Supplement to the South Carolina 8-Hour Ozone Attainment Demonstration Originally Submitted August 31, 2007

For the Portion of York County, South Carolina Within the Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO)

Part of the Charlotte-Gastonia-Rock Hill, NC-SC 8-Hour Ozone Nonattainment Area

Prepared by the
South Carolina Department of Health and Environmental Control

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Bureau of Air Quality

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Appendix S.1: Attainment Test

I. Introduction

On November 17, 2008, the United States Environmental Protection Agency (EPA) notified the South Carolina Department of Health and Environmental Control (SCDHEC) that it would not approve the South Carolina 8-hour Ozone Attainment Demonstration State Implementation Plan (SIP) submitted August 31, 2007, for the Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO) part of the Charlotte-Gastonia-Rock Hill, NC-SC 8-hour Ozone Nonattainment Area (Metrolina nonattainment area), because it believed this area was unlikely to attain the 1997 8-hour ozone standard of 0.08 ppm (effectively 0.084 ppm due to rounding) by June 15, 2010, or meet the requirements for a one-year extension of the attainment date. The EPA offered the option of requesting a reclassification ("bump-up") from Moderate to Serious, with the alternative being disapproval of the 8-hour ozone attainment demonstration.

On December 22, 2008, after serious consideration of the consequences that would result from either of the options presented by the EPA, and much consultation and discussion with stakeholders in the area and with the NC Department of Environment and Natural Resources (NCDENR) Division of Air Quality (DAQ), SCDHEC determined that it was in the best interest of all parties involved to withdraw the 8-hour ozone attainment demonstration for the area. As stated in the aforementioned correspondence, SCDHEC did not take that decision lightly. SCDHEC felt it was premature for the EPA to force this action, as the 2009 ozone season had not even occurred, and it was still possible for the area to qualify for a one-year extension as allowed under the Clean Air Act. SCDHEC agreed to work with NCDENR DAQ to address the attainment demonstration, with the intent of resubmitting that portion of the SIP to the EPA by November 30, 2009.

In the May 8, 2009, *Federal Register*, the EPA issued a "Finding of Failure to Submit State Implementation Plans Required for the 1997 8-Hour Ozone National Ambient Air Quality Standard; North Carolina and South Carolina," (*FR Vol. 74, No. 88, May 8, 2009*). In this action, the EPA found that North Carolina and South Carolina failed to submit the required moderate-area attainment demonstration SIP submittals for the Charlotte area for the 1997 8-hour ozone standard. This finding started the sanctions clock and a 24-month clock for the promulgation of a Federal Implementation Plan by the EPA.

In addressing the May 8, 2009, "Finding of Failure to Submit," SCDHEC worked with the EPA Region 4 and the interagency consultation partners on a revised attainment demonstration. The technical work and air quality modeling that has been conducted since the attainment demonstration was withdrawn further indicates continued improvement of air quality and attainment of the 1997 ozone standards. Additionally, all of the monitors in the Metrolina nonattainment area recorded ozone values below the 1997 8-hour ozone standard for the entire 2009 ozone season, thus qualifying the area for a one-year extension to the attainment date. During the monthly conference call with the EPA on October 21, 2009, and subsequent discussions on November 4, 2009, the EPA presented as an option resubmittal of the original attainment demonstration submitted in 2007, along with additional information to include weight of evidence with the 2011 modeling and actual air quality data from 2009.

In a November 13, 2009 letter SCDHEC formally notified EPA that, based on current air quality, it was resubmitting South Carolina's aforementioned 8-hour Ozone SIP that was originally submitted August 31, 2007 and that supplemental information to include 2011 modeling and actual air quality data for 2009 would also be provided. Although the 2007-2009 design value for the County Line monitor in North Carolina is above 0.084 parts per million

(ppm), as shown in Table 3 on page 4, the 4th maximum value for all Metrolina area monitors for the 2009 ozone monitoring season, shown in Table 2, is below 0.085 ppm. The Metrolina area is therefore eligible to request a one-year extension of the attainment date. SCDHEC plans to request a one-year extension. The purpose of this document is to satisfy the EPA's request for supplemental information demonstrating attainment by June 15, 2010. On December 10, 2009, the EPA indicated through electronic mail that the following supplemental information would be required in addition to the attainment demonstration first submitted in 2007:

- the new 2011 modeling;
- updates to the air quality analysis including ambient data for the 2009 ozone season;
- updated information on emissions and controls that would affect the air quality for the 2010 ozone season; and
- nitrogen oxide (NO_x) Motor Vehicle Emissions Budget (MVEB) (was included in 2007 SIP submittal)
- volatile organic compound (VOC) MVEB.

This document will address the supplemental information that the EPA has requested.

II. 2011 Modeling – Attainment Test Results for 2011

Modeling for the 2011 ozone season for the Metrolina area was prepared by the NCDENR DAQ. Information concerning the model setup can be found in Section II of the original attainment demonstration submitted on August 31, 2007. Table 1 below lists the attainment test results for the Metrolina nonattainment area for 2011. The first column is the monitoring site, followed by the base year design value (DVB) discussed in Section V. A. of the attainment demonstration. The next series of columns are the calculated relative response factor (RRF) and the resulting future design value (DVF) for 2011. Monitors with DVFs that fall in the additional weight of evidence requirement are bolded. More detail is provided in Appendix S.1, Attainment Test.

Table 1: Attainment Test Results for 2011

Monitoring Site	County	DVB (ppm) 5-year weighted 2000-2004	2011	
			RRF	DVF (ppm)
Arrowood	Mecklenburg	0.0847	0.854	0.072
County Line	Mecklenburg	0.0973	0.846	**0.082**
Crouse	Lincoln	0.0907	0.829	0.075
Enochville	Rowan	0.0970	0.837	0.081
Garinger	Mecklenburg	0.0953	0.862	**0.082**
Monroe	Union	0.0870	0.858	0.074
Rockwell	Rowan	0.0973	0.837	0.081
York	York, SC*	0.0830	0.841	0.069

*Represents that portion of the county that is located in the Metrolina nonattainment area.

III. Updated Air Quality Analysis including Ambient Data from the 2009 Ozone Season

As shown in Table 2 and Figure 1, annual values (4th high readings) at the York monitor and for the entire Metrolina nonattainment area have been trending downward. Table 2 shows annual

values for the Metrolina nonattainment area for the time period since the South Carolina 8-hour Ozone Attainment Demonstration for the South Carolina portion of the Metrolina nonattainment area (the York County nonattainment area) was submitted on August 31, 2007. Figure 1 shows the trend in annual values over ten years. The annual value for the York monitor for the 2009 ozone season is 0.062 ppm. South Carolina ambient ozone concentration data and the verified, quality assured data for the York ozone monitor have been submitted to EPA's Air Quality System.

Table 2: Fourth Highest 8-Hour Ozone Values (ppm) for Metrolina Nonattainment Area 2007-2009

Monitoring Site	County	2007	2008	2009
Crouse	Lincoln	0.085	0.079	0.065
Arrowood	Mecklenburg	0.087	0.073	0.068
County Line	Mecklenburg	0.096	0.093	0.071
Garinger (Plaza)	Mecklenburg	0.093	0.085	0.069
Enochville	Rowan	0.095	0.082	0.073
Rockwell	Rowan	0.096	0.084	0.071
Monroe	Union	0.082	0.080	0.067
York	York County, SC	0.080	0.075	0.062

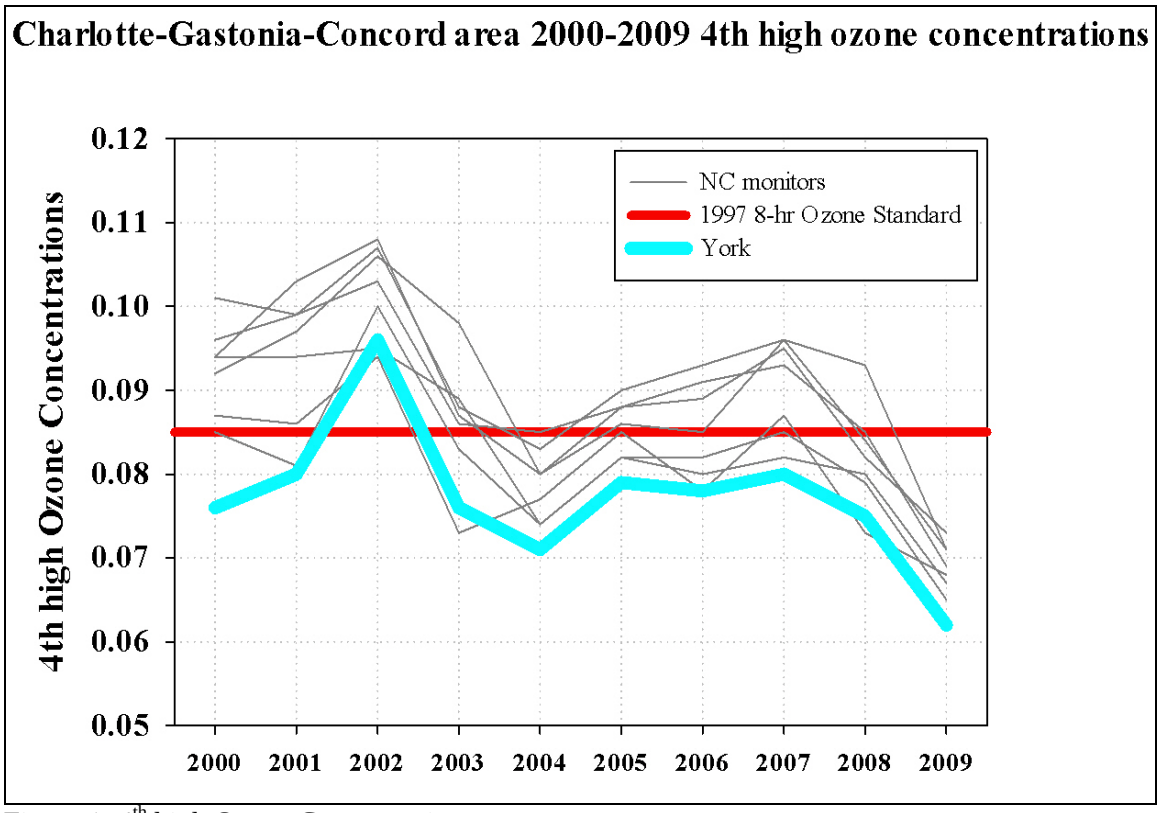

Figure 1: 4th high Ozone Concentrations

Table 3 shows design values since the South Carolina 8-hour Ozone Attainment Demonstration for the York County nonattainment area was submitted on August 31, 2007. Values displayed in bold exceed the 1997 8-hour ozone NAAQS.

Table 3: 8-Hour Ozone Design Values (ppm) for Metrolina Nonattainment Area

Monitoring Sites	County	2005-2007	2006-2008	2007-2009
Crouse	Lincoln	0.083	0.082	0.076
Arrowood	Mecklenburg	0.083	0.079	0.076
County Line	Mecklenburg	**0.093**	**0.094**	**0.086**
Garinger (Plaza)	Mecklenburg	**0.090**	**0.089**	0.082
Enochville	Rowan	**0.090**	**0.088**	0.083
Rockwell	Rowan	**0.089**	**0.088**	0.083
Monroe	Union	0.081	0.080	0.076
York	York County, SC	0.079	0.077	0.072

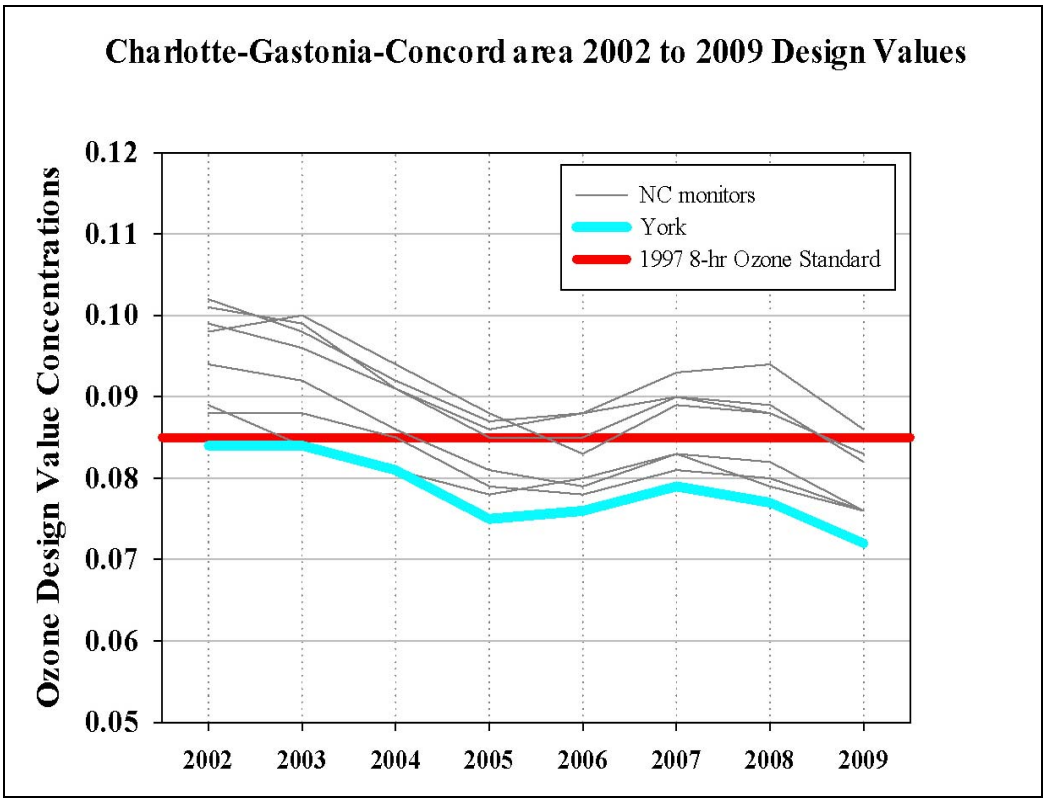

Figure 2: Design Values

Figure 2 shows design value trends since 2002. Note that the design value for the York monitor has remained below the 1997 8-hour ozone standard for the entire period shown.

IV. Additional Controls Applied

A. Metrolina Nonattainment Area Control Measures

There are no new controls planned for the York County nonattainment area for the 2010 ozone season.

EPA requested that SCDHEC include within its SIP the additional control measure information for the North Carolina portion of the Metrolina nonattainment area. The information in italics below was taken from the supplement prepared by NCDENR DAQ describing additional controls in the North Carolina portion of the Metrolina nonattainment area. Please refer to NCDENR's supplement submission for appendices referenced in this section. These appendices can be found at http://www.ncair.org/planning/CLTGastRHozoneredesig.shtml.

3.1 Emission Inventory and Controls Applied

There are five different emission inventory source classifications: stationary point and area sources, off-road and on-road mobile sources, and biogenic sources. Stationary point sources are those sources that emit greater than a specified tonnage per year and the data is provided at the facility level. Stationary area sources are those sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., dry cleaners, service stations, etc.). These types of emissions are estimated at the county level. Offroad mobile sources include equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from these sources, like stationary area sources, are estimated at the county level. On-road mobile sources are automobiles, trucks, and motorcycles that use the roadway system. The emissions from these sources are estimated by vehicle type and road type and are summed to the county level. Biogenic sources are the natural sources like trees, crops, grasses and natural decay of plants. The emissions from these sources are estimated at the grid cell level and summed to the county level.

A synopsis of the inventories used for each source classification and a summary of the controls applied are discussed below. The detailed discussions of the 2011 emissions inventory development can be found in Appendix C, and emission summaries by county for the Metrolina nonattainment area, as well as for the State, are in Appendix B.

3.1.1 Stationary Point Sources

Point source emissions are from individual sources having a fixed location. In general, these sources have a potential to emit more than five tons per year of carbon monoxide (CO), NOx, particulate matter (PM), sulfur dioxide and VOC from a single facility. These sources must have permits to operate and their emissions are inventoried on a regular schedule. Large sources having emissions of 100 tons per year (tpy) of a criteria pollutant, 10 tpy of a single hazardous air pollutant (HAP), or 25 tpy total HAP are inventoried annually. Smaller sources have been inventoried less frequently. The point source emissions data can be grouped into the electric generating units (EGU) sources and the other point sources, i.e., non-EGUs. Appendix C documents the 2011 point source modeling inventory development in more detail. Appendix B provides the average daily peak ozone season emissions in the Metrolina nonattainment area.

As part of the VISTAS [Southeast Regional Planning Organization, Visibility Improvement State and Tribal Association of the Southeast] *modeling, VISTAS and the Midwest Regional Planning Organization contracted with ICF Resources, L.L.C., to generate a future year emission inventory for the electric generating sector of the contiguous United States using the Integrated Planning Model (IPM). IPM is a dynamic linear optimization model that can be used to examine air pollution control policies for various pollutants throughout the contiguous United States for the entire electric power*

system. The dynamic nature of IPM enables the projection of the behavior of the power system over a specified future period. The optimization logic determines the least-cost means of meeting electric generation and capacity requirements while complying with specified constraints including air pollution regulations, transmission bottlenecks, and plant-specific operational constraints. The versatility of IPM allows users to specify which constraints to exercise and populate IPM with their own datasets.

The IPM modeling runs took into consideration the USEPA's Clean Air Interstate Rule (CAIR) implementation and North Carolina's Clean Smokestacks Act compliance plans for Duke Energy and Progress Energy. The VISTAS States then modified the IPM results to account for known controls expected to be installed, sources that were known to be shutting down that IPM had operating, and sources that IPM shutdown that the State knew would continue to operate.

The VISTAS 2012 EGU inventory was used as the starting point for the 2011 modeling inventory. This inventory was adjusted for 2011 based upon VISTAS States' feedback.

The general approach for assembling the 2012 VISTAS non-EGU point source inventory was to use recently updated growth and control data consistent with the USEPA's CAIR analyses. This data was supplemented with state specific growth factors and stakeholder input on growth assumptions. Based on state feedback, it was determined there would be very minimal differences between a 2012 and 2011 non-EGU emissions inventory. Therefore, the VISTAS 2012 non-EGU inventory was used for the 2011 modeling.

3.1.2 Stationary Area Sources

Stationary area sources include sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., combustion of fuels for heating, structure fires, service stations, etc.). Emissions are estimated by multiplying an emission factor by some known indicator of collective activity, such as fuel usage, number of households or population. Stationary area source emissions are estimated on the county level.

For categories other than wildland fires, the VISTAS/ASIP [Association of Southeastern Integrated Planning] *contractor generated the 2012 future year emissions inventory. Growth factors supplied from the states or the USEPA's CAIR emission projections were applied to project the controlled emissions. In some cases, the USEPA's Economic Growth and Analysis System Version 5 growth factors were used if no growth factor was available from either the states or the CAIR growth factor files. For wildland fires, the 2002 typical base year emissions were used. This is a common practice since it is difficult to predict where wildland fires will occur in the future.*

The 2012 VISTAS area source emissions inventory was used for the 2011 modeling since it was determined be a conservative estimate of emissions. Appendix C provides a detailed discussion of the area source inventory development. Appendix B provides emission summaries for average peak ozone season day.

3.1.3 Off-Road Mobile Sources

Off-road mobile sources, also referred to as non-road mobile sources, include equipment that can move but do not use the roadways, such as construction equipment, aircraft, railroad locomotives, lawn and garden equipment, etc. For the majority of the non-road mobile sources, the emissions were estimated using the USEPA's NONROAD2005c

model. For the three source categories not included in the NONROAD model, i.e., aircraft engines, railroad locomotives and commercial marine, more traditional methods of estimating the emissions were used.

The NONROAD model takes into consideration rules that are in effect that could impact the emissions from these source categories. For the four largest airports in North Carolina, the FAA's [Federal Aviation Administration's] *Terminal Area Forecast was used to project growth in aircraft emissions to 2011. For the commercial marine, railroad locomotives and the remaining airport emissions, the VISTAS/ASIP contractor calculated the 2012 emissions using detailed inventory data (both before and after controls) for 1996 and 2010 obtained from the USEPA's Clean Air Interstate Rule Technical Support Document. When available, state specific growth factors were used.*

For the 2011 modeling, an interpolated emissions inventory between the VISTAS 2009 and 2012 inventories was used. Appendix C provides a detailed discussion of the non-road mobile source inventory. Average daily emission summaries can be found in Appendix B.

3.1.4 Highway Mobile Sources

In order to accurately model the mobile source emissions in the Metrolina nonattainment area, the latest version of the MOBILE model available at the time of the modeling, MOBILE6.2, was used. Key inputs for the MOBILE model include information on the age of vehicles on the roads, the average speed on the roads, the mix of vehicles on the roads, any control technologies in place in an area to reduce emissions for motor vehicles (e.g., emissions inspection programs), and temperature. The MOBILE model inputs were developed through interagency consultation with the transportation partners for this area.

The MOBILE model takes into consideration rules that are in effect that impact the emissions from this source sector. The 2011 emissions inventory was developed running the MOBILE model using input data reflective of 2011. The 2011 vehicle miles traveled (VMT), speeds, vehicle age and vehicle mix data was obtained from the North Carolina Department of Transportation (NCDOT).

For a detailed discussion about the highway mobile source inventory development used in the 2011 modeling, please refer to Appendix C. Emission summaries by county for the highway mobile source sector can be found in Appendix B.

3.1.5 Biogenic Emission Sources

Biogenic emissions were prepared with the SMOKE [Sparse Matrix Operator Kernel Emissions] - *BEIS3 (Biogenic Emission Inventory System 3 version 0.9) preprocessor. SMOKE-BEIS3 is basically the Urban Airshed Model (UAM)-BEIS3 model, but also includes modifications to use MM5 data, gridded land use data, and science updates. The emission factors that are used in SMOKE-BEIS3 are the same as the emission factors in UAM-BEIS3.*

The basis for the gridded land use data used by BEIS3 is the county land use data in the Biogenic Emissions Landcover Database version 3 (BELD3) provided by the USEPA. A separate land classification scheme, based upon satellite (AVHRR, 1 km spatial resolution) and census information, aided in defining the forest, agriculture and urban portions of each county.

The 2002 base year biogenic emissions were used for 2011 modeling. This is a common practice in air quality modeling since the same meteorology is used and the biogenic emissions are very dependent on the meteorology. Variation in these emissions could impact the control strategies needed to demonstrate attainment. Therefore, these emissions are kept constant.

3.1.6 Controls Applied in 2011 Modeling

There are several State and Federal measures that have been enacted in recent years that are resulting in emissions reductions from stationary point sources, highway mobile sources and nonroad mobile sources. The Federal and State control measures modeled for 2011 are briefly discussed below. A more detailed description of these measures is in the June 2007 attainment demonstration SIP.

The federal measures that were modeled include:
• Tier 2 vehicle standards: In addition to NOx controls, the Tier 2 rule also reduced the sulfur content of gasoline to 30 ppm starting in January of 2006. Most gasoline sold in North Carolina prior to January 2006 had a sulfur content of about 300 ppm.
• Heavy-duty gasoline and diesel highway vehicle standards: Second phase of standards and testing procedures, which began in 2007, will reduce particulate matter from heavyduty highway engines, and will also reduce highway diesel fuel sulfur content to 15 ppm since the sulfur damages emission control devices. The total program is expected to achieve a 90% reduction in particulate matter (PM) emissions and a 95% reduction in NOx emissions.
• Nonroad spark-ignition engines and recreational engines standards: Tier 1 of this standard was implemented in 2004 and Tier 2 started in 2007, and will reduce NOx, Carbon Monoxide (CO), hydrocarbons and PM emissions.
• Large nonroad diesel engine standards: Promulgated in 2004, this rule is being phased in between 2008 and 2014. This rule will also reduce sulfur content in nonroad diesel fuel. When fully implemented, this rule will reduce NOx and direct PM2.5 emissions by over 90%.
• NOx SIP Call in surrounding states: In October 1998, the USEPA made a finding of significant contribution of NOx emissions from certain states and promulgated a rule that set ozone season NOx budgets for the purpose of reducing regional transport of ozone. This rule, referred to as the NOx SIP Call, required ozone season controls to be put on utility and industrial boilers, as well as internal combustion engines, in 22 states in the Eastern United States. A NOx trading program was established, allowing sources to buy credits to meet their NOx budget as opposed to actually installing controls. The emission budgets were to be met by the beginning of 2004.
• Clean Air Interstate Rule: On May 12, 2005, the USEPA promulgated the "Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NOX SIP Call", referred to as CAIR. This rule established the requirement for States to adopt rules limiting the emissions of NOx and sulfur dioxide (SO2). The purpose of the CAIR is to reduce interstate transport of precursors of fine particulate and ozone. Due to Court challenges of CAIR in 2008, the USEPA will be making changes to this program by 2011. However, the existing CAIR rules will remain in place until the USEPA promulgates changes to the program.

The state measures that were modeled include:
• Clean Air Bill: This State legislation expanded the inspection and maintenance (I/M) program from 9 counties to 48. Vehicles are tested using the onboard diagnostic system

(OBDII), an improved method of testing, which ensures proper emission system operation for vehicles and light trucks during their lifetime by monitoring emission-related components and systems for malfunction or deterioration. This program will reduce NOx and Volatile Organic Compound (VOCs), and Carbon Monoxide (CO).
• North Carolina NOx SIP Call rule: This rule was predicted to reduce summertime NOx emissions from power plants and other industries by 68%.
• North Carolina Clean Smokestack Act: This legislation requires coal-fired power plants in North Carolina to reduce annual NOx emissions by 77% by 2009 and to reduce annual sulfur dioxide emissions by 49% by 2009 and 73% by 2013. This legislation sets a cap on NOx and SO2 emissions, which the public utilities cannot meet by purchasing emission credits. The Clean Smokestacks Act reduces NOx emissions beyond the requirements of the NOx SIP Call rule since it requires year-round NOx controls and does not allow the purchase of credits to meet the NOx caps.
• Heavy duty diesel engine gap filling rule: This rule requires engine manufacturers to perform the supplemental testing requirements for heavy duty diesel engines for model years 2005 and 2006 due to delays in the USEPA's rule and will reduce NOx and PM emissions.

B. Federal Control Measures

Several federal control measures already in place or being implemented over the next few years will reduce stationary point, on-road, and non-road mobile sources emissions. Reductions from the federal control measures discussed below will impact emissions in 2009 and beyond, and were included in the modeling discussed in Section II and Appendix S-1.

1. Tier 2 Vehicle Standards

Federal Tier 2 vehicle standards will require all passenger vehicles in a manufacturer's fleet, including light-duty trucks and sport utility vehicles (SUVs), to meet an average standard of 0.07 grams of NO_X per mile. Implementation began in 2004, with full compliance required by 2007. The Tier 2 standards will also cover passenger vehicles over 8,500 pounds gross vehicle weight rating (the larger pickup trucks and SUVs), which are not covered by the current Tier 1 regulations. For these vehicles, the standards were phased in beginning in 2008, with full compliance in 2009. The new standards require vehicles to be 77 percent to 95 percent cleaner than those made prior to these dates. The Tier 2 rule also reduced the sulfur content of gasoline to 30 ppm starting in January of 2006. Most gasoline sold in South Carolina prior to January 2006 had a sulfur content of about 300 ppm. Sulfur occurs naturally in gasoline but interferes with the operation of catalytic converters on vehicles, resulting in higher NO_X emissions. Lower-sulfur gasoline is necessary to achieve the Tier 2 vehicle emission standards.

2. Heavy-Duty Gasoline and Diesel Highway Vehicles Standards

New USEPA standards designed to reduce NO_X and VOC emissions from heavy-duty gasoline and diesel highway vehicles commenced implementation in 2004. A second phase of standards and testing procedures, which began in 2007, is reducing particulate matter from heavy-duty highway engines and has reduced highway diesel fuel sulfur content to 15 ppm. The total program for these new engines using low sulfur diesel is expected to achieve a 90 percent reduction in particulate matter emissions and a 95 percent reduction in NO_X emissions (as compared to existing engines using higher-content sulfur diesel).

3. Large Non-Road Diesel Engines Rule

In May 2004, the USEPA promulgated new rules for large non-road diesel engines (such as those used in construction, agricultural, and industrial equipment) to be phased in between 2008 and 2014. The non-road diesel rules also reduce the allowable sulfur in non-road diesel fuel by over 99 percent. Non-road diesel fuel currently averages about 3,400 ppm sulfur. The rule limits non-road diesel sulfur content to 500 ppm in 2006 and 15 ppm in 2010. The combined engine and fuel rules would reduce NO_X and PM emissions from large non-road diesel engines by over 90 percent (as compared to current non-road engines using higher-content sulfur diesel).

4. Non-Road Spark-Ignition Engines and Recreational Engines Standard

The new standard, effective in July 2003, regulates NO_X, hydrocarbons (HC), and CO for groups of previously unregulated non-road engines. The new standard applies to all new engines imported into or sold within the United States, including: large spark-ignition engines (forklifts and airport ground service equipment), recreational vehicles (off-highway motorcycles and all-terrain-vehicles), and recreational marine diesel engines. The requirements vary based upon the type of engine or vehicle.

The large spark-ignition engines contribute to ozone formation and ambient CO and PM levels in urban areas. Tier 1 of this standard was implemented in 2004, and Tier 2 began in 2007. Like the large spark-ignition, recreational vehicles contribute to ozone formation and ambient CO and PM levels. For all model-year 2006 off-highway motorcycles and all-terrain-vehicles, the new exhaust emissions standard was phased-in at 50 percent. For model years 2007 and later, the standard was phased in at 100 percent. Recreational marine diesel engines over 37 kilowatts (used in yachts, cruisers, and other types of pleasure craft) contribute to ozone formation and PM levels, especially in marinas. For certain recreational marine diesel engine sizes, the standard began to be phased-in in 2006.

With all of the non-road spark-ignition engines and recreational engines standards fully implemented, overall reductions of 72 percent in HC, 80 percent in NO_X, and 56 percent in CO emissions are expected by 2020. These controls will help reduce ambient concentrations of ozone, CO, and fine PM.

5. Control of Emissions from Locomotives and Marine Diesel Engines

In March 2008, the USEPA promulgated a rule to control emissions from new locomotives and new marine diesel engines. The standards for remanufactured engines take effect as soon as certified remanufacture systems are available. Tier 3 standards reflect the application of currently available technologies and phase-in starting in 2009. Tier 4 standards are based on the application of high-efficiency catalytic aftertreatment technology and would phase-in beginning in 2014 for marine diesel engines and 2015 for locomotives.

The USEPA estimates this final rule will result in PM reductions of about 90 percent and NO_X reductions of about 80 percent from engines meeting these standards, compared to engines meeting the current standards. The proposed standards would also yield sizeable reductions in emissions of HC, CO, and other air toxics. The final rule will result in substantial benefits to public health and welfare and to the environment. The USEPA estimates that by 2030 this comprehensive emission control program will reduce annual emissions of NO_X by approximately 800,000 tons, and the magnitude of these reductions will continue to grow well beyond 2030.

6. Control of Emissions from Non-Road Spark Emission Engines and Equipment

In October 2008, the USEPA promulgated standards for new non-road spark-ignition engines. The exhaust emission standards apply starting in 2010 for new marine spark-ignition engines, and starting in 2011 and 2012 for different sizes of new land-based, spark-ignition engines at or below 19 kilowatts (kW), used primarily in lawn and garden applications. By 2030, this rule is projected to result in annual nationwide reductions of 132,200 tons of NO_X emissions. These reductions correspond to significant reductions in the formation of ground-level ozone. The USEPA estimates that by 2030, on an annual basis, these emission reductions will prevent between 77 and 350 ozone-related premature deaths.

7. Emission Standards Of Performance For Stationary Compression Ignition Internal Combustion Engines

Stationary compression ignition (CI) internal combustion engines (stationary diesel engines) are used at facilities such as power plants and chemical and manufacturing plants to generate electricity and power pumps and compressors, and in emergencies to produce electricity and pump water for flood and fire control. The proposed standards, known as New Source Performance Standards (NSPS), would limit emissions of NO_X and HC from stationary diesel internal combustion engines to the same stringent levels required by the USEPA's non-road diesel engine regulations. New, modified and reconstructed stationary diesel engines must comply with the proposed rule. Beginning in model year 2007, engine manufacturers were required to certify that all new, modified or reconstructed stationary diesel engines meet the stringent emissions levels that are required for the same size engine and model year non-road diesel engine. Beginning with 2011 model year engines, add-on controls will be required to achieve the emission limits for non-emergency Tier 4 engines. By 2015, the USEPA estimates that 81,500 new stationary diesel engines would be subject to the rule. The USEPA estimates that the total pollutant reductions will be over 68,000 tons per year in 2015. The proposed rule would reduce NO_X, PM, sulfur dioxide (SO_2), CO, and HC emissions gradually from 2005 to 2015, with overall reductions of 90 percent or more from baseline levels in some cases.

8. Final Emission Standards Of Performance For Stationary Spark Ignition Internal Combustion Engines; And Final Air Toxics Standards For Reciprocating Internal Combustion Engines

NSPS will limit emissions of NO_X, CO, and VOC from new stationary spark ignition internal combustion engines. Technology-based air toxics standards will limit air toxics emissions from new and reconstructed stationary reciprocating internal combustion engines that either are located at non-point sources, or that have a site rating of less than or equal to 500 horsepower. The USEPA plans to propose air-toxic standards for existing engines located at major and non-point sources in a separate regulatory action. For spark ignition engines, the USEPA estimates that the final rule will reduce NO_X emissions by 77,000 tons per year (tpy), CO emissions by about 45,000 tpy, VOC emissions by about 2,000 tpy, and air toxics emissions by approximately 800 tpy in the year 2015.

9. Clean Air Interstate Rule

On May 12, 2005, the USEPA promulgated the "Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_X SIP Call," referred to as CAIR. This rule established the requirement for

states to adopt rules limiting the emissions of NO_X and sulfur dioxide (SO_2) and established a model rule for the states to use in developing their rules. The purpose of CAIR is to reduce interstate transport of precursors to fine particulate and ozone. CAIR applies to: (1) any stationary; fossil-fuel-fired boiler or stationary, fossil-fuel-fired combustion turbine serving at any time, since the start-up of a unit's combustion chamber; a generator with nameplate capacity of more than 25 MWe producing electricity for sale; and (2) a unit that qualifies as a cogeneration unit during the 12-month period starting on the date that the unit first produces electricity and continues to qualify as a cogeneration unit and/or a cogeneration unit serving at any time a generator with nameplate capacity of more than 25 MWe and supplying in any calendar year more than one-third of the unit's potential electric output capacity or 219,000 MWh, whichever is greater, to any utility power distribution system for sale. This rule provide annual state caps for NO_X and SO_2 in two phases, with the Phase I caps for NO_X and SO_2 starting in 2009 and 2010, respectively. Phase II caps become effective in 2015. The USEPA is allowing the caps to be met through a cap and trade program if a state so chooses to participate in the program.

V. VOC Motor Vehicle Emission Budget

A 2009 volatile organic compound (VOC) Motor Vehicle Emission Budget (MVEB) was not necessary and/or included in the attainment demonstration that was originally submitted in 2007. Pursuant to 40 CFR 93.109(k), both the NCDAQ and SCDHEC determined that on-road mobile VOCs are insignificant contributors to ozone formation in the Metrolina nonattainment area. The EPA indicated by email on October 6, 2009, by phone on October 21, 2009 and again on December 9, 2009 that it will not accept the justification presented for VOC insignificance for the Metrolina nonattainment area; therefore, **the SCDHEC is submitting a VOC MVEB.** Discussion on VOC insignificance is also provided**.**

The MVEBs were developed using speeds and vehicle miles traveled for the York County nonattainment area generated by the Charlotte Department of Transportation, using the Metrolina Travel Demand model, and emission factors generated from the emissions model Mobile6.2.

Table 2 below shows the York County nonattainment area on-road mobile VOC emissions expressed in tons per day and the corresponding kilograms per day values for 2009.

Table 4: 2009 On-Road Mobile Source VOC Emissions for the York County Nonattainment Area

County	2009	
	Tons/day	Kg/day
York (partial)	4.563	4,141

Upon the EPA's affirmative adequacy finding for the York County nonattainment area VOC MVEB, as shown in Table 3 below, it will become the applicable VOC MVEB for the nonattainment portion of York County.

Table 5: York County Nonattainment Area VOC MVEB for 2009

County	MVEB (Kilograms/day)
York (partial)	4,141

The VOC MVEB has also been added to the narrative and Appendix F.3 of the attainment

demonstration document.

As stated above, SCDHEC believes that a VOC Insignificance for this area is supported and for purposes of transparency and providing information to the public, the following information summarizes our response to VOC insignificance for this area. Pursuant to 93.109(k), the York County nonattainment area meets the listed criteria as follows:

- The percentage of motor vehicle emissions in the context of the total SIP inventory. *On-road mobile emissions were projected to account for 9% of VOC emissions for 2009 in the attainment demonstration submitted in 2007. For 2011, on-road mobile emission sources were projected to account for 5% of VOC emissions. This is well within EPA's guideline of 10%, and continues to show a decreasing trend in the percentage of VOC emissions attributed to on-road mobile emissions. Further decreases beyond 2011 are expected due to fleet turnover and cleaner engine standards.*

- The current state of air quality as determined by monitoring data for the NAAQS. *As discussed above, the design value for the York monitor has remained below the 1997 8-hour ozone standard since 2002. In fact the design value has decreased 14 percent over that period. Annual values have decreased 18 percent since 2000. The annual value for the 2009 ozone season was 0.062 ppm. The 2009 design value is 0.072 ppm, well below the standard of 0.08 (effectively 0.084) ppm. (See Figures 1 and 2 on pages 3 and 4.)*

- The absence of SIP motor vehicle control measures. *No SIP vehicle control measures have been needed and none proposed for the York County nonattainment area.*

- Historical trends and future projections of the growth of motor vehicle emissions. *Appendix F.3 of the SIP submittal indicates that the State projects decreases in emissions, notwithstanding VMT. This assertion is supported by EPA's discussion of its approval of VOC insignificance for the Triangle Area of North Carolina (http://www.epa.gov/fedrgstr/EPA-AIR/2007/October/Day-03/a19513.htm.) In this Federal Register notice, EPA comments on North Carolina's documentation showing an anticipated increase of 25-30% in VMT for the Triangle Area, during which time on-road VOC emissions are expected to decline by 50%. Although the York County nonattainment area may be increasing in VMTs, the vehicle emissions are expected to decline similarly to the declines in the Triangle area.*

VI. NO_x Motor Vehicle Emissions Budget Adjustment

The NO_x MVEB that was originally submitted on August 31, 2007 has been adjusted to reflect the local roads being represented as local, per discussion with the interagency group. Local roads were represented as arterial in the August 31, 2007 submittal. The adjusted MVEB can be found in the *South Carolina 8-Hour Ozone Attainment Demonstration For the Portion of York County, South Carolina Within the Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO) Part of the Charlotte-Gastonia-Rock Hill, NC-SC 8-Hour Ozone Nonattainment Area.*