

US EPA ARCHIVE DOCUMENT

Charlotte-Rock Hill, NC-SC Area Designations for the 2008 Ozone National Ambient Air Quality Standards

The table below identifies the areas in North Carolina and South Carolina that EPA has designated as “nonattainment” for the 2008 ozone national ambient air quality standards (2008 ozone NAAQS) as part of the Charlotte-Rock Hill, NC-SC area. In accordance with section 107(d) of the Clean Air Act, EPA must designate an area (county or part of a county) “nonattainment” if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area. The technical analyses supporting the boundaries for this nonattainment area is provided below.

Table 1: Final Nonattainment Area for the Charlotte-Rock Hill, NC-SC Area

Area	State Recommended Nonattainment Counties	EPA’s Final Designated Nonattainment Counties
Charlotte-Rock Hill, NC-SC *	North Carolina: Cabarrus (partial)** Gaston (partial)** Iredell (partial)** Lincoln (partial)** Mecklenburg County Rowan (partial)** Union (partial)**	North Carolina: Cabarrus (partial)** Gaston (partial)** Iredell (partial)** Lincoln (partial)** Mecklenburg County Rowan (partial)** Union (partial)**
	South Carolina: None	South Carolina: York (partial) ¹

* Charlotte-Rock Hill, NC-SC is a multi-state nonattainment area.

** Recommended/designated along township boundaries. Specifically, North Carolina recommended that the nonattainment designations be defined as the following: **Cabarrus County (part)** - Central Cabarrus Township, Georgeville Township, Harrisburg Township, Kannapolis Township, Midland Township, Mount Pleasant Township, New Gilead Township, Odell Township, Poplar Tent Township, and Rimertown Township; **Gaston County (part)** - Crowders Mountain Township, Dallas Township, Gastonia Township, Riverbend Township, and South Point Township; **Iredell County (part)** - Davidson Township and Coddle Creek Township; **Lincoln County (part)** - Catawba Springs Township, Ironton Township, and Lincolnton Township; **Rowan County (part)** - Atwell Township, China Grove Township, Franklin Township, Litaker Township, Locke Township, Providence Township, Salisbury Township, Steele Township, and Unity Township; **Union County (part)** - Goose Creek Township, Marshville Township, Monroe Township, Sandy Ridge Township, and Vance Township.

EPA designated the remaining counties in North Carolina and South Carolina that are not listed in the table above as “unclassifiable/attainment” for the 2008 ozone NAAQS. In addition, the Indian country of the Catawba Indian Nation is being designated as a separate “unclassifiable/attainment” area for the 2008 ozone NAAQS.² The Catawba Indian Nation recommended designation of a separate

¹ Unless otherwise noted, throughout this document the reference to York County or a portion of York County is meant to exclude the consideration of Indian County associated with the Catawba Indian Nation.

² The Catawba Indian Nation Reservation is located within the South Carolina portion of the bi-state Charlotte nonattainment area. Generally air quality State Implementation Plans (SIPs) do not apply in Indian country throughout the United States. However, for purposes of the Catawba Indian Nation Reservation in Rock Hill, the South Carolina SIP does apply within the Reservation area of Indian country. Pursuant to the Catawba Indian Claims Settlement Act, S.C. Code Ann. 27-16-120, “all

unclassifiable/attainment area through their response to the EPA's 120-day letter which was released on December 9, 2011. More information about EPA's decision-making with respect to the Indian County associated with the Catawba Indian Nation can be found in "Appendix to the Charlotte-Rock Hill Technical Support Document – Catawba Indian Nation."

The analysis below provides the basis for the Charlotte-Rock Hill, NC-SC nonattainment area boundary. It relies on EPA's analysis of whether and which monitors are violating the 2008 ozone NAAQS, based on certified air quality monitoring data from 2009-2011, and an evaluation of whether nearby areas are contributing to such violations. EPA has evaluated contributions from nearby areas based on a weight of evidence analysis considering the factors identified below.

EPA issued guidance on December 4, 2008 that identified these factors as ones EPA would consider in determining nonattainment area boundaries and recommended that states consider these factors in making their designations recommendations to EPA.³

1. Air quality data (including the design value calculated for each Federal Reference Method or Federal Equivalent Method (FEM) monitors in the area);
2. Emissions and emissions-related data (including location of sources and population, amount of emissions and emissions controls, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography and topography (mountain ranges or other basin boundaries);
5. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Indian country, metropolitan planning organizations (MPOs))

Ground-level ozone generally is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Because NO_x and VOC emissions from a broad range of sources over a wide area typically contribute to violations of the ozone NAAQS, EPA believes it is important to consider whether there are contributing emissions from a broad geographic area. Accordingly, EPA chose to examine the 5 factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).⁴ All data and information used by EPA in this evaluation are the latest available to EPA.

In EPA's designations guidance for the 2008 ozone NAAQS, EPA recommended examining CSA/CBSAs because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in this technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. Congress required a similar approach in 1990 for areas classified as serious or above for the 1-hour ozone NAAQS and EPA used the same basic approach in the designation process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CSA or CBSA, EPA's guidance recommended using the boundary of the county containing the violating monitor as the starting point for considering the nonattainment area's boundary.

state and local environmental laws and regulations apply to the [Catawba Indian Nation] and Reservation and are fully enforceable by all relevant state and local agencies and authorities."

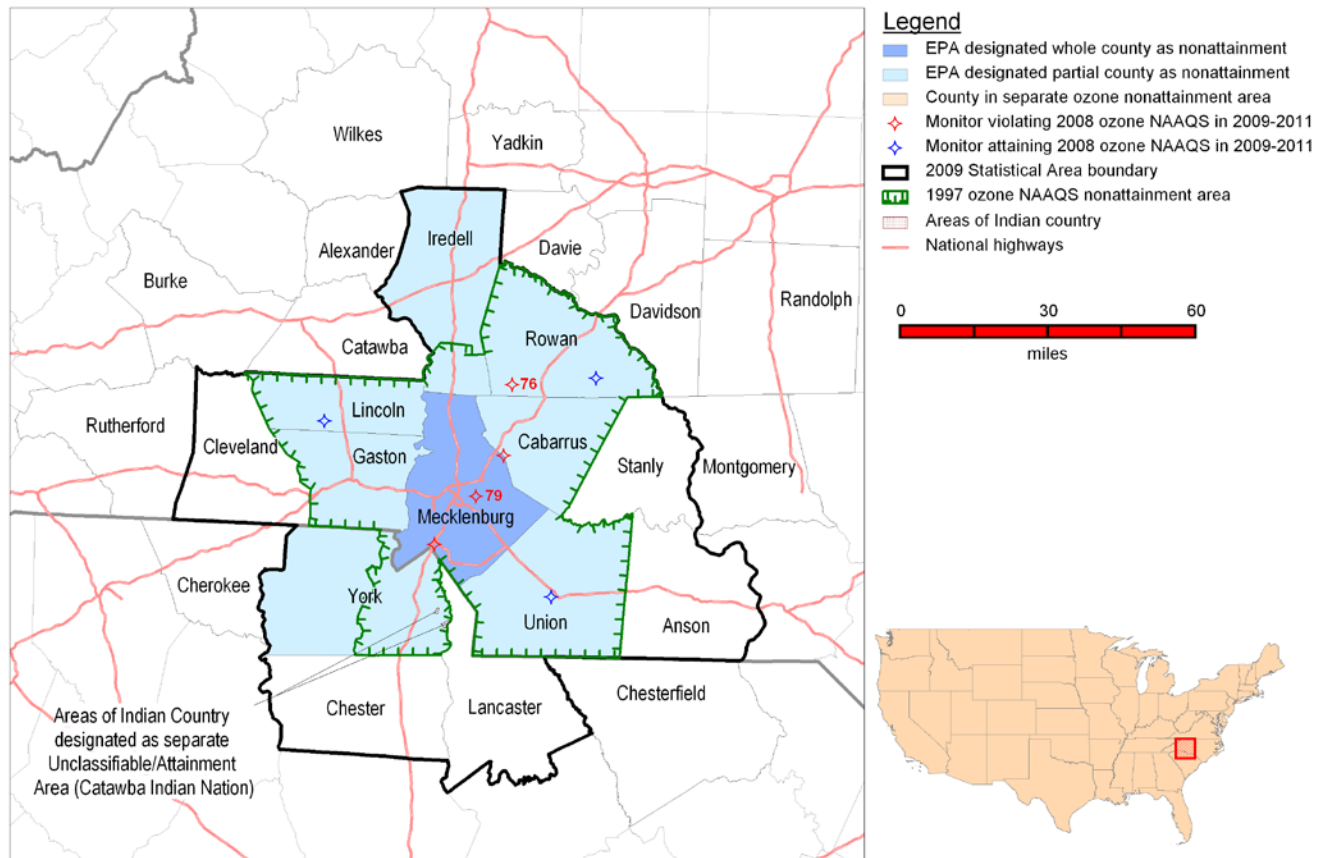
³ The December 4, 2008 guidance memorandum "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards" refers to 9 factors. In this technical support document we have grouped the emissions-related factors together under the heading of "Emissions and Emissions-Related Data," which results in 5 categories of factors.

⁴ Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The lists are periodically updated by the Office of Management and Budget. EPA used the most recent update, based on 2008 population estimates, issued on December 1, 2009 (OMB Bulletin No. 10-02).

Technical Analysis for Charlotte-Rock Hill, NC-SC

Figure 1 is a map of the Charlotte-Rock Hill, NC-SC nonattainment area. The map provides other relevant information including the locations and design values of air quality monitors, county and other jurisdictional boundaries, the CSA boundary, and national highways.

Charlotte-Rock Hill, NC-SC



For purposes of the 1997 8-hour ozone NAAQS, EPA designated the entire counties of Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union Counties, in their entireties, and a portion of Iredell County in North Carolina; and a portion of York County (including Indian Country), in South Carolina.

In March 2009, North Carolina recommended that the counties of Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union, and a portion of Iredell (Davidson and Coddle Creek Townships) be designated as “nonattainment” for the 2008 8-hour ozone NAAQS based on air quality data from 2006-2008. Additionally, in March 2009, South Carolina recommended that the portion of York County encompassed by the boundaries of the Rock Hill-Fort Mill Area Transportation Study (RFATS) MPO and the contiguous area encompassing the York ozone monitoring station (45-091-0006) be designated as “nonattainment” for the 2008 8-hour ozone NAAQS based on air quality data from 2006-2008. The Catawba Indian Nation did not submit a recommendation at that time.

In October 2011, North Carolina submitted an update to their 2009 recommendation and did not make revisions to their previous recommendation. Additionally, in October 2011, South Carolina submitted an amendment to their 2009 recommendation, and based on preliminary air quality data from 2009-

2011, revised their recommendation to “attainment” designations for each county in the State, including York County, for the 2008 8-hour ozone NAAQS. These data are from FEM monitors sited and operated in accordance with 40 CFR Part 58. (Letters from Dee Freeman, North Carolina Environmental Secretary to A. Stanley Meiburg, Acting Regional Administrator-EPA Region 4 and Gwendolyn Keyes Fleming, Regional Administrator-EPA Region 4 regarding the initial and updated nonattainment boundary recommendations for the 2008 8-hour ozone NAAQS for North Carolina (October 28, 2011 and March 12, 2009, respectively); Letter from Mark Sanford, South Carolina Governor to A. Stanley Meiburg, Acting Regional Administrator-EPA Region 4 regarding initial nonattainment boundary recommendations for the 2008 8-hour ozone NAAQS for South Carolina (March 12, 2009); Letter from Robert W. King, Jr., Deputy Commissioner of the South Carolina Environmental Quality Control to Gwendolyn Keyes Fleming, Regional Administrator-EPA Region 4 regarding updated nonattainment boundary recommendations for the 2008 8-hour ozone NAAQS for South Carolina (October 11, 2011)).

On December 9, 2011, EPA initiated the 120 day consultation process by notifying the States of North Carolina and South Carolina, and the Catawba Indian Nation that based on EPA’s technical analysis of the 13-county Charlotte-Gastonia-Salisbury CSA, EPA intended to designate six whole counties and one partial county in North Carolina; one partial county in South Carolina and Indian Country (associated with the Catawba Indian Nation) in South Carolina (identified in Table 2 below) as “nonattainment” for the 2008 ozone NAAQS as part of the Charlotte-Rock Hill, NC-SC nonattainment area. In this December 2011 letter, EPA also requested that if the States of North Carolina and South Carolina, and the Catawba Indian Nation wished to provide comments on EPA’s intended designation or to use early certified data for designation, they should provide comments or early certify by February 29, 2012.

Table 2. State's Recommended, Tribe’s Recommended and EPA’s Intended Designated Nonattainment Counties for Charlotte-Rock Hill, NC-SC from December 9, 2011

Charlotte-Rock Hill, NC-SC	State- or Tribe-Recommended Nonattainment Counties and Areas of Indian Country	EPA Intended Nonattainment Counties and Areas of Indian Country [^]
Catawba Indian Nation	None	<i>Catawba Indian Nation</i>
North Carolina	Cabarrus Gaston Iredell (partial) Lincoln Mecklenburg Rowan Union	<i>Cabarrus</i> <i>Gaston</i> Iredell (partial) <i>Lincoln</i> Mecklenburg <i>Rowan</i> <i>Union</i>
South Carolina	None	York (partial)

[^]***bold italics*** represent areas that were modified in the final boundary determination for the Charlotte-Rock Hill, NC-SC nonattainment area.

The Catawba Indian Nation, and the States of North Carolina and South Carolina all submitted additional information to support their designation and boundary recommendations. In summary, on February 29, 2012, the Catawba Indian Nation provided a recommendation of “attainment/unclassifiable” for the area of Indian country and submitted technical information to support the tribe’s recommendation of attainment. North Carolina provided certified 2009-2011 monitoring data, and revised its previous boundary recommendation to reduce the boundaries for the nonattainment

area from whole counties to partial counties for Cabarrus, Gaston, Lincoln, Rowan and Union counties. North Carolina's recommended boundary for Mecklenburg County, and a portion of Iredell County was consistent with its previous recommendation. North Carolina provided additional technical analysis to support this recommendation. The State of South Carolina provided recommendations based on certified 2009-2011 monitoring data, along with additional technical information, and maintained the State's recommendation that York County in its entirety be designated attainment.

EPA originally started with the CSA or CBSA areas for evaluating what areas violate and contribute to violations of the ozone NAAQS, and for final determinations refined its evaluation based on additional technical information provided by the states and tribes. After considering the recommendations and additional technical information for the Catawba Indian Nation, North Carolina, and South Carolina, and based on EPA's reevaluation of the eight counties and Indian Country as described below, EPA designated Mecklenburg County in its entirety and portions of Cabarrus, Gaston, Iredell, Lincoln, Rowan, and Union Counties in North Carolina, and a portion of York County (excluding the Indian Country associated with the Catawba Indian Nation) in South Carolina as "nonattainment" for the 2008 ozone NAAQS as part of the Charlotte-Rock Hill, NC-SC nonattainment area. More information about EPA's decision-making with respect to Indian Country associated with the Catawba Indian Nation can be found in "Appendix to the Charlotte-Rock Hill Technical Support Document – Catawba Indian Nation."

Factor Assessment

Factor 1: Air Quality Data

For this factor, EPA considered 8-hour ozone design values (in parts per billion (ppb)) for air quality monitors in counties in the Charlotte-Gastonia-Salisbury, NC-SC CSA, based on data for the 2009-2011 period (i.e., the 2011 design value), which are the most recent years with fully-certified air quality data. It should be noted that for EPA's December 9, 2011 technical analysis EPA only had certified monitoring data for the 2008-2010 period for the Charlotte-Gastonia-Salisbury, NC-SC CSA to consider. While the updated 2009-2011 monitoring data for the Area indicated a decline in levels overall from the 2008-2010 monitoring data, the 2009-2011 monitor data also indicated the violating monitors are in the same counties that contained violating monitors when EPA considered for the development of the preliminary boundary determination for the Charlotte-Rock Hill, NC-SC nonattainment area.

A monitor's design value is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years is 75 ppb or less. A design value is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the design value for the county or area is determined by the monitor with the highest level.

The 2011 design values for the ozone NAAQS for counties in the Charlotte-Gastonia-Salisbury, NC-SC CSA and nearby surrounding area are shown in Table 3. (Counties not identified do not have monitors.)

Table 3. Air Quality Data.^

County	State Recommended Nonattainment?	2009-2011 Design Value (ppb)
Mecklenburg, NC	Yes	79
Lincoln, NC	Yes	71
Rowan, NC	Yes	76
Union, NC	Yes	70
York, SC	No	64

^**Bolded** counties are those violating the 2008 ozone NAAQS.

Based on 2009-2011 monitoring data, Mecklenburg and Rowan Counties in North Carolina show violations of the 2008 ozone NAAQS, therefore Mecklenburg County, in its entirety, and a portion of Rowan County (including the area where the violating monitor is located) is included in the Charlotte-Rock Hill, NC-SC nonattainment area.

A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated, as discussed below, based on the five factors to determine whether it contributes to the nearby violation.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions of ozone precursors (i.e., NOx and VOC emissions) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

EPA evaluated county-level emission data for NOx and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. This is the most recently available NEI. (See <http://www.epa.gov/ttn/chief/net/2008inventory.html>) Significant emissions levels in a nearby area indicate the potential for the area to contribute to observed violations. EPA also considered any additional information the Agency received on changes to emissions levels that are not reflected in recent inventories.

As mentioned above, EPA received additional information from the States of North Carolina, South Carolina and the Catawba Indian Nation for the preliminary boundary determination for the Charlotte-Rock Hill, NC-SC nonattainment area, and this information was considered for this final designations. While more refined information was provided in some cases for meteorology (and is discussed below), and population and vehicle miles travelled (VMT) to account for a partial county emissions (also discussed below), no information was provided specifically to indicate that the overall emissions data used by EPA from the 2008 NEI was inaccurate. EPA notes that the Agency determined it was appropriate to consider full county emissions for Iredell County in North Carolina and York County in South Carolina for the EPA’s initial determination in December 2011 for consideration of these counties as part of the CSA in this Area because the CSA (and not the previous nonattainment boundary) was the Agency’s analytical starting point for the 2008 8-hour ozone designations. Iredell and York Counties in their entireties (i.e., not just the partial counties that are currently included in the 1997 8-hour ozone nonattainment area) are within the Charlotte-Gastonia-Salisbury CSA and thus were fully considered.

The precursor emission source-category percentages used below and throughout the document were derived from emissions data from the 2008 NEI version 1.5 referenced above. EPA considered the refined information for partial county emissions to determine the appropriateness of a partial county boundary for these and the other counties in the Charlotte-Gastonia-Salisbury CSA for the final designations. Table 4 shows emissions of NOx and VOC (given in tons per year (tpy)) for violating and nearby counties that EPA considered for inclusion in the Charlotte-Rock Hill, NC-SC area.

Table 4. Total 2008 NOx and VOC Emissions. ^

County	State Recommended Nonattainment?	NOx (tpy)	VOC (tpy)
Anson, NC	No	1,241	1,123
Cabarrus, NC	Yes	5,361	9,074
Chester, SC	No	2,652	1,780
Cleveland, NC	No	3,393	4,799
Gaston, NC	Yes	13,002	7,326
Iredell, NC	Yes (partial)	10,261	10,815
Lancaster, SC	No	1,626	2,744
Lincoln, NC	Yes	2,097	3,320
Mecklenburg, NC	Yes	27,275	33,412
Rowan, NC	Yes	7,117	9,834
Stanly, NC	No	1,935	2,986
Union, NC	Yes	5,190	7,748
York, SC	No	7,031	11,840
	Areawide:	88,179	106,802

^**Bolded** counties (or portions thereof) that are being included in the nonattainment area.

NOx Emissions: The Charlotte-Gastonia-Salisbury CSA profile reveals that mobile emissions comprise 55 percent of the total NOx in this Area, and that area sources comprise nine percent. The total of both mobile and area sources comprises 64 percent of the total NOx emissions in the Charlotte-Gastonia-Salisbury CSA. Mecklenburg, Gaston, Iredell, Rowan, and York Counties have the largest amounts of total NOx emissions in the CSA with 31 percent, 15 percent, 12 percent, and 8 percent (for both Rowan and York Counties each) respectively. The highest percentage of NOx emissions in the CSA come from mobile emissions. The percent mobile emissions from the following counties within the CSA are as follows: Mecklenburg County – 19 percent, Iredell County – 8 percent, Rowan County – 8 percent and

York County – 4 percent. For Gaston County, the highest percentage of NO_x emissions within the CSA is from point sources, with 9 percent of their total NO_x emissions.

VOC Emissions: The Charlotte-Gastonia-Salisbury CSA profile reveals that mobile emissions comprise 42 percent of the total VOC emissions in this Area, and that area sources comprise 38 percent for the total VOC emissions in the Charlotte-Gastonia-Salisbury CSA. The total of both mobile and area sources makes up 80 percent of the total VOC emissions in the Charlotte-Gastonia-Salisbury Area. EPA notes that while VOC emissions were considered in the analysis for the Area, EPA also acknowledges the study that was submitted by North Carolina during the 120-day consultation period that indicates that VOC emissions are not the primary driver for ozone formation in the Charlotte-Gastonia-Salisbury CSA. Mecklenburg, York, Iredell, Rowan, and Cabarrus Counties have the largest amounts of total VOC emissions in the CSA with 31 percent, 11 percent, 10 percent, 9 percent, and 8 percent, respectively. The highest percentage of VOC emissions within the CSA for Mecklenburg County is from area sources with 14 percent of their total VOC emissions. The highest percentage of VOC emissions within the CSA for Iredell, Cabarrus, and Rowan Counties is from mobile sources with 6 percent for Iredell County and 5 percent for both Cabarrus and Rowan Counties. Mecklenburg County's VOC emissions for mobile sources comprise 13 percent of the CSA. York County emissions are primarily from mobile and area sources.

North Carolina provided additional information showing that the townships in the portions of the following Counties: Cabarrus (i.e., Gold Hill Township); Gaston (Cherryville Township); Iredell (Barringer, Bethany, Chambersburg, Concord, Cool Springs, Eagle Mills, Fallstown, New Hope, Olin, Sharpesburg, Shiloh, Statesville, Turnersburg, and Union Grove Townships); Lincoln (Howards Creek and North Brook Townships); Rowan (Cleveland, Morgan, Mount Ulla, and Scotch Irish Townships) and Union (Buford, Jackson, Lanes Creek and New Salem Townships) did not contain point sources or contained point source emissions below 100 tpy for NO_x. The State also provided information that these same townships, with the exception of Cleveland Township, did not contain point sources or contained point source emissions below 100 tpy for VOC. Cleveland Township in Rowan County contains one point source that emits 211 tpy of VOC emissions.

Population density and degree of urbanization

EPA evaluated the population and vehicle use characteristics and trends of the Area as indicators of the probable location and magnitude of non-point source emissions. These include ozone precursor emissions from on-road and off-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to ozone formation. Rapid population or VMT growth (see below) in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to include the area associated with the area source and mobile source emissions as part of the nonattainment area. Table 5 shows the population, population density, and population growth information for Charlotte-Gastonia-Salisbury, NC-SC CSA that EPA considered for inclusion in the Charlotte-Rock Hill, NC-SC area.

Table 5. Population and Growth. ^

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Anson, NC	No	26,948	0.05	1,637	+6%
Cabarrus, NC	Yes	178,011	0.49	45,793	+35%
Chester, SC	No	33,140	0.06	(968)	-3%
Cleveland, NC	No	98,078	0.21	1,607	+2%
Gaston, NC	Yes	206,086	0.57	15,310	+8%
Iredell, NC	Yes (partial)	159,437	0.27	35,828	+29%
Lancaster, SC	No	76,652	0.14	15,259	+25%
Lincoln, NC	Yes	78,265	0.25	14,176	+22%
Mecklenburg, NC	Yes	919,628	1.67	218,914	+31%
Rowan, NC	Yes	138,428	0.26	7,753	+6%
Stanly, NC	No	60,585	0.15	2,339	+4%
Union, NC	Yes	201,292	0.31	75,733	+60%
York, SC	No	226,073	0.32	60,368	+36%
	Areawide:	2,402,623	0.36	493,749	+26%

^ **Bolded** counties (or portions thereof) that are being included in the nonattainment area.

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

(http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTP_L2.STO5&prodType=table)

Mecklenburg County has the largest population and is the most densely populated of all CSA counties with a population of 919,628 and 1,670 people/square mile. The population densities for Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Union and York Counties all are above 250 people/square mile. Additionally, the population growth for these same counties is 22 percent and above.

In response to EPA's December 9, 2011, preliminary determination for the nonattainment boundary in association with counties and tribal lands in the Charlotte-Gastonia-Salisbury CSA, North Carolina and South Carolina provided additional technical information to support a recommendation for a boundary that differed from EPA's December 9, 2011, preliminary determination. More discussion on this information and how EPA considered it for the final designation is discussed below.

In support of North Carolina's revised recommendations for EPA to consider partial county boundaries for Cabarrus, Gaston, Lincoln, Rowan and Union, the State provided additional information on population in these townships. The following summarizes the additional information that North Carolina provided.

- **Cabarrus County** - Based on the 2010 census, 178,011 people live in Cabarrus County, of which 176,580 live in the portion recommended by the State of North Carolina for

nonattainment. The western portion of the county is highly populated and centered around a large interstate corridor, while the eastern portion of the county is mostly rural. The Gold Hill Township recommended for attainment has a population density of 54 people per square mile. The population in Cabarrus County showed an increase between 2000 and 2010 of 34.7 percent. By comparison, population grew by 13 percent in Gold Hill Township. A county-wide increase of 23.4 percent is expected between 2010 and 2020.

- **Gaston County** - There are 206,086 people who live in Gaston County, and 189,586 people live in the five townships recommended as nonattainment, which is 92 percent of the County's population. The majority of the townships in Gaston County have population densities greater than 300 people per square mile or higher, with Gastonia being the highest at over 1200 people per square mile. The Cherryville Township has the lowest population density of any Gaston County townships, at 253 people per square mile. The population in Gaston County grew approximately 8.26 percent from 2000 to 2010, and an additional growth of 17.2 percent is expected between 2010 and 2020. The majority of this growth occurred in the eastern two-thirds of the county, with the largest increases observed in Riverbend and South Point Townships, which border Mecklenburg County. Cherryville Township's population increased by only 776 people, which corresponds to a 5.2 percent increase in the township's population density.
- **Iredell County** - There are 159,437 people who live in Iredell County, and 65,385 people live in the two townships designated as nonattainment, which is 41 percent of the County's population. The northern, eastern and western portions of Iredell County have population density in the 11 townships of 250 people per square mile or less. Statesville, located in central Iredell County, has a population density of 814 people per square mile. The area recommended for nonattainment, the two townships in the southern portion of Iredell County, is densely populated, having population density values of 860 and 714 people per square mile. The population in Iredell County grew considerably from 2000 to 2010, increasing by 30 percent, and an additional growth of 17.2 percent is expected between 2010 and 2020. The majority of this growth occurred in the two southern townships recommended for nonattainment. Davidson Township's population growth was 90 percent and Coddle Creek Township's growth was 43 percent. Population growth in all other townships in Iredell County was less than 40 percent with most being less than 20 percent.
- **Lincoln County** - Based on the 2010 census, 78,265 people live in Lincoln County and 63,437 people live in the three townships recommended as nonattainment, which is 81 percent of the County's population. The eastern three townships within Lincoln County, where Lincolnton and Catawba Springs are located, are densely populated, with population values of 468,286, and 347 people per square mile. This more densely populated area is located in the three eastern townships recommended for nonattainment. The western two townships have population densities of 112 and 137 people per square mile. The population in Lincoln County grew considerably from 2000 to 2010, increasing by 22 percent, and an additional growth of 20 percent is expected between 2010 and 2020. The majority of this growth occurred in the eastern half of the county. The population of the eastern-most township, Catawba Springs, increased by nearly 7,700 people from 2000 to 2010, which corresponds to an increase in population density of over 53 percent. Conversely, the two townships recommended for attainment by the State (i.e., Howards Creek and North Brook Townships) only grew by 1,313 and 665 people, respectively, from 2000 to 2010; this corresponds to a respective increase in population density of 17 percent and 13.1 percent for these two townships.
- **Rowan County** - Based on the 2010 census, 138,428 people live in Rowan County, of which 128,675 live in the portion recommended for nonattainment. The far northwestern and far eastern townships in the county are mostly rural with population densities less than 100 people per square mile. Conversely, the areas recommended for nonattainment in general have a

significantly higher population density and are more urban in nature. The four townships recommended to be designated attainment by the State have population density ranging from 52 to 98 people per square mile. The population in Rowan County increased slightly between 2000 and 2010 (5.9 percent). The townships recommended for attainment showed a combined population growth of 466 people during this time. Of these, Mount Ulla Township had the highest growth - 295 people, corresponding to an increase in population density of 21 percent. Cleveland and Scotch Irish Townships increased 4 percent in population density, while Morgan Township actually decreased slightly in population. The population of Rowan County is projected to grow only 6.5 percent between 2010 and 2020.

- **Union County** - There are 201,292 people who live in Union County as 2010, of which 173,775 people live in the portion recommended for nonattainment by the State. The eastern and southern portion of the county is mostly rural; all four townships that North Carolina recommended to be designated attainment have population densities of 189 people per square mile or less. The area recommended for nonattainment is more urbanized with three of the six townships having a population density of greater than 500 people per square mile. The population in Union County showed a significant increase between 2000 and 2010, with an increase of 60.5 percent. Most of the increases were focused over the townships of Monroe, Vance, Goose Creek and Sandy Ridge. Vance Township's population increased by 27,237 people from 2000 to 2010, corresponding to a 109 percent increase in population density. Sandy Ridge Township increased in population by 29,245, a 181 percent increase in population density. The townships recommended for attainment by the State collectively increased by 5,144 people during this time. A county-wide increase in population of 26 percent is expected between 2010 and 2020.

In support of South Carolina's recommendation that York County, in its entirety, be designated attainment for the 2008 8-hour ozone NAAQS, South Carolina provided additional information regarding the population in the portion of York County that EPA included in the Agency's December 9, 2011 boundary determination for the counties and tribal lands in association Charlotte-Gastonia-Salisbury CSA. EPA notes that while South Carolina's additional technical information is provided for only the portion of York County that Agency is considering for nonattainment, that the Agency's analytical starting point, as described in EPA's December 2004 boundary guidance, is the entire CSA which includes York County in its entirety. EPA does not agree that the Agency's use of the full county information for York County is a misrepresentation. To the contrary, EPA believes that use of full county information is consistent with the approach outlined in EPA's December 2008 boundary guidance of considering all of the counties in a CSA/CBSA. Utilizing full county information, the absolute change in population from 2000 to 2010 in York County is calculated as 60,368. The population percent change is calculated as 36 percent change. This percentage presents the second largest percent growth over the ten year period of 2000-2010 within the CSA and demonstrates York County cannot be excluded from consideration of contribution to violations at monitors in the Charlotte-Gastonia-Salisbury CSA.

EPA considered the more refined partial county information for the final determination on whether or not a partial county boundary for York County is appropriate. As noted by South Carolina, while the population for York County, in its entirety for 2010 of 226, 273 people, the portion of York County that EPA is considering for nonattainment has a majority of the County's population at 173,881 people which is approximately 80 percent of the population in York County.

Traffic and commuting patterns

EPA evaluated the total VMT for each county in the area. In combination with the population/population density data and the location of main transportation arteries (see above), this information helps identify the probable location of non-point source emissions. A county with high VMT is generally an integral part of an urban area and indicates the presence of motor vehicle emissions that may contribute to ozone formation that contributes to nonattainment in the area. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that the associated area source and mobile source emissions may be appropriate to include in the Charlotte-Rock Hill, NC-SC nonattainment area. Table 6 shows traffic data, including total 2008 VMT data.

Table 6. Traffic and Commuting Patterns.^

County	State Recommended Nonattainment?	2008 VMT (million miles)
Anson, NC	No	287
Cabarrus, NC	Yes	1,982
Chester, SC	No	562
Cleveland, NC	No	1,230
Gaston, NC	Yes	2,347
Iredell, NC	Yes (partial)	2,558
Lancaster, SC	No	656
Lincoln, NC	Yes	805
Mecklenburg, NC	Yes	11,315
Rowan, NC	Yes	1,816
Stanly, NC	No	605
Union, NC	Yes	1,791
York, SC	No	2,002
	Areawide:	27,956

^**Bolded** counties (or portions thereof) that are being included in the nonattainment area.

**** MOBILE model VMT are those inputs into the NEI version 1.5.

Consistent with EPA's 2008 boundary guidance, the Agency considered VMT, traffic and commuting from all of the counties in the CSA/CBSA for areas as the analytical starting point for the determination of a boundary for a nonattainment area. For this initial analysis, EPA did not assume or predetermine a partial county boundary for any particular county that was within the CSA. Utilizing full county information, Cabarrus, Gaston, Iredell, Mecklenburg, Rowan, Union, and York Counties VMT are the highest where each county have VMT greater than 1,790 million miles. These traffic data support a further consideration of inclusion of Cabarrus, Gaston, Iredell, Mecklenburg, Rowan, Union, and York Counties, or portions thereof, for the Charlotte-Rock Hill, NC-SC nonattainment area.

North Carolina's February 29, 2012, submission provided additional information on traffic and commuting in the Charlotte-Gastonia-Salisbury CSA, and in particular for the townships for which the

State requested exclusion from the final nonattainment area. The information provided by North Carolina is summarized below.

- Cabarrus County has 5.7 million daily VMT, according to 2010 data. Cabarrus County contributes 5.17 percent of the commuters who drive in to Mecklenburg County to work each day, most of which live in the western portion of the county. Cabarrus County ranks number 2 in commuting counties into Mecklenburg County. The VMT are expected to increase to 6.5 million by 2015 and 8.1 million by 2025. Traffic and commuting counts for Gold Hill Township are 0.3 percent of the county-wide total of commuters traveling into Mecklenburg County.
- Gaston County has 5.7 million average daily VMT, according to 2010 data. Gaston County contributes 4.97 percent of the commuters who drive into Mecklenburg County to work each day. Gaston ranks number 4 in the commuting counties into Mecklenburg. The VMT are expected to increase to approximately 7.5 million by 2015 and 9.1 million by 2025. For Cherryville Township, there were approximately 800 trips to/from Mecklenburg County, which was under 3 percent of the County total and less than 0.2 percent of trips to/from Mecklenburg County in the entire CSA.
- Iredell County has 5.7 million average daily VMT, according to 2010 data. Iredell County contributes 1.91 percent of the commuters who drive into Mecklenburg County to work each day. Iredell County ranks number 5 in the commuting counties into Mecklenburg County. The VMT are expected to increase to approximately 7.3 million by 2020. Traffic counts are highest in the southern townships and decline substantially in the next tier of townships. The southern two townships are covered by the region's Travel Demand Model, which predicts that the VMT will be 3.4 million by 2015, and 4.1 million in 2025.
- Lincoln County has 2.3 million average daily VMT, according to 2010 data. Lincoln County contributes approximately 1.49 percent of the commuters who drive into Mecklenburg County to work each day. Lincoln County ranks number 6 in the commuting counties into Mecklenburg County. The VMT are expected to increase to approximately 2.7 million by 2015 and 3.4 million by 2025. A significant amount of commuter traffic from the three eastern townships travels into Mecklenburg County. Therefore, the eastern townships may be impacting the ambient air quality data in this CSA and North Carolina recommends the three eastern townships be designated nonattainment. Commuter traffic into Mecklenburg County from the two western townships was an estimated 230 trips, which was less than 3 percent of the county total and less than 0.4 percent of the CSA total.
- Rowan County has 5.3 million daily VMT, according to 2010 data. Rowan County contributes 0.96 percent of the commuters who drive in to Mecklenburg County to work each day, most of which live in the central and south-central portions of the county. Rowan County ranks number 8 in commuting counties into Mecklenburg County. The VMT is expected to increase to 5.7 million by 2015 and 6.9 million in 2025. The far northwestern and far eastern townships in the county have very low traffic counts and would have little impact on ozone concentrations in the CSA. Morgan, Mount Ulla and Scotch Irish Townships collectively account for approximately 98 trips to Mecklenburg County, which represents about 2 percent of the total from Rowan County and 0.02 percent from the entire CSA.
- Union County has 5.2 million daily VMT, according to 2010 data. Union County contributes 6.84 percent of the commuters who drive in to Mecklenburg County to work each day, most of which live in the western portion of the County. Union County ranks number 1 in commuting counties into Mecklenburg County. The VMT are expected to increase to 6.5 million in 2015 and 8.7 million in 2025. There is a significant amount of commuter traffic from the northern and western townships into Mecklenburg County. These townships (Monroe, Sandy Ridge, Vance and Goose Creek Townships) may be impacting the ambient air quality data in the CSA. The 4

townships recommended for attainment have lower traffic counts compared to the 5 townships that are recommended for nonattainment. Of the 4 townships recommended to be excluded by the State, Jackson Township had an estimated 1563 trips to/from Mecklenburg County, which was 4.1 percent of the county total and 0.3 percent of the trips from the entire CSA. Traffic to/from Mecklenburg County for the 3 other townships (Buford, Lanes Creek, and New Salem Townships) was even less.

To support its recommendation of attainment for York County, in its entirety, South Carolina provided partial county VMT for the portion of York County that is currently in the 1997 8-hour ozone Charlotte nonattainment area. Specifically, South Carolina provided additional information in their February 29, 2012, submission related to the portion of York County along the Rock Hill – Fort Mills Area Transportation Study (RFATS) boundary. RFATS is the MPO for the Rock Hill area. EPA notes again that the analytical starting point that was considered by the Agency (as consistent with EPA's 2008 boundary guidance) was the entire area that is located in the Charlotte-Gastonia-Salisbury CSA, which is York County in its entirety. Utilizing full county information, York County's VMT is the fourth highest for the Charlotte-Gastonia-Salisbury CSA at 2,002 million miles. As mentioned above, EPA is considering the refined partial county data provided by the State to make a determination on whether or not a partial county boundary (as opposed to a whole county boundary) for York County is appropriate.

South Carolina used applied 2010 partial county annual average daily VMT (AADVMT) and the whole county York County AADVMT to determine that 82.6 percent of the York County VMT was attributed to the partial county portion of the 2009 model run for the Charlotte Area. Using this ratio, the VMTs for the partial county in York County was calculated as 1,653 million miles. EPA reviewed the most recent data submitted in South Carolina's May 31, 2011, Redesignation Demonstration and Maintenance Plan which utilizes a ratio of 75.8 percent of the total York County 2010 VMTs as the portion of York County which EPA is designating as nonattainment. EPA used the Annual Average Weekday Vehicles Miles Travelled HPMS tool,⁵ a motor vehicle emission simulator converter tool, to calculate the AADVMT for this portion of York County. EPA's calculation is 1,953 million miles. Regardless of what data set is used for the partial county information, it appears that a majority of the VMT from York County is from the portion of the County that is being included in the Charlotte-Rock Hill, NC-SC nonattainment area, and thus a partial county boundary could be appropriate for this Area.

⁵ EPA's converter tool can be found on the EPA website at: <http://www.epa.gov/otaq/models/moves/tools.htm>.

Factor 3: Meteorology (weather/transport patterns)

For this factor, EPA analyzed 30-years of National Weather Service (NWS) wind speed and wind direction data collected at the Charlotte/Douglas International Airport (NWS Station 13881) to help determine transport patterns and source contributions. EPA assessed wind direction and speed for the 2009-2011 “ozone season” (April through October) in the Charlotte CSA. These analyses were conducted to better understand the fate and transport of precursor emissions contributing to ozone formation. EPA’s analysis of the NWS data indicate predominate winds blowing from the south, southwest, and north for the Charlotte CSA.

The counties of Rowan and Mecklenburg in the CSA have violating monitors with design values at or greater than 76 ppb. The prevailing winds during the 2009-2011 ozone seasons have a strong southwesterly component, suggesting that the part of York County that includes the majority of the population and commuting traffic (which is southwest of the violating monitors) should be included in the nonattainment area. Lincoln and Gaston Counties are also southwest and west-southwest and may contribute to the violating monitors in Rowan County. Prevailing winds during the ozone season also have strong north and south components which suggests that Union, Cabarrus and Iredell Counties may contribute to the violating monitors in Mecklenburg and Rowan Counties.

North Carolina provided detailed information in Appendix I of their response to EPA’s 120 Day letter, presenting wind back trajectories and wind roses for the Charlotte Area. North Carolina used National Oceanic and Atmospheric Administration’s (NOAA) Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPPLIT) model to develop the back trajectories for all monitors on all days with ozone concentrations at or above 76 ppb within the Charlotte-Gastonia-Salisbury CSA. The information provided is consistent with EPA’s assessment of the entire area as discussed above.

South Carolina also provided a detailed meteorological data analysis, including a thorough back trajectory analysis developed with NOAA’s HYSPLIT model for each of the ozone monitors in the Charlotte-Gastonia-Salisbury CSA during episodes when the monitors measured exceedances of the ozone standard (see Appendix A of South Carolina’s February 29, 2012 response). EPA agrees with South Carolina’s assertion that many of the back trajectories show air masses passing over Charlotte on ozone exceedance days. However, some of the back trajectories also pass over York County indicating the potential for York county emissions to contribute to ozone exceedances during these specific events (e.g., June 8, 2011). Recirculation of emissions from other areas and elevated “aged ozone” from stagnation conditions may contribute to the ozone exceedances during these events, but nothing provided by South Carolina conclusively precludes transport of emissions from York County. Therefore, York County cannot be ruled out as a potential contributor to ozone violations at monitors in the Charlotte-Gastonia-Salisbury CSA.

Factor 4: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

The Charlotte-Gastonia-Salisbury, NC-SC CSA does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a significant role in this evaluation.

Factor 5: Jurisdictional boundaries

Once EPA identified the general areas that the Agency anticipated would be included in the nonattainment area, EPA then considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary and to help identify the areas appropriate for carrying out the air quality planning and enforcement functions for nonattainment areas. Examples of jurisdictional boundaries include existing/prior nonattainment area boundaries for ozone or other urban-scale pollutants, county lines, air district boundaries, township boundaries, area covered by an MPO, state lines, Areas of Indian Country, and urban growth boundary. Where existing jurisdictional boundaries were not adequate or appropriate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates were considered.

The Charlotte area has previously established nonattainment boundaries associated with both the 1-hour ozone and 1997 8-hour ozone NAAQS. The Charlotte nonattainment boundary for the 1-hour ozone NAAQS included Mecklenburg County, North Carolina in its entirety. Whereas the Charlotte nonattainment boundary for the 1997 8-hour ozone NAAQS included Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan and Union Counties in North Carolina in their entireties, a portion of Iredell County, North Carolina, a portion of York County, South Carolina, and Indian Country associated with the Catawba Indian Nation. The States have recommended a different boundary for the 2008 ozone NAAQS. Additionally, the Catawba Indian Nation recommended designation of a separate unclassifiable/attainment area through their response to the EPA's 120-day letter which was released on December 9, 2011. More information about EPA's decision-making with respect to the Indian Country associated with the Catawba Indian Nation can be found in "Appendix to the Charlotte-Rock Hill Technical Support Document – Catawba Indian Nation." In South Carolina's October 2011 letter, they revised their boundary recommendations to attainment statewide as a result of the most current air quality data which indicates attainment of the 2008 8-hour ozone standard. The presence of a violating monitor is not the only factor considered in nonattainment boundaries. However, a consideration of the other factors was not presented in their October 2011 letter.

Conclusion

Based on the assessment of factors described above and throughout this technical support document, EPA has concluded that the following counties should be included as part of the Charlotte-Rock Hill, NC-SC nonattainment area because they are either violating the 2008 ozone NAAQS or contributing to a violation in a nearby area: Mecklenburg County in its entirety and portions of Cabarrus, Gaston, Iredell, Lincoln, Rowan and Union Counties in North Carolina, and a portion of York County, South Carolina. All of these counties, or portions thereof, are included in the Charlotte nonattainment area for the 1997 ozone NAAQS. The air quality monitors in Mecklenburg and Rowan Counties, North Carolina are currently violating the 2008 ozone NAAQS based on 2011 design values, therefore these counties (or portions thereof) are included in the nonattainment area. Portions of Cabarrus, Gaston, Iredell, Lincoln, and Union Counties in North Carolina and a portion of York County, South Carolina are nearby counties that do not have violating monitors or do not contain monitors, but EPA has concluded that these areas contribute to the ozone concentrations in violation of the 2008 ozone NAAQS through emissions from mobile and area sources. Gaston, Iredell, Mecklenburg, Rowan, and York Counties have the highest NO_x emissions in the area. Cabarrus, Iredell, Mecklenburg, Rowan, and York Counties have among the highest VOC emissions in the area. Lincoln, Union, and York Counties ranked relatively high for emissions-related data such as population, and population density; commuting; meteorology, and jurisdictional boundaries.

Appendix to the Charlotte-Rock Hill, NC-SC Technical Support Document – Catawba Indian Nation

The Catawba Indian Nation Reservation, which consists of two tracts of land within York County, South Carolina, is being designated for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) as a separate “unclassifiable/attainment” area from the surrounding Charlotte-Rock Hill, NC-SC nonattainment area (Charlotte Area). The Catawba Indian Nation recommended designation of its Reservation as a separate unclassifiable/attainment area through the Tribe’s February 29, 2012, response to the EPA’s proposed designation for the Charlotte Area (120-day letter).

In March 2009, and in October 2011, prior to EPA’s 120-day letters, North Carolina and South Carolina made recommendations for their respective portions of the Charlotte Area. The Catawba Indian Nation did not submit a recommendation at either time. On December 9, 2011, the EPA initiated the 120-day consultation process by notifying the States of North Carolina and South Carolina, and the Catawba Indian Nation that, based on the EPA’s technical analysis of the 13-county Charlotte-Gastonia-Salisbury combined statistical area (CSA), EPA intended to designate six whole counties and one partial county in North Carolina; one partial county in South Carolina; and the Catawba Indian Nation Reservation as “nonattainment” for the 2008 Ozone NAAQS as part of the Charlotte Area. In this December 2011 letter, the EPA also requested that if North Carolina or South Carolina, or the Catawba Indian Nation wished to provide comments on the EPA’s intended designation, it should do so by February 29, 2012.

The Catawba Indian Nation, North Carolina, and South Carolina each submitted comments on the EPA’s proposed designations and provided additional information to support their designation and boundary recommendations. On February 29, 2012, the Catawba Indian Nation provided its recommendation of “attainment/unclassifiable” for the Tribe’s Reservation and submitted technical information to support its recommendation of attainment.

Section 107(d)(1) of the Clean Air Act requires that the EPA designate an area nonattainment if it violates a NAAQS or contributes to a violation of the NAAQS in a nearby area. The EPA’s December 20, 2011, Policy for Establishing Separate Air Quality Designations for Areas of Indian Country, provides a process whereby an analysis of the factors described below may be used to determine whether an area of Indian Country located within or next to a larger multi-jurisdictional area should be excluded from that area and potentially designated separately or whether it should be designated according to the rest of the area. Provided below is a summation of the information relied upon by the EPA to designate the Catawba Indian Reservation as attainment/unclassifiable for purposes of the 2008 Ozone NAAQS, separate from the Charlotte-Rock Hill, NC-SC Area.

Factor Assessment

Factor 1: Air Quality Data

The air quality data analysis for Tribal areas evaluates the data pertaining to air quality in the relevant area of Indian country. Where such data is unavailable or incomplete, the analysis also involves consideration of other available information that may enable the Agency to characterize air quality in the area.

There are no monitors within the Catawba Indian Nation Reservation. The sole monitor in York County, located approximately 16 to 18 miles west of the Reservation, is attaining the 2008 Ozone NAAQS based upon the 2009-2011 period (i.e., the “2011 design value,” which represents the most recent years with fully-certified air quality data).⁶ Consequently, the EPA’s designation analysis for this Reservation is based upon whether sources are contributing to the violating monitors in the Charlotte-Gastonia-Salisbury CSA. Based on data provided by North Carolina, South Carolina and the Catawba Indian Nation, there is no indication that the air quality on the Catawba Indian Nation Reservation is violating the 2008 Ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions of ozone precursors (i.e., NO_x and VOC emissions) and other emissions-related data to determine whether sources on the Catawba Indian Nation Reservation are contributing to violations. This analysis is comprised of three general considerations: population density and degree of urbanization; traffic and commuting patterns; and, source emissions data. Each of these considerations, as applicable to the Catawba Indian Reservation, is summarized below.

Population density and degree of urbanization

As described above, the Catawba Indian Nation Reservation is located within York County, South Carolina. The Tribe included information in its technical support document to distinguish the Reservation from the York County, South Carolina area that is being designated nonattainment as part of the Charlotte-Rock Hill, NC-SC area. In the Catawba Indian Nation’s February 29, 2012, letter, the Tribe provided information to demonstrate that the prevailing population density and degree of urbanization within the Reservation is not consistent with the portion of York County proposed by the EPA for inclusion in the Charlotte Area. The Tribe explained that while the Reservation is within York County, it is outside of the urban cluster of Rock Hill, and is less densely populated - and is more rural in character - than the York County portion of the CSA. The Tribe further explained that the Catawba Indian Nation consists of two tracts of land along the Catawba River with a total land base of approximately 1,000 acres, which comprises only 0.002 percent of the land area of York County and 0.004 percent of the land area in the portion of York County that is being considered for nonattainment for the 2008 ozone NAAQS. The Tribal members living on the Reservation comprise only about 0.003 percent of the population of York County and exhibit close to zero percent population growth. The most recent demographic data for the Catawba Indian Nation indicates that the population consists of 586 Tribal members living in 312 homes within the Catawba Indian Nation Reservation.

Traffic and commuting patterns

According to information provided by the Catawba Indian Nation, of the 586 members of the Tribe, only 340 are of working age. In addition, the unemployment rate is relatively high and many adults have limited or no access to transportation (the Tribe operates a public transit program for those members who do not have transportation). Of the Tribal members that are children, 90 percent of them travel to school by bus and 10 percent by car.

⁶ A monitor’s design value is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years is 75 ppb or less. A design value is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the design value for the county or area is determined by the monitor with the highest recorded level of ozone.

Source Emissions Data

There are currently no point sources of ozone precursors within the boundaries of the Catawba Indian Nation Reservation. York County, South Carolina does contain a number of major sources for NO_x and VOC, however, these sources are all located at least two miles from the Reservation. Therefore, there is no indication that sources on the Catawba Indian Nation Reservation are contributing to violations in the surrounding state area

Factor 3: Meteorology (weather/transport patterns)

The meteorology analysis evaluates how weather and transport patterns of the area affect the fate and transport of emissions from sources on or nearby the relevant area of Indian country. The meteorological conditions on the Reservation are not distinguishable from that of the surrounding portions of York County, South Carolina. In response to the EPA's proposed designation for Charlotte Area (120-day letter), both North Carolina and South Carolina provided thorough analyses of the wind and transport patterns affecting the violating monitors in the Charlotte-Gastonia-Salisbury CSA. These analyses included wind roses showing wind speeds and directions on each of the violating days and wind back-trajectories created with the National Oceanic and Atmospheric Administration's (NOAA) Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPLIT) model for all monitors and all days at and above the 76 ppb within the Charlotte-Gastonia-Salisbury CSA. An analysis of this information does not provide any conclusive evidence that the Catawba Indian Nation Reservation is contributing to violations at the monitors in the Charlotte-Gastonia-Salisbury CSA. Also, these analyses do not show that violations measured at the monitors in the area would be representative of the air quality on the Reservation.

Factor 4: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might affect the air shed and, therefore, the distribution of ozone over the area.

The Catawba Indian Country does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a significant role in this evaluation.

Factor 5: Jurisdictional boundaries

The jurisdictional boundary analysis is conducted to evaluate whether boundaries exist to clearly establish the area pertaining to the designation request and to enable carrying out of the air quality planning and enforcement functions for nonattainment areas.

As described above, the Catawba Indian Nation Reservation consists of two tracts of land within York County, South Carolina. The Catawba Indian Nation is a federally-recognized Indian Tribe, and the Reservation tracts are held by the Federal Government in trust for the Tribe. Pursuant to the Catawba Indian Claims Settlement Act, S.C. Code Ann. § 27-16-120, all State and local environmental laws and regulations apply to the Catawba Indian Nation members and Reservation and such laws and regulations are fully enforceable by all relevant State and local agencies and authorities. The Tribe, however, does retain authority to impose regulations applying higher environmental standards to the Reservation. *Id.* Based upon these facts, the jurisdictional boundaries of the Reservation provide sufficiently clear defined legal boundaries for the purpose of carrying out of the air quality planning and enforcement functions for adjacent nonattainment areas. In addition, the legal authority of the State of South Carolina and local agencies to regulate and enforce air quality standards on the Reservation is well defined.

Conclusion

EPA has evaluated the additional information submitted by the Catawba Indian Nation, and has concluded that there is no indication that activities on the Catawba Indian Nation Reservation are contributing to the violations at the monitors in the Charlotte-Gastonia-Salisbury CSA. Also, there is no indication that violations measured at the monitors in the Charlotte-Gastonia-Salisbury CSA would be representative of the air quality on the Catawba Indian Nation Reservation. Therefore, the Catawba Indian Nation Reservation is being designated as an unclassifiable/attainment area separate from the Charlotte-Rock Hill, NC-SC nonattainment area for the 2008 Ozone NAAQS.