cliffside total PM-10 limit of 0.018 lb/mmBtu.

EPA-6 BACT Emission Limits for Auxiliary Boiler: EPA recommended lower PM10 BACT emission limits for the auxiliary boiler.

NCDAQ Response - The permitting authority is required to determine the emissions level that can be consistently achieved by a particular technology. Emissions data based on a single stack test may reflect the highest possible instantaneous control efficiency, but not a level that allows continuous compliance. In setting the PM10 BACT emissions level for the auxiliary boiler, NCDAQ has set the limit at the most stringent level consistent with the ability to achieve compliance on a consistent basis. The proposed BACT limit of 0.014 lb/mmBtu for the auxiliary boiler is consistent with eight final BACT determinations for distillate fuel-fired auxiliary boilers having heat input rates between 100 and 250 mmBtu/hr that were listed in the RBLC database (time period 1/1/02 through 11/28/07). The only lower emissions rate for a comparable facility in the RBLC database was an emissions limit of 0.007 lb/mmBtu for an auxiliary boiler in Arkansas. However, it was determined that this limit was erroneously entered into the database. The actual limit is 0.023 lb/mmBtu – significantly above the proposed Cliffside limit.

EPA -7 Particulate Matter BACT Limits for Material Handling Units: EPA recommended that NCDAQ select a PM10 BACT limit at the low end of the range reported in the BACT Clearinghouse for Material Handling Units.

NCDAQ Response - The permitting authority is required to determine the emissions level that can be consistently achieved by a particular technology. In setting the PM10 BACT emissions level for material handling units, NCDAQ has set the limit at the most stringent level that can be achieved on a consistent basis. The limit of 0.01 gr/dscf is consistent with the NCDAQ's control determination for material handling equipment in a recent Duke Cliffside permit. The RBLC includes one facility with a limit of 0.005 gr/dscf.

However, that facility, located in Montana burns lignite coal and is rated at 175 MW and therefore is not substantially similar to the proposed Cliffside project.

EPA-8 Startup and Shutdown Emissions: EPA commented that it was not clear from the preliminary PSD determination and draft permit whether NCDAQ was establishing separate emissions limits for start-up and shut-down.

NCDAQ Response - The BACT limits in the permit are applicable at all times. The NCDAQ regulations contain specific provisions for startup and shutdown under 15A NCAC 2D .0535. These regulations are SIP-approved and address excess emissions that occur during these events.

EPA-9 Particulate Matter Continuous Emissions Monitoring System for Unit 6: EPA recommended that a CEMS for particulate matter be required in the permit.

NCDAQ Response -The permit contains an option for operation of a PM Continuous Emissions Monitoring System (CEMS) for Unit 6. NCDAQ believes this should remain an option and not a BACT requirement. The permit as proposed already requires compliance testing. Based on that testing the NCDAQ has the authority to reopen the permit and include additional monitoring or testing requirements if it is determined they are necessary. Reliability problems with PM CEMS have been reported in other states. In December of 2007, South Carolina DEHC published a preliminary determination for a proposed coal-fired power plant that does not propose to require PM CEMS. According to DEHC, a previously installed PM CEMS on the Cross plant in South Carolina had serious reliability problems. It is clear that based on DEHC's experience, PM CEMS technology is not sufficiently mature to rely on for compliance purposes and therefore the NCDAQ will not require PM CEMS.

EPA - 10 Cooling Tower Emissions: EPA recommended that a drift elimination rate design requirement and additional recording/reporting requirements be added to the permit.

NCDAQ Response – In response to EPA's recommendation for a drift elimination rate design requirement, the PM_{10} emission limits in the permit are based on the liquid drift rate of 0.0005 percent. Because there are no control operational parameters to adjust, no additional recording requirements were considered necessary. Like EPA comment EPA-9 above, the monitoring method for determining compliance with the BACT limit can be assessed as needed during the Title V permit process. NCDAQ is not aware of any permits requiring operational parameter monitoring for similarly designed cooling towers.

EPA - 11 PM as a Regulated Pollutant: EPA's comment clarified the status of PM as a regulated pollutant, but acknowledged that NCDAQ's approach to limiting PM10 emissions is adequate to address PM.

NCDAQ Response – EPA's comment addresses the language used in the preliminary determination and does not question the adequacy of NCDAQ's review and determination with respect to PM. The EPA comment acknowledges that "NCDAQ's approach to assessing and limiting PM10 emissions for this project is adequate for PM as well."

EPA - 12 Fine Particles: EPA commented on the legal effect of EPA guidance with respect to PM2.5 and potential issuance of final NSR implementation rules for PM2.5,

NCDAQ Response - Although $PM_{2.5}$ is a regulated NSR pollutant and there is a National Ambient Air Quality Standard (NAAQS) for $PM_{2.5}$ that became effective on September 16, 1997, EPA has advised states to use PM_{10} as a surrogate for $PM_{2.5}$ until EPA promulgates the $PM_{2.5}$ implementation rule for NSR. (See Memorandum from John S. Seitz, Director Office of Air Quality Planning and Standards, to Regional Air Directors, *Interim Implementation of New Source Review for PM2.5* (Oct. 23, 1997)). This guidance was re-affirmed in the "Page" memo (http://www.epa.gov/nsr/documents/nsrmemo.pdf). On March 29, 2007, EPA issued a rule, known as the Clean Air Fine Particle Implementation Rule, defining requirements for State plans to clean the air in areas of nonattainment for $PM_{2.5}$ fine particle pollution. However, this rule did not include the NSR requirements for $PM_{2.5.}$ These requirements are expected to be addressed in separate rulemaking. Therefore, at this time compliance for PM_{10} under the NSR regulations satisfies compliance for $PM_{2.5}$. NCDAQ modeled PM-2.5 emissions from Cliffside 6 as part of NCDAQ's PM-2.5 attainment modeling SIP demonstration; that modeling showed compliance with the NAAQS.

EPA - 13 Ambient Impact Assessment: EPA commented on the adequacy of modeling to demonstrate that the emissions decrease used to "net out" has the same qualitative significance for public health as the emissions increase associated with the new unit.

a. Netting Modeling Analyses

NCDAQ Response - NCDAQ requested Duke to perform a "before and after" air quality impact for SO_2. The first phase ("before") was based on the 2006 PSD analysis, which included units 1-4 and unit 5 "scrubbed." Duke used the AERMOD model to assess the impacts. The second phase ("after") was based on the configuration of the plant if a permit were issued. The second phase includes units 5 and 6 only and also was analyzed using the AERMOD modeling system. Both analyses used the Charlotte surface and Greensboro upper-air Meteorological data.

NCDAQ also reassessed the Duke modeling files, which were based on the NCDAQ reviewed and approved emissions, for all five modeled years and for all 18,860 receptors. The Duke modeling effort was accomplished in accordance with the New Source Review Workshop Manual and Federal Register 40 CFR Part 51, Appendix W, for Air Dispersion Modeling. PSD modeled values are assessed against federally recognized Primary and Secondary National Ambient Air Quality Standards (NAAQS). NO_x values are based on the highest annual impact (NO_x).

NCDAQ's reassessment indicated the maximum annual modeled NO_x impacts decreased at all 18,860 receptors from the "before" scenario and were below the NO_x primary standard. Duke's modeling, extensively reviewed by NCDAQ, confirmed that the emission reductions achieved are qualitatively equivalent in their effects on public health and welfare to the effects attributable to the proposed increase. NCDAQ concludes that an emissions decrease will have approximately the same qualitative significance for public health and welfare as that attributable to the increase. EPA's Primary and Secondary National Ambient Air Quality Standards were determined to first protect the health and secondary welfare of humans. These values are based on the highest annual impact for NO_x or High Second High (H2H) for SO_2 long and short-term respective averaging periods. The Duke analysis showed that each averaging period values decreased from the before values.

b. PSD Class I Area Analysis

NCDAQ Response - The project did not trigger the PSD requirements for NO_x and SO_2. The final permit nevertheless includes emission limits on both NO_x and SO_2 that are as stringent as any BACT limit for similarly designed and sized coal-fired boilers firing a blend of bituminous and sub-bituminous coal. NCDAQ expects that these limits, combined with retirement of Cliffside Units 1-4 and the installation and operation of a scrubber on Unit 5, will result in a net reduction in SO_2 emissions from the Cliffside facility of approximately 26,000 tons per year. Similarly, NO_x emissions are expected to be reduced by approximately 3,500 tons per year despite doubling the electric generation capacity at Cliffside. [Note: These emission reduction estimates are based on a comparison between baseline actual emissions and expected actual emissions. Expected actual emissions are typically lower than permitted potential emissions because potential emissions are calculated assuming the electric generating unit operates at full nameplate capacity for the entire year. In contrast, an electric generating unit typically operates at no more than 80% of its capacity on a continuous basis.] Finally, PM-10 emissions were modeled and it was determined that there would not be an adverse impact on any Class I area as a result of the PM-10 emissions.

c. Project Emissions

NCDAQ Response - The maximum hourly emission rates were used for all averaging times except annual. The annual rates were scaled down (where appropriate) from the maximum hourly rates in proportion to the annual operating hours for each source.

d. Inventory of Other Emission Sources

NCDAQ Response - NCDAQ used an extensive database to assess offsite sources. NCDAQ and South Carolina DEHC provided Duke with an inventory that was sufficiently large to encompass all critical offsite sources. Q (Emissions) = 20 D (Distance) was used to "screen" from the analysis emission sources with an insignificant impact to the primary source impact area. NCDAQ used the applicable minor source date for PM_{10} (4/30/79).

2.2 National Park Service (FLM) Comment letter to Ed Martin from John Bunyak dated October 31, 2007

The following comments were received from the National Park Service (Federal Land Manager).

FLM–1 Netting Concern: The pending EPA enforcement action may affect the availability of NOx and SO2 reduction credits that NCDAQ has allowed Cliffside Unit 6 to use to "net out" of PSD review for those pollutants.

NCDAQ Response - See response to comment EPA-1.

FLM-2 NCDENR should conduct a more rigorous evaluation of the option to use IGCC Clean Coal Technology at Cliffside.

NCDAQ Response - As stated in the preliminary determination, the NCDAQ concluded that IGCC is not a BACT candidate for this project. NCDAQ has stated in the preliminary determination that IGCC technology holds promise; but NCDAQ finds that there is significant uncertainty with regard to the availability and applicability of this technology for an 800 MW base-load unit. Moreover, NCDAQ considers IGCC to be a source, not a control technology to be applied on a SCPC source; therefore, the use of IGCC would require its own BACT analysis to determine the control technology appropriate for the IGCC source.

Public hearings were held by the NC Utilities Commission (NCUC) on August 30, 2006, August 31, 2006, September 12 through 14, 2006, and January 17 through 19, 2007 regarding Duke's application seeking the issuance of a Certificate of Construction for two 800 MW units. The alternatives proposed by

interveners were that Duke build an IGCC facility instead of a SCPC facility. The NCUC issued an order on March 21, 2007, granting Duke the Certificate of Public Convenience and Necessity for construction of one SCPC facility 800 MW unit. The NCUC found that Duke cannot rely upon the newly emerging IGCC technology "to supply its need for additional baseload generating capacity beginning in 2011." NCDAQ agrees with NCUC's findings that alternative means of generating electrical power at Cliffside 6 have been considered.

As noted in the preliminary determination, there are only two IGCC plants in operation at this time in the United States and the extent to which these plants are reliable to service base load is unknown. Both plants are significantly smaller (250 MW and 262 MW) than the proposed Cliffside plant and both are Clean Coal Demonstration projects with significant government funding. No data suggests that IGCC is currently commercially available to meet utility baseload needs.

FLM-3 NCDENR should ensure that Cliffside Unit #6 complies with the intent of Senate Bill 1587.

The NCDAQ agrees with this comment. For SO_2, the requirements contained in SB 1587 applicable to Unit 6 are included in the permit at Specific Condition 2.1 J.3.

FLM-4 The lack of short-term limits on emissions makes it impossible to correctly determine if NAAQS and Increments are being protected. If Cliffside has no short-term limits on SO_2, it will also be impossible to determine its impacts upon visibility. NCDENR should add short-term limits on SO_2.

NCDAQ Response - It is unclear what the commenter is referring to when they state that the permit should have a short-term limit on SO_2. The permit does contain a short-term limit (30-day average) for SO_2 of 1.4 lb/MWh pursuant to the New Source Performance Standard (NSPS) subpart Da.

FLM-5 NCDENR should use the natural background conditions recommended by FLAG in the visibility analysis.

NCDAQ Response - NCDAQ consults various technical documents when evaluating a facility's impact on the ambient air both in Class I and Class II areas. Because the PSD program is designed to prevent significant deterioration from current (i.e. baseline) conditions, NCDAQ used current monitored IMPROVE data to establish the 'background" value in assessing before and after Class I air shed change in visibility (Deciview). The use of the IMPROVE data ensures that the source's impact on current air quality is properly evaluated and is consistent with FLM-16.

FLM-6 We have shown that boilers burning "cleaner" coal can achieve higher SO_2 removal. NCDENR should evaluate the possibility of achieving lower SO_2 emission rates for Unit #6.

NCDAQ Response - The new unit proposes to use a mix of bituminous and sub-bituminous coal, but will likely burn primarily eastern bituminous coal. The permit includes an emission limit for SO_2 that is as stringent as any BACT limit for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coal. The permit also requires retirement of four older boilers at the Cliffside facility (Units 1-4) and installation and operation of a scrubber at Unit 5. As a result of all of the changes required by the permit, the NCDAQ expects a reduction in SO_2 emissions of approximately 26,000 tons per year.

FLM-7 We agree with NCDENR that SCR represents BACT for NOx. However, we believe that the appropriate limit for a PC boiler burning coal should be 0.05 lb/mmBtu for a 24-hour average, not the proposed 0.10 lb/mmBtu (30-day rolling average).

NCDAQ Response - The project, as submitted by the applicant, did not trigger PSD for NOx emissions and therefore a case-by-case BACT analysis was not required. However, the permit contains a NOx limit of 0.07 lb /mmBtu (30-day rolling average) that is as stringent as any BACT limit for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coals. The NCDAQ is not aware of any similarly designed and sized unit firing a blend of bituminous and sub-bituminous coals that has demonstrated long-term compliance with a 0.05 lb/mmBtu limit on a 24-hour average.

FLM-8 We have shown that other coal-fired boilers are capable of lower filterable PM_{10} emissions. NCDENR should either lower its PM_{10} emissions or justify its need for an emission rate higher than the examples cited. NCDENR should provide an opportunity for the FLMs and the public to review any increase in the proposed emission limits.

NCDAQ Response - The issue raised by the FLM is the actual permit limit that the BACT technology can achieve. The permitting authority is required to determine the emissions level that can be consistently achieved by a particular technology. The PM_{10} limit is as stringent as any BACT limit for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coals. Unlike some of the facilities identified by commenters, the final permit includes limits for both PM_{10} and total PM. The emission limit for total PM is lower than limits on any other permitted facility that NCDAQ has reviewed. In addition, the final permit has been revised to remove language in

the draft permit that would have allowed the limit to be raised by administrative change. See also response to SELC-14.

FLM-9. NCDENR should include a requirement for Continuous Emissions Monitoring of PM_{10} as was done by West Virginia in the Longview permit.

NCDAQ Response - See response to EPA-9.

FLM-10 The impacts to the SO_2 Class I short-term three-hour and 24-hour increments are greater than the EPA Class I Significant Impact Levels.

NCDAQ Response – Since the permit provides for the retirement of Cliffside Units 1-4 and installation and operation of a scrubber on Cliffside Unit 5, the project, as proposed by the applicant, did not trigger the PSD requirements for SO_2. NCDAQ has, however, included an emissions limit for SO_2 in the final permit that is as stringent as any BACT limit for a similarly designed and sized coal-fired boiler firing bituminous and sub-bituminous coals. The overall impact of the permit will be a decrease in SO_2 emissions of approximately 26,000 tons per year.

FLM-11 The FLM's own visibility analyses following the current FLAG guidance, as well as the additional information (Method 6) analysis, demonstrate that Unit #6 would have impacts on visibility that have typically been considered adverse for other proposed sources.

NCDAQ Response - The project, as proposed by the applicant, did not trigger the PSD requirements for SO_2 and/or NO_x and therefore did not require an analysis of impacts on Class I areas. The commenter apparently conducted modeling of visibility impacts based on the assumption that the permitting of Unit 6 would result in a net increase in SO2. NCDAQ does not know what levels of increase were assumed in the FLM analysis. As noted above, as a result of the project, NCDAQ expects a decrease in SO_2 emissions from the Cliffside facility of approximately 26,000 tons per year. The project did trigger PSD for PM-10 and NCDAQ performed all required impacts analyses for this pollutant. It is important to note that the commenter did not assert that the project would have an adverse impact on Air Quality Related Values (AQRVs).

FLM-12 NCDENR must show how issuance of this permit, in conjunction with other growth in the area, will allow it to meet its "reasonable progress" obligation.

NCDAQ Response - The proposed project was required to undergo PSD review for each pollutant for which there was a significant emissions increase. To the extent that "reasonable progress" is a requirement of the regional haze

program, the NCDAQ is currently developing and working with EPA Region IV and the FLMs on a regulatory structure to satisfy "reasonable progress" requirements. Since the project as permitted will result in a significant reduction in SO_2, the final permit is consistent with those efforts.

FLM-13 The FLM's acid deposition analysis indicates impacts greater than the FLM's Deposition Analysis Thresholds (DAT) for total sulfur.

NCDAQ Response - The project, as proposed by the applicant, did not trigger the PSD requirements for SO_2. The project does not result in a significant emissions increase of SO_2. The project is expected to result in an actual emissions decrease of approximately 26,000 tons.

FLM-14 The resulting increase in mercury deposition coupled with the predicted increase in sulfur deposition could impact park resources, including threatened and endangered species.

NCDAQ Response – The table below shows the expected decrease in mercury emissions. Expected actual emissions are based on Units 5 & 6 operating at a 80% capacity factor.

2002-2003 Baseline Actual Emissions (Units 1-5)	**Expected Actual Emissions (Units 5 and 6)**	**Decrease in Actual Emissions**
156 pounds	78 pounds per year (assuming 100% bituminous coal in Unit 6)	78 pound/year
156	115 pounds per year (assuming 100% sub-bituminous coal in Unit 6)	41 pound/year

FLM-15 If the netting is ultimately not allowed, Duke Energy should reassess its impacts at Great Smoky Mountains NP and implement appropriate mitigation measures to lower its impacts to acceptable levels.

NCDAQ Response - See response to EPA-1.

FLM-16 Regardless of whether or not the netting is allowed, the real-world effect of Unit #6 by itself would be severe impacts upon air quality and air quality related values at Great Smoky Mountains NP.

NCDAQ Response - This project will result in the retirement of several older coal-fired power plants including Units 1-4. The permit also reflects the installation of a scrubber at Cliffside Unit 5 that will result in significant additional reductions in SO_2 emissions. Even after addition of the new unit (Unit 6) the NCDAQ expects a decrease in SO_2 emissions of approximately 26,000 tons per year. The NCDAQ believes that a 26,000 ton-per-year decrease in emissions will benefit air quality related values at GSMNP.

2.3 SELC Comment letter to Donald van der Vaart from Marily Nixon and Gudrun Thompson dated October 31, 2007

The following comments were received from the Southern Environmental Law Center on behalf of itself, Carolinas Clean Air Coalition, Environment North Carolina, Environmental Defense, National Parks Conservation Association, Natural Resources Defense Council, North Carolina Conservation Network, North Carolina Waste Awareness and Reduction Network, Sierra Club, North Carolina Chapter and Southern Alliance for Clean Energy.

SELC-1 Available Information For Preliminary Determination

NCDAQ Response - NCDAQ provided documentation in accordance with all applicable requirements.

SELC-2 Increment Consumption

NCDAQ Response -The Class II increment consumption for PM_{10} was given in the public notice. Modeling for the Class I PM_{10} increment consumption was not required since the Class I Significant Impact Levels (SILs) were not exceeded for PM_{10} for any of the Class I areas. Determination of increment consumption for SO_2 and NO_x was not required since these pollutants were not subject to PSD review and therefore they are not required to be modeled for increment consumption. The final permit nevertheless includes emission limits for both NO_x and SO_2 that are as stringent as any BACT limits for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coals.

SELC–3 NCDAQ Erred in Calculating the Baseline Actual Emissions

NCDAQ Response - The project is not subject to New Source Review (NSR) for SO_2 and NO_x. Senate Bill 1587 allows any application determined to be administratively complete on or before August 1, 2006 to be exempt from the requirement at 15A NCAC 2D .0530(b)(1)(A)(iv) to adjust downward the baseline emission rate for any emissions reductions under General Statute 143-215.107D (Clean Smokestacks Act).

NCDAQ considers an application to be administratively complete when all items necessary to begin processing the application have been received. These items are listed in the acknowledgement letter NCDAQ sends to the applicant on all applications: appropriate processing fee, appropriate number of copies, zoning consistency determination, Reduction and Recycling Activities Form, signature of authorized official, and appropriate PE seal. For the Cliffside project, these items were received by December 21, 2005. The items mentioned

by SELC (a reduction in number of units; a change in the analysis allowing the avoidance of PSD review for NO_x as well as SO_2; a change in the emission controls; alteration of the site layout of the facility; and revised modeling) can change after processing has begun. The items mentioned by SELC are typical of additional information that may be submitted after the application is considered administratively complete.

SELC-4 Netting

NCDAQ Response - See response to comment to EPA-1 above.

SELC-5 NCDAQ Has Improperly Allowed Duke to Use a Longer Lookback Period In Defining Baseline Actual Emissions for NOx

NCDAQ Response - As the application was deemed administratively complete on December 21, 2005, the 5-year look-back period covers calendar years 2001 and 2002. (2D .0530(b)(1)(A))

SELC-6 NCDAQ Erred in Determining the Potential to Emit of the New Unit 6's SO2 and NOx Emissions (and EPA comment 2)

NCDAQ Response - See Response to EPA-2

SELC-7 NCDAQ Improperly Determined Whether a Significant Net Emissions Increase Will Occur as a Result of the New Unit 6 and Associated Units

NCDAQ Response - It is standard practice to allow an applicant to take practically enforceable conditions limiting emissions. In order to make the emission reductions resulting from the installation and operation of the scrubber on Unit 5 creditable for NSR purposes, Duke Energy Carolinas agreed to a permit condition requiring the operation of the Unit 5 scrubber whenever Unit 5 is operating. The emission reductions generated from concurrent operation of the scrubber are more than is necessary is avoid PSD review. The final permit, like the proposed permit, will contain a PSD avoidance cap of 25,185 as requested by the applicant.

SELC -8 Determination of Whether a Significant Net Emissions Increase Would Occur

NCDAQ Response - SELC is correct that there were two small changes in emissions that were included in Duke's May 2007 addendum, but not included in Table 4-5 of the preliminary determination. The May addendum had the correct information. Subsequent to the April 9 memoranda on SO2 and NO_x netting, Duke's engineering contractor reviewed and updated the required

engine sizes for the Unit 6 emergency generator and fire pump, and Duke included those changes in their final calculations. The emergency generator was changed from 1000 hp to 2350 hp and the fire pump was changed from 1200 hp to 430 hp. With those changes, the correct values should be as follows:

Unit 6 Emergency Generator:	NOx: 1.24 tpy	SO_2: 0.0014 tpy
Unit 6 Fire Pump:	NOx: 0.14 tpy	SO_2: 0.0003 tpy

SELC is incorrect concerning the applicable SO_2 allowable emissions. While NC regulations would allow up to 2.3 lb/mmBtu SO_2, the federal NSPS will require the use of ultra low sulfur diesel by 2010, at 15 ppm sulfur. That limit is included as the basis for the SO_2 calculations. The net effect is insignificant. The difference in SO_2 emission is negligible in either case. NOx emissions increase by 0.20 tpy compared to the two engines that were included in the previous calculations.

Also, SELC comments that the contemporaneous emissions for the Unit 5 emergency quench water pump from Permit No. 04044T26 were not included in the emissions shown in the preliminary determination. While the Unit 5 emergency quench water pump was included; however, Permit No. 04044T26 added an emergency fire water pump (ID No. FWP5) that was not included. As a result of these changes the contemporaneous creditable emission increases for the addition of Unit 5 FGD, as found in Table 4-3 of the preliminary determination, were revised. The NOx creditable emission increase went from 0.3 tpy to 0.6 tpy. The CO creditable emissions increase went from 0.2 tpy to 0.4 tpy and the VOC creditable emissions increase when from 0.3 to 0.6 tpy. These small changes did not change the resulting regulatory conclusions regarding PSD netting and avoidance as discussed in the preliminary determination.

One change that was made was that the PSD avoidance condition at 2.2 C.1.a.i of the proposed permit has been revised to state that Units 1-4 (ID Nos. ES-1, ES-2, ES-3 and ES-4) and the associated auxiliary boiler (ID No. ES-7) shall be shutdown consistent with PSD regulations with regard to netting prior to startup of the new boiler (Unit 6).

SELC -9 Even When the Alleged PSD Violations at Units 1-5 Are Ignored, There Will Be a Significant Net Emissions Increase of SO2 and NOx at Cliffside Under the Proposed Permit for Unit 6

NCDAQ Response - This comment refers to the use of 2001-2002 as the baseline rather than some more recent two-year period. As stated above, NCAC 2D .0530(b)(1)(A) provides a 5-year look-back from the date of a complete application. In this case, the permit application was deemed administratively complete on December 21, 2005; therefore, the 2001-2002 period is within the five-year window allowed by the rule. NCDAQ has determined that there will not be a significant emissions increase of NO_x and or SO_2 as a result of this project.

SELC-10 Duke Has Not Demonstrated that the SO2 Emission Reductions at Cliffside Have the Same Qualitative Significance for Public Health and Welfare as the Emission Increases from Unit 6

NCDAQ Response - See response to EPA 13.

SELC-11 Netting Qualitative Significance.

NCDAQ Response: Using different (i.e. "appropriate before and after") emissions, it is quite possible that the SELC modeling resulted in the claimed increased impacts. Since NCDAQ was not provided with the SELC modeling files, we were unable to verify the modeling or modeling assumptions. See response to EPA 13 for more discussion of modeling on netting.

SELC -12 No Analysis of Ambient Equivalence Was Conducted for Class I Area Impacts

NCDAQ Response: NCDAQ did not ask for an "equivalence" modeling demonstration because the difference in the emission points on site at Cliffside are not large enough to be discerned at the Class I area. As an estimate, the difference in stack locations is only 0.7 km (the stack height difference is even smaller), while the distance to the nearest Class I area is 62.5 km. This represents a 1% difference. Any predicted difference at that distance would be negligible.

SELC-13 The DAQ Must Require an Analysis of NOx and SO2 Emissions on PSD Increment in Class I Areas

NCDAQ Response: The project did not trigger NSR for SO_2 and NO_x and therefore modeling was not required. NCDAQ has, however, included emission limits for NO_x and SO_2 in the final permit; those limits are as stringent as any BACT limits for a similarly designed and sized coal-fired boiler firing a blend of bituminous and sub-bituminous coals.

SELC -14 The PM10 Limit Does Not Reflect BACT

NCDAQ Response - In setting the emissions level for each pollutant NCDAQ considered both the total air quality impact of the unit's emissions and the ability to achieve compliance with each limit on a consistent basis. Many of the units cited by SELC only have limits for filterable PM and have no limits for total PM (which would include condensable PM). The total PM limit for Cliffside is lower than any of the units identified by SELC. Because of the varied test methods and averaging times associated with the limits identified by SELC (taken from the FLM comments and not found in EPA's Clearinghouse

data) (0.010 lb/mmBtu vs. 0.012 lb/mmBtu for Cliffside) a direct comparison could not be made. SELC's comments with respect to actual test results confirmed the selected technology can achieve the proposed BACT limit and therefore supports the NCDAQ's conclusion that compliance with the BACT limit is expected. With respect to the Northhampton facility cited by SELC, NCDAQ notes that: the test does not provide any long term results; the unit tested is an entirely different design; the unit is approximately one-seventh the size of the proposed Cliffside unit; the type of coal was not identified; the load rate was not identified; and the operational parameters of the control systems were not provided. Moreover, the Northhampton limit is just for filterable particulate. As a result, a direct comparison of the Northhampton facility to Cliffside Unit 6 was not possible.

The final permit has been revised in response to comments to delete draft permit language allowing revision to the permitted PM limit(s) through an administrative change.

SELC-15 The CO and VOC Limits Do Not Reflect BACT

NCDAQ Response - In general, measures (such as combustion modifications using low-NO_x burners, over-fire air, etc.) used to reduce NO_x emissions can increase CO emissions. To reduce the risk for explosion, such measures are applied only to the point at which CO concentration in the flue gas reaches a maximum of about 200 ppm. See page 217 of Air Pollution Engineering Manual, 1992 and Page 1.1-4 of AP-42, 9/98. A balance needs to be attained when controlling emissions of CO/VOC and NO_x, based on the project objectives and limitations on control technologies. As noted in the preliminary determination on page 46, the proposed BACT limit for the Unit 6 boiler for CO is among the lowest as compared to recent BACT determinations and the proposed VOC BACT is lower than most of the recent BACT determinations. To force Duke to lower their CO emissions at the expense of increases in NO_x emissions would run counter to NCDAQ's efforts to minimize impacts of ozone and fine particulate formation in the surrounding airshed. NCDAQ is not aware of a BACT determination that contained both a lower CO limit and a NO_x limit lower than 0.07 lb/mmBtu.

In addition, as was included in the preliminary determination on page 46, the applicant has a vested interest in keeping NO_x emissions as low as possible in order to comply with the PSD avoidance cap of 6,370 tons/yr for emissions from Unit 5 and Unit 6 and the system-wide cap under the Clean Smokestacks Act. Based on further review, NCDAQ has determined that a somewhat lower VOC limit is achievable and the final permit sets a limit of .003 lb/mmBTU.

SELC-16 The Sulfuric Acid Mist Limit Does Not Reflect BACT

In establishing the BACT limit for Cliffside 6, the NCDAQ considered recent RBLC data for facilities burning bituminous coal and other known facilities burning similar fuel as discussed in the preliminary determination. The facilities (located in NV, KY, WY, NM and CO) identified by SELC as having proposed or final sulfuric acid BACT limits less than Cliffside 6 will burn low-sulfur western coal and therefore are not comparable. NCDAQ believes the sulfuric acid mist limit of 0.005 lb/mmBtu for Cliffside 6 is the most stringent limit that can consistently be achieved since this unit, although designed and permitted to burn a mix of coal, will burn primarily eastern bituminous high-sulfur coal.

SELC-17 NCDAQ Failed to Conduct Any BACT Review for Lead

NCDAQ Response - As stated in the BACT analysis for lead in the preliminary determination, the emission controls for lead are the same as for PM_{10}, and since the proposed units will employ BACT for PM_{10}, they will also employ BACT for lead. This is because at operating temperatures of the proposed fabric filter, lead exists as PM_{10} and is readily collected with filterable PM_{10}.

SELC-18 The Proposed Visible Emissions Limit Does Not Reflect BACT

NCDAQ Response - Opacity is not a pollutant for the purposes of PSD and there is no requirement to set an opacity limit as part of the BACT process. Opacity may, where technically appropriate, be included as a surrogate for assessing mass emissions and/or as a means to qualitatively assess control device effectiveness. (See, for example, EPA Region 8 Response to Public Comments document for the Bonanza Power Plant Project.) It is important to note the Unit 6 is required to meet the 20 % SIP opacity restriction at 15A NCAC 2D .0521.

SELC-19 The Particulate Matter BACT Limits and Requirements for Materials Handling Must Be Enforceable

NCDAQ Response - The PM_{10} BACT limits and monitoring requirements for the material handling sources in the draft permit were determined to be the overall maximum throughputs of rail car coal unloading, rail car limestone unloading, and gypsum stockout conveyor. These throughput limits and monitoring are indeed enforceable and are the controlling (bottleneck) limits that ensure all material handling sources in each of the three trains of downstream sources are below their associated PM_{10} BACT emission limits (as modeled). In addition, limestone sources are subject to the enforceable emission standards under 15A NCAC 2D .0540 in Section 2.2 B.1.

SELC-20 The BACT Analysis for the Cooling Tower is Flawed

NCDAQ Response - The proposed BACT for Cliffside 6 is drift eliminators for PM_{10} emissions. As stated in the preliminary determination, there are no cooling towers identified in the RBLC with specified control other than drift eliminators. The Desert Rock plant, which is proposing a dry cooling tower, is located in New Mexico where rainfall and water makeup to a wet cooling tower would apparently be limited.

SELC-21 NCDAQ Failed to Propose a BACT Limit for Hydrogen Fluoride

NCDAQ Response - Federal PSD rules promulgated on December 31, 2002 regulate fluoride emissions, not including hydrogen fluoride. Hydrogen fluoride is not included because hydrogen fluoride is a Section 112 Hazardous Air Pollutant.

It is widely accepted that most fluoride emissions from coal combustion are hydrogen fluoride. In general, air permit applications have addressed fluoride emissions as hydrogen fluoride. However, in response to SELC comments, and out of an abundance of caution, NCDAQ will consider that small amounts of particulate fluorides such as calcium fluoride, sodium fluoride, potassium fluoride and other compounds may also be emitted. Because fluorine is the most electronegative and reactive of all elements and a corrosive gas, which reacts with practically all organic and inorganic substances, emissions of fluorine gas are expected to be negligible.

Table 1 shows test results for particulate and gaseous fluoride emissions before control.

Table 1 Particulate and Vapor Phase Fluoride Data

Plant and Type of Fluoride	**ESP Inlet**	
	ug/Nm^3	**% of total**
Yates Unit 1(bituminous) [(a)]		
Fluoride Particulate	1.3	0.016%
Vapor Phase Fluoride	8,300	99.984%
Coal Creek Unit 1 (lignite) [(b)]		
Fluoride Particulate	17.0	0.635%
Vapor Phase Fluoride	2,660	99.365%
Niles Boiler No. 2 (bituminous) [(c)]		
Fluoride Particulate	385.0	3.608%
Vapor Phase Fluoride	10,287	96.392%

(a) "A Study of Toxic Emissions from a Coal Fired Power Plant Utilizing an ESP while Demonstrating the ICCT CT-121 FGD Project", U. S. Department of Energy Report No. DOE/PC/93253-T1 (DE94016053). June 1994

(b) "A Study of Toxic Emissions from a Coal Fired Power Plant Utilizing an ESP/Wet FGD System", U. S. Department of Energy Report No. DOE/PC/93251-T2 (DE94017941). June 1994

(c) "A Study of Toxic Emissions from a Coal-Fired Power Plant Niles Station Boiler No. 2." June 1994.

Assuming that 100% of the fluorine in the coal is released as either flyash (particulate fluoride) or gaseous fluorides, the above test results show that fluoride emissions, not including hydrogen fluoride, are less than 5% of the fluorine content in the coal and possibly much lower.

Table 2 presents estimates of fluoride emissions, not including hydrogen fluoride, for the Duke Cliffside Unit 6 project. These calculations are based on the conservative assumption that 1% of the fluorine in the coal will be present in the flyash before control. Fluoride containing flyash particles are expected to be similar to other flyash particles and are expected to be controlled at similar efficiencies. It is clear that fluoride emissions will be below the PSD significant emission rate of 3 ton/yr.

Table 2 Cliffside Unit 6 Fluoride Emission Estimate

	Maximum Probable Emissions	
Fluoride in coal	145	ppm annual average
Coal feed rate	3,667,129	ton/yr
Fluoride in feed rate	532	ton/yr
Fluoride in flyash	5%	
Fluoride in flyash	26.59	ton/yr
Flyash before control	796,651	ton/yr
PM emissions	515.7	ton/yr
PM control efficiency	99.935%	
Fluoride emission control efficiency	99.935%	
Fluoride emissions	**0.0172**	**ton/yr**

In addition to the above analysis, although not required, the NCDAQ compared the ambient concentration of hydrogen fluoride resulting from the post-modification operating scenario to the Acceptable Ambient Level Guidelines contained in 15A NCAC 2D .1100. The post-modification ambient concentration is expected to be 8.07 ug/m3 which is only 3.2% of the 1-hr Acceptable Ambient Level Guidelines for hydrogen fluoride.

SELC-22 The BACT Emission Limits May Not Allow Excess Emissions

NCDAQ Response - The permit (Section 2.1 J.2.d) has been revised to indicate that the PM_{10} emission limits (the only pollutant limit where monitoring would be by other than a stack test and therefore subject to occurring at startup and shutdown) apply at all times except as described in Section 2.1 J.2.g of the permit.

SELC-23 Mercury Emissions from Cliffside Unit 6 Would Exacerbate the Already Serious Public Health Threat of Mercury Pollution in North Carolina

NCDAQ Response - NCDAQ has established rules that go beyond Federal rules to reduce mercury emissions from existing coal-fired electric generating units and limit emissions from new coal-fired electric generating units. The application of those rules to the Cliffside project is discussed in the preliminary determination. In response to comments, NCDAQ recalculated the mercury emissions limits for the project; the emission limits in the final permit will result in significant reductions in mercury emissions. See FLM-14 for more information on reductions in mercury emissions that will result from modifications authorized under this permit.

SELC-24 The Clean Air Act Requires the Proposed Unit to Meet Emissions Limits Corresponding to Installation of Maximum Available Control Technology

NCDAQ Response - Section 112 of the Clean Air Act has been implemented, to date, for utilities solely through CAMR (implemented through NSPS Subpart Da). As mentioned above, North Carolina has passed an additional rule limiting mercury emissions from utility boilers. Both of these requirements are reflected in the permit.

SELC-25 North Carolina's Mercury Rule Requires BACT for New Coal-Fired Units

NCDAQ Response - The mercury emissions from Cliffside Unit 6 are regulated under the federal New Source Performance Standards (NSPS) at 40 CFR 60 Subpart Da, and under North Carolina's rules for mercury control from electric generators as found in 15A NCAC 2D .2500.

Revised NSPS Subpart Da mercury emission limits were promulgated at 71 FR 33400 (June 9, 2006). EPA set the federal mercury emission standard for sources burning bituminous coal at 0.020 lb/GW-hr. EPA set the mercury emission limit for units burning sub-bituminous coal at 0.066 lb/GW-hr and

0.097 lb/GW-hr for sources located where the annual rainfall is > 25 inches/year or less than 25 inches per year respectively.

North Carolina's rules for mercury control from electric generators have been the determining factor in setting the mercury emissions limit for Unit 6. The NC mercury emission rules, at 15A NCAC 2D .2511(f), require that new coal-fired electric steam generating units install and operate best available control technology (BACT), as identified by the Director of the NCDAQ, for mercury emissions. BACT emission limits may not exceed allowable emissions under NSPS 40 CFR Part 60.

The installation of SCR, a bagfilter with acid gas control, and a wet FGD system meet the technology requirements under 15A NCAC 2D .2511. The bagfilter and the wet FGD system are both recognized control systems for mercury and thus represent a layering of mercury controls. It is important to note that in adopting the State rules addressing mercury emissions from existing electric generating units, the Environmental Management Commission expressly indicated that compliance in the first phase of implementation would be achieved through the co-benefits of controlling emissions of NO_x and SO_2.

The NCDAQ is aware of the application of sorbent injection as a method to possibly increase the mercury reduction from levels that would already be obtained from the proposed emission control system. However, the benefit obtained by layering sorbent injection on the existing emission control system is unclear since there is little, if any, long term experience with such systems on large coal fired electric utility boilers. A recent DOE/NETL paper on sorbent injection concluded that "additional research and development is required before it is considered commercial technology for coal power plants".

The NO_x and SO_2 controls required at Unit 6 represent BACT for mercury at this time. Since mercury is not a PSD pollutant, there are no BACT limits for mercury from other states to compare to the proposed limit for Cliffside Unit 6. Mercury emissions data referenced in the comment did not represent BACT limits. The data was based on one 3-hour stack test at each facility. Those results are not comparable to the proposed emissions limit for Unit 6 which is a one-year rolling average.

Because of the limited data available on actual mercury emissions, NCDAQ was required to make a judgment as to the lowest achievable mercury emissions limit for Unit 6. The limit for Unit 6 was influenced by the fact that Duke will burn a mix of bituminous and sub-bituminous coal. The NCDAQ concluded that a single mercury emission limit would allow for more effective enforcement than would be possible using different limits for each type of coal. In the final permit, the BACT emission limit under 15A NCAC 2D .2511 (state-only) in Section 2.1 J.10.b of the final permit has been changed to 0.019 lb/GW-hour gross output for all coals fired in Unit 6. This blended coal limit is lower

than the current NSPS limit for bituminous coal and significantly lower than the current NSPS limit for subbituminous coal (0.066 lb/GW-hr).

NCDAQ believes the limit of 0.019 lb/GW-hour represents the most stringent limit that can be achieved consistent compliance with the mercury emission standard for all coals. The potential emissions from just Unit 6, based on 100% full load capacity operating 8760 hours per year, are 133 lb/year. As noted in response to FLM-14, the expected actual combined emissions from both Units 5 and 6 are between 78 and 115 pounds per year. NCDAQ is not aware of any comparable plant burning blended coals that has a lower mercury emissions limit.

The federal Clean Air Mercury Rule imposes monitoring requirements for mercury beginning on January 1, 2009. By December 31, 2010 DAQ will evaluate relevant data and make a determination whether it is appropriate to lower the mercury limit.

SELC-26 No Modeling Was Done for Mercury

NCDAQ Response - There is currently no requirement to model mercury emitted from a source burning unadulterated fossil fuel.

SELC-27 The draft permit fails to address PM2.5 as a PSD Pollutant

NCDAQ Response - See Response to EPA 11.

SELC-28 NCDAQ Must Require Duke to Model for PM2.5

NCDAQ Response - NCDAQ did not request $PM_{2.5}$ modeling for this facility. This is in keeping with the current EPA policy (discussed above), confirmed via conference call on November 26, 2007 with Mr. Stan Krivo, Region 4. EPA has recommended, and NCDAQ has concurred, to model PM_{10} as a representative surrogate for $PM_{2.5}$.

PM-2.5 emissions from Cliffside 6 were modeled as part of NCDAQ's PM-2.5 SIP-attainment modeling demonstration and compliance with the NAAQS was demonstrated.

SELC-29 The Draft Permit Fails to Address Carbon Dioxide As a PSD Pollutant

NCDAQ Response - The NCDAQ's SIP PSD regulations incorporate EPA's federal regulations (with specific modifications in certain areas). Carbon dioxide is not currently a "regulated NSR pollutant" as defined by EPA regulations (and in turn by state regulations). On August 30, 2007, EPA issued the final permit for a new coal-fired electric utility unit at Desert's existing

Bonanza power plant in South Jordan, Utah . In its Response to Public Comments on the draft Bonanza permit, EPA discusses the issue of whether EPA has a legal obligation to regulate CO_2. EPA stated its position that carbon dioxide is not currently a regulated NSR pollutant subject to PSD review. In the response, EPA states that "regulated NSR pollutant," means a pollutant regulated in one of three principal program areas -- NAAQS pollutants, pollutants subject to a section 111 NSPS, and class I or II substance under title VI of the Act-- and any pollutant "that otherwise is subject to regulation under the Act." 40 CFR 52.21(b)(50)(i)-(iv). As used in this provision, EPA interprets the phrase "subject to regulation under the Act" to refer to pollutants that are presently subject to a statutory or regulatory provision that requires actual control of emissions of that pollutant. Because EPA has not established a NAAQS or NSPS for CO_2, classified CO_2 as a Title VI substance, or otherwise regulated CO_2 under any other provision of the Act, CO_2 is not currently a "regulated NSR pollutant."

In Massachusetts v. EPA, 127 S. Ct. 1438, 1462 (U.S. 2007), a case cited by commenters, the Supreme Court held that CO2 and other greenhouse gases are "air pollutants" under the Clean Air Act. The Court held further that "If EPA makes a finding of endangerment, the Clean Air Act requires the agency to regulate emissions of the deleterious pollutant from new motor vehicles", and that "EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do."

However, the Court also ruled, "We need not and do not reach the question whether on remand EPA must make an endangerment finding, or whether policy concerns can inform EPA's actions in the event that it makes such a finding. We hold only that EPA must ground its reasons for action or inaction in the statute." 127 S. Ct. at 1463. As of this time, EPA has made no endangerment finding or issued regulations requiring control of CO_2 emissions under the Act.

It is well established that "EPA lacks the authority to impose [PSD permit] limitations or other restrictions directly on the emission of unregulated pollutants." *North County Resource Recovery Assoc.*, 2 E.A.D. 229, 230 (EAB 1986).

Since EPA has not yet issued regulations requiring control of CO_2 emissions under the Act, the NCDAQ concludes that CO_2 is not a regulated NSR pollutant for which a BACT analysis or emission limit is required in the Cliffside permit.

SELC-30 CO2 Must Be Considered In the BACT and the Collateral Impacts Analysis and Alternatives Analysis Under Section 165(a)(2)

NCDAQ Response - In the BACT analysis, the collateral environmental impacts include consideration of emissions of unregulated pollutants and whether those emissions would affect the selection of the best available control technology. There is no evidence that consideration of the environmental impacts of CO_2 emissions would result in selection of a different control technology than previously determined in the preliminary determination for any regulated NSR pollutant. Emissions of CO_2 will not be different among the various control technologies considered and therefore selection of BACT is not affected. The control technology chosen has nothing to do with the thermal efficiency of the source.

Several commenters provided comments regarding alternatives to proposed coal-fired boiler. Alternatives identified included solar and wind power. As a threshold matter PSD does not contain a requirement like Section 173(a)(5) of the CAA which requires that New Source Review in non-attainment areas include an analysis of alternative sites, sizes, production processes, and environmental control techniques to demonstrate that the benefits of the source outweigh its cost. In addition, comments related to the need of the facility are also outside the scope of the PSD requirements. However, as noted in response to comments, the North Carolina Utilities Commission did evaluate the need for the proposed project and concluded that the applicant had demonstrated need.

With respect to wind and solar, according to the application, the unit is intended to operate as a baseload unit requiring a constant output. The commenters did not provide sufficient detail to demonstrate that a wind or solar plant would be an acceptable and reliable alternative to a base-load coal-fired power plant in North Carolina. In addition, North Carolina has a Mountain Ridge Protection Act (N.C.G.S. § 113A-205) that limits the ability to install and operate wind turbines in Western North Carolina a location with some of the highest potential for winds sufficient to support a turbine project. (see http://rredc.nrel.gov/wind/pubs/atlas/maps/chap2/2-01m.html)

SELC-31 The Permit Should be Denied Because Under NC Law Carbon Dioxide Pollution Would Be Injurious To Human Health and Welfare

NCDAQ Response - CO_2 is not considered a regulated NSR pollutant and therefore there is no basis for denying the permit.

SELC-32 NCDAQ Failed to Analyze IGCC as BACT

NCDAQ Response - See response to FLM 2.

SELC-33 The Cumulative PM-10 and TSP Modeling is Flawed

NCDAQ Response to Start-up and Shutdown Emissions - The permit (Section 2.1 J.2.g) has been revised to indicate that the PM_{10} emission limits apply at all times except as described in Section 2.1 J.2.g of the permit.

NCDAQ Response to Background values – NCDAQ has an extensive monitoring system for all NAAQS pollutants. The PM_{10} and TSP monitors used in the analysis were representative for the Duke Cliffside area.

NCDAQ Response to Minor Source Baseline date - This date is determined by the first PSD application submitted for the county. The PM_{10} minor source base-line date for Cleveland County is 4/30/79.

SELC-34 The Charlotte/Douglas, NC Airport Met Data Are Unacceptable for NAAQS and PSD Air Dispersion Modeling

NCDAQ Response - Section 6.7 of the "Meteorological Monitoring Guidance for Regulatory Modeling Applications" explicitly states that "...Although on site meteorological data is preferred, representative airport data continue to be acceptable for use in modeling." Recognizing the airport data limitations, the modeling requires 5 years of airport data vs. only a single year of on-site data for an air dispersion modeling analysis. Furthermore, EPA designed AERMET to ingest/process National Weather Service (NWS) meteorological data collected at airports. Wind rose data for Greensboro and Charlotte indicate that the western piedmont and the Cliffside facility site are controlled by the same meteorological regime.

SELC-35 Preconstruction Met Monitoring Should have Been Required

NCDAQ Response - NCDAQ has determined the Charlotte/Douglas data is both representative and appropriate for the climatological regime encompassing Cliffside.

SELC-36 Duke Did Not Perform A Complete Analysis of the Impact on Soils and Vegetation

NCDAQ Response - Duke Energy Carolinas accomplished an inventory of soils, flora and fauna of the area surrounding the facility as required in the NSRWM, Section D, Additional Impact analysis. NCDAQ found the inventory to be adequate and complete. NCDAQ also concurs in the applicant's conclusion that no further or additional degradation will occur as part of this project.

SELC–37 Duke Did Not Perform a Complete Analysis of the Growth Associated with the Project

NCDAQ Response - Duke Energy Carolinas accomplished a Growth Analysis associated with the project as required in the NSRWM, Section D, Additional Impact Analysis. Although the temporary work force increase during the construction phase of the project will be substantial, PSD guidance does not require consideration of this type of growth impact. The Growth Analysis does consider the long-term work force increase of approximately 100 workers, but concludes that the existing local population will provide most of this workforce and thus no or little new growth will result from this facility.

Delivery trucks for the plant (Unit 5 and 6) are expected to average 6 trucks per day after Unit 6 begins operation. Rail deliveries for the plant are expected to average 8-9 trains per week after Unit 6 begins operation. It is expected that any impacts from these off-site activities will be minimized by new requirements for ultra low sulfur diesel fuel and new engine technology being employed for new trucks and rail locomotives. New regulations for diesel fuel will result in a 97% decrease in vehicular SO_2 emissions by 2010.

SELC-38 SELC states that NCDAQ must correct the serious flaws in the draft permit then re-issue a revised draft permit for full public review and comment.

NCDAQ Response - The changes to the draft permit (as discussed herein) are changes that flow naturally from the hearing process and generally result in more stringent permit requirements. Re-notice of another draft permit is not necessary since the changes fall within the scope of issues that were already before the public for review during the previous comment period.

SELC Comment letter to Donald van der Vaart from Marily Nixon and Gudrun Thompson dated November 15, 2007

The following additional comments were received from the SELC as a supplement to their letter of October 31, 2007. In addition, SELC wishes to incorporate by reference and adopt the NPS comments submitted October 31, 2007 (response contained herein).

SELC-39 NCDAQ Must Require A Class I Modeling Analysis for SO_2 and NO_x

NCDAQ Response - See response to comment EPA-13 above.

SELC-40 Ambient Equivalence Modeling Must Be Conducted for Class I Impacts

NCDAQ Response - See response to comment SELC-11 and 12 above.

SELC-41 NCDAQ Must Require Duke to Re-Model Class I Impacts Using Natural Background Visibility Conditions

NCDAQ Response - See response to comment FLM-5 above.

SELC-42 NCDAQ Should Deny the Proposed Permit Due to Adverse Impacts on AQRVs

NCDAQ Response – See Generally Response to FLM Comments.

2.4 Duke Energy Carolinas letter to Donald van der Vaart from James L. Turner dated October 31, 2007

Duke Energy Carolinas submitted detailed comments that include their position on the need for Cliffside Unit 6 and their response to other public comments submitted to NCDAQ. Duke Energy urges NCDAQ to issue the permit as drafted.

2.5 Duke Energy Carolinas Letters

In a December 31, 2007 letter, Duke Energy Carolinas requested the addition of emission limits for sulfur dioxide and nitrogen oxides from unit 6. The limits are consistent with some of the most stringent BACT requirements for similar sized, similarly designed coal-fired boilers firing a similar fuel type.

In addition to these limits, Duke Energy Carolinas also requested that the greenhouse gas reduction plan included in the letter be attached to the permit. The plan has been included as an attachment to the permit.

In a subsequent letter dated January 28, 2008, Duke Energy Carolina's also agreed with a permit condition requiring the concurrent operation of the scrubber on Unit 5 when the Unit is operating.

2.6 Report of Proceedings from the public hearing held September 18, 2007

A public hearing on the proposed Cliffside 6 modifications was held at 6:00 PM at Chase High School in Forest City. Ms. Margaret Love, Winston-Salem Regional Office Supervisor, addresses the concerns raised by the people who spoke at the hearing as well as related public comments. Ms. Love recommends issuance of the permit with certain recommendations for changes to the draft permit and for changes from the preliminary determination to be covered in the final determination. (See Appendix B for a copy of the hearing officer's full report)

2.7 Director's Recommendations

Mr. Keith Overcash, Director of NCDAQ, agreed with, and took action on all of the hearing officer's recommendations. This Section provides a summary of the Permit Section's response to the Director's Recommendations.

Recommendation 1

The Permitting Section should ensure that the air quality analysis for carbon monoxide and particulate matter are reflected in mass emission rates based on the maximum hourly heat input rate for the unit

Resolution: The permit will be revised to include an enforceable limit for maximum hourly heat input to Unit 6. The *potential to emit* numbers for SO_2 and NOx have no effect on whether or not there is a *significant net emissions increase* because the PSD avoidance limits will prevent any *significant net emissions increase*. See Specific Conditions 2.1 J.(2)(h) for Unit 6 and 2.1 K.(5)(d) for the auxiliary boiler.

Recommendation 2

The Permitting Section should ensure that the emissions from the emergency generator and firewater pump are characterized accurately.

Resolution: These emission calculations were reviewed and the summary of that review and changes appear in response to SELC-8.

Recommendation 3

In accordance with the netting analysis for Cliffside Unit 6, the permit should require that Units 1 through 4 are shut down simultaneous with or prior to operation of Unit 6. In addition, the permit should require operation of the unit 5 wet flue gas desulfurization system at the same time.

Resolution: The PSD avoidance condition at 2.2 C.1.a.i of the final permit has been revised to state that Units 1-4 (ID Nos. ES-1, ES-2, ES-3 and ES-4) and the associated auxiliary boiler (ID No. ES-7) shall be shutdown prior to startup of the new boiler (Unit 6). In addition this permit condition requires the operation of the Unit 5 wet flue gas desulfurization system in the same time frame.

Recommendation 4

The Permitting Section should verify that the comparison of before and after Unit 6 operation SO2 and NOx emissions was accurately performed and properly explained.

Resolution: See Response Comment SELC-10. The Permits section verified that the reductions are qualitatively equivalent and therefore no change to the permit is necessary.

Recommendation 5
The Permitting Section should clarify this section of the permit review.

Resolution: The Response to Comment SELC-12 includes a clarification on how the analysis was performed. No change to the permit is necessary.

Recommendation 6
Since PSD review was not triggered for NOx and SO2, no Class I increment analysis is required under federal law.

Resolution: The hearing officer's recommendation did not require any change to the permit.

Recommendation 7
Any changes to the PM10 limits will require a non-administrative permit modification.

Resolution: The final permit has been revised to remove the draft permit language allowing modification of the PM10 limits by administrative change.

Recommendation 8

The Permitting Section should re-evaluate the treatment of opacity as a PSD regulated pollutant given recent EPA decisions in this regard.

Resolution: The Permitting Section has reviewed the treatment of opacity as a PSD pollutant. The issue of separate BACT limits for opacity is addressed in more detail in response to SELC-18.

Recommendation 9

The Permitting Section should clarify startup and shutdown requirements in the permit and review.

Resolution: In response to EPA-8, the NCDAQ clarified that the BACT limits are applicable at all times. Excess emissions that occur during startup and/or shutdown are already addressed through the SIP approved provisions of 15A NCAC 2D .0535.

Recommendation 10
The Permitting Section should re-evaluate the mercury BACT pursuant to North Carolina's mercury rule.

Resolution: The BACT emission limit under 15A NCAC 2D .2511 in Section 2.1 J.10.b of the final permit has been changed to 0.019 lb/GW-hour gross output for all coals fired. See response to SELC-25.

Recommendation 11

The Permitting Section should coordinate with the Planning Section to verify that Cliffside Unit 6 was evaluated in the PM2.5 attainment demonstration.

Resolution: The Planning Section of the NCDAQ performed sensitivity runs to the PM2.5 attainment demonstration. The emissions used in the demonstration were reflective of the pre-project emissions outlined in the 2006 CSA compliance plan. The total emissions from Cliffside were estimated to be approximately 38,017 tons of SO2 per year. At this rate all monitors in the state were projected to be well below the annual standard of 15 ug/m3. As discussed in response to EPA-13, as a result of the permit requirements, the NCDAQ expects an emissions reduction of approximately 26,000 tons of SO2 emissions from the baseline actual emissions at Cliffside. It stands to reason that if the pre-project impacts based on facility-wide emissions of 38,017 tpy of SO2 demonstrated impacts below the NAAQS, then the post-project emissions of will not have any adverse impact on PM2.5 levels. Note that this analysis was not part of the PSD or permit review for this project but was performed independent of the regulatory review. This information is provided solely in response to comment.

Recommendation 12

The permitting section should re-evaluate the impact of vehicular and rail traffic.

Resolution: Duke was asked to provide some additional information regarding this issue. Delivery trucks for unit 5 alone average 2 trucks per day. The expectation is that truck deliveries would be increased to 6 trucks a day to support units 5 and 6. Rail deliveries have averaged 2.8 trains per week to supply units 1-5. With the shutdown of units 1-4 and the addition of unit 6, train deliveries are expected to increase to approximately 8.4 trains per day. As far as impacts, the total deliveries by truck and rail are not significant and the increase in traffic will be minimized by the new requirements for ultra low sulfur diesel and new technology being deployed for trucks and rail locomotives.

Recommendation 13

The permitting section should clarify that emissions were evaluated for a mixture of coal types in the permit review and include appropriate averaging periods in the permit.

Resolution: See Response to EPA-4 and EPA-5.

Recommendation 14

The permitting section should ensure that the PM BACT discussion for the auxiliary boiler in the permit review is clear and accurate.

Resolution: See response to EPA-6 for discussion of BACT limits.

Recommendation 15

The permitting section should ensure that the modeling discussion in the permit review is clear and accurate.

Resolution: The permits section verified that the modeling for ambient impact was expanded through response to comments. See response to EPA-13, FLM-5, FLM-10, FLM-11, SELC-10, SELC-11, SELC-12, and SELC-13.

3.0 FINAL DETERMINATION

The NCDAQ, Permitting Section has concluded its review of the permit application and made a final determination that the proposed project will comply with all applicable North Carolina Environmental Management Commission air pollution regulations, including the PSD requirements. This conclusion was based on meeting the following requirements:

1 Apply the Best Available Control Technology on a case-by-case basis to each emission unit that will emit any amount of a significant pollutant, including a demonstration that emission of air toxics will not exceed the acceptable ambient levels (AALs) as regulated by the NCDAQ,

2 Perform an air quality analysis to demonstrate that for each pollutant that triggered review neither allowable PSD ambient air increments nor National Ambient Air Quality Standards (NAAQS) will be violated as a result of emissions from the proposed project,

3 Perform an analysis to demonstrate that emissions from the proposed project will neither cause adverse impacts to soils and vegetation nor cause degradation of visibility, and that economic growth associated with the project will not cause a significant increase in regional air pollutant levels,

4 Demonstrate that air emissions resulting from the proposed project will not adversely impact any PSD Class I area, and

5 Undergo adequate public participation including public notice, public hearing and a 30-day public comment period.

Therefore, the NCDAQ, Permitting Section will issue Air Permit No. 04044T28 with specific conditions and emission limits, for the construction and operation of the Cliffside 6 modifications.

This final determination, the Hearing Officer's Report and Recommendations, and all comments are available for public inspection at NCDAQ's Central Office in Raleigh and NCDAQ's Asheville Regional Office. Also, the final determination and the Hearing Officer's Report and Recommendations are posted on NCDAQ's website at http://NCDAQ.state.nc.us/permits/psd/cliffside.shtml.

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D