State of North Carolina's

Recommendation on Boundaries

of 8-Hour Ozone

Nonattainment Areas

March 12, 2009
Governor Beverly Perdue

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Introduction

The purpose of this document is to provide the State of North Carolina's recommendations on boundaries for the 8-hour ozone standard nonattainment areas. This package is in response to the promulgation of a revised 8-hour ozone national ambient air quality standard (NAAQS) by the United States Environmental Protection Agency (EPA) on March 12, 2008.

EPA has instructed the States to submit their recommendations for nonattainment boundaries for any monitors violating this revised 8-hour ozone standard by March 12, 2009. EPA will then provide comments back to the States by no later than November 12, 2009. These written comments from EPA begin a 120-day period during which the States and EPA will attempt to work out any issues on the nonattainment boundaries. EPA will make the final decision on boundaries by March 12, 2010. This final decision on 8-hour ozone nonattainment areas will subsequently be published in the Federal Register and codified in 40 CFR 81.

Background

The Clean Air Act (CAA) requires EPA to designate areas as attainment or nonattainment following the promulgation of a new NAAQS. The nonattainment boundaries are to be based on the data collected at the ambient air monitoring stations. The State and local air programs operate the ozone monitoring sites. The data is quality assured, and then submitted to EPA where it becomes part of a national database. The CAA requires that the monitoring data be evaluated to determine which monitors meet the standard and which monitors violate the standard. For the 8-hour ozone standard, three years worth of data for each monitor is evaluated. The fourth highest daily maximum 8-hour ozone value for each of the three years is averaged together, and the resulting average is then compared to the standard. The three-year average is referred to as the design value. With their action on March 12, 2008, EPA revised the 8-hour ozone standard to 0.075 parts per million (ppm). Therefore, a monitored three-year average of 0.075 ppm is considered to meet or attain the standard, while a three-year average of 0.076 ppm or greater is considered to violate the ambient standard.

North Carolina has evaluated the ozone monitoring data for the State for the most recent three-year period of 2006-2008, and has determined that a total of 27 out of 40 monitors currently violate the new 8-hour ozone standard. Additionally, the discontinuation of a monitor in western Pitt County in 2007 and the subsequent establishment of a new monitor in central Pitt County in 2008 have resulted in insufficient data to calculate an appropriate 2006-2008 design value at either location and therefore these sites are unclassifiable at this time. A map showing the 8-hour ozone design values across North Carolina is included as Figure 1. This map and a table used for calculating the respective design values are included in Appendix A. The highest design value in the State at 0.094 ppm is observed at a monitor located in northeastern Mecklenburg County. The lowest design value in the State at 0.065 ppm is observed at the Bryson City monitor in central Swain County. The higher design values tend to occur along the I-85/I-40 corridor stretching throughout the Piedmont Crescent from Charlotte through the Triad and to the Triangle. This is the most heavily urbanized and industrialized region of North Carolina. There are also four monitors in the North Carolina Mountains that are minimally violating the standard. All of the violating monitors in the mountains are located above 4500 feet and experience the highest ozone concentrations during the middle of the night, which is indicative of transported pollution and not the result of local emissions sources.

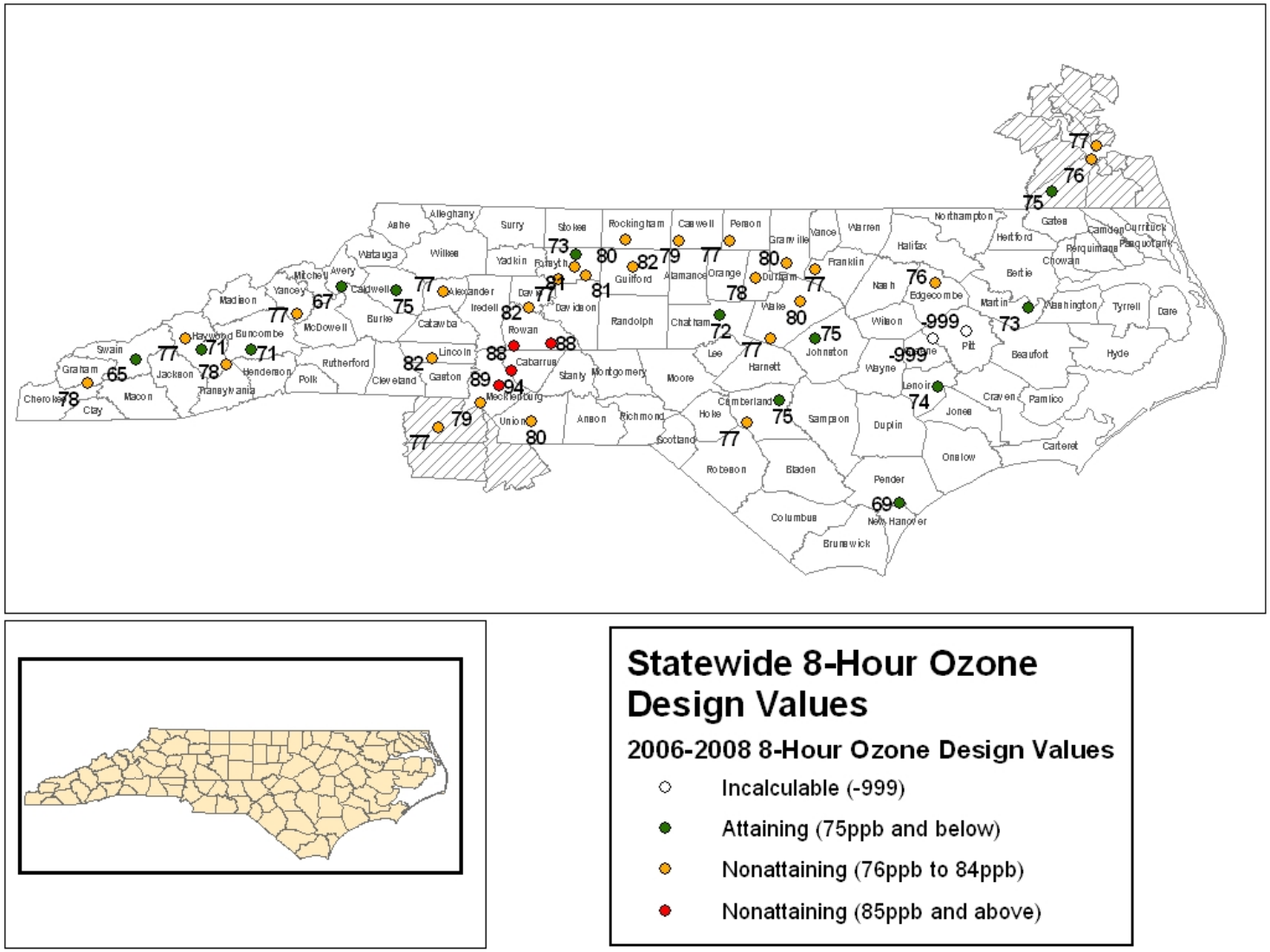

Figure 1: North Carolina's 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Summary of Recommendations

The State of North Carolina's recommendations for the designation of areas of the state for the new 8-hour ozone standard is demonstrated in the attached map entitled, "North Carolina's Proposal on Potential 8-hour Ozone Nonattainment Boundaries" (Figure 2). The recommendations include: full county nonattainment designation for Alamance, Alexander, Cabarrus, Caswell, Catawba, Cumberland, Davidson, Davie, Durham, Edgecombe, Forsyth, Franklin, Gaston, Granville, Guilford, Lincoln, Mecklenburg, Nash, Orange, Person, Rockingham, Rowan, Union, and Wake Counties; partial county nonattainment designation for Buncombe, Burke, Caldwell, Chatham, Cherokee, Graham, Haywood, Henderson, Iredell, Jackson, Johnston, Madison, McDowell, Randolph, Swain, Transylvania, and Yancey Counties; unclassifiable designation for Pitt County, and attainment designation for the remaining full or partial counties in North Carolina. These various designation recommendations are further reflected in Table 1.

From November 2008 through February 2009, 22 meetings or presentations were held across North Carolina with local government elected officials, local and regional transportation planners, other State agencies, and Federal agencies. Additionally, five public meetings were conducted in each of the five most populous regions of North Carolina in January and early February 2009. At all of these meetings, background information concerning the promulgation of the revised 8-hour ozone standard and the implications to North Carolina based on current monitoring data were presented. Central to the discussion during these meetings were two maps: one map demonstrating the potential nonattainment areas following EPA's presumptive boundaries of full county designations of entire Core Based Statistical Areas (CBSA - which is either a metropolitan or micropolitan statistical area) or entire Combined Statistical Areas (CSA - which is a combination of adjacent CBSA's) with monitors violating the ozone standard, counties outside of a CBSA or CSA with violating monitors, and counties believed to contribute to the ozone problem (Figure 3); and one map demonstrating the potential nonattainment areas based on a proposal by the North Carolina Division of Air Quality (Figure 4).

This designation recommendation takes into consideration comments received during the 22 governmental meetings, during the five public meetings, and during the public comment period that ended on February 9, 2009. Appendix B contains the comments received. The basic rationale for the designation recommendations is that in the core urban areas of a CBSA or CSA, whole counties are selected where the violating ozone design values are observed. In the less urbanized areas of a CBSA or CSA, partial counties are selected where the population and vehicle miles traveled are relatively low and where the monitoring data demonstrates attainment of the 8-hour ozone standard. In most instances, the partial county designations were represented by Metropolitan Planning Organization (MPO) or township boundaries that are immediately connected with the core of the CBSA or CSA. In the mountain areas (Buncombe, Cherokee, Graham, Haywood, Henderson, Jackson, Madison, McDowell, Swain, Transylvania, and Yancey Counties), the North Carolina portion of the Great Smoky Mountains National Park, the North Carolina portion of the Joyce Kilmer-Slickrock Area, the Shining Rock Wilderness Area, and elevations above 4000 feet in the Snow Bird, Great Balsams, and Black Mountains are being recommended for designation. This is due to the before mentioned violations occurring only at high elevation monitors in these areas. A letter from the U.S. National Park Service is attached in Appendix C supporting the nonattainment boundary recommendation for the Great Smoky Mountains National Park. This letter was submitted in 2000 during an earlier boundary recommendation process, but recent discussions with

the U.S. National Park Service revealed that they continue to believe that the entire Great Smoky Mountains National Park should be designated as nonattainment. Additionally, a correspondence from the U.S. Forest Service is attached in Appendix C supporting the nonattainment boundary recommendations for both the Joyce-Kilmer – Slickrock and the Shining Rock Wilderness Areas. The full discussion of the partial county designations, including a discussion on the mountain area designations, is provided later.

These recommendations address the designation area boundaries criteria laid out in the December 4, 2008 memo from Robert J. Meyers, Principal Deputy Assistant Administrator entitled, "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards". This guidance is attached in Appendix D. The designation recommendations are also consistent with the methodology behind the establishment of all existing and previous 8-hour ozone nonattainment area boundaries in North Carolina. A map of North Carolina's existing and previous nonattainment area boundaries is provided in Appendix E.

The final designation by EPA of the nonattainment areas is only the first step in the implementation of the revised 8-hour ozone standard. The next major requirement is the development of the State Implementation Plan that contains the necessary strategies to be implemented by the state so that all areas can attain the standard by the attainment date. In order to accomplish this requirement, North Carolina is in the process of beginning a modeling analysis to conclude what control strategies are necessary to address the current 8-hour violations in the State. This modeling analysis will be coordinated through a collaboration amongst states throughout the Southeast, Midwest, and Mid-Atlantic. This multi-state and multi-region collaboration ensures that North Carolina is accurately projecting future emissions and air quality scenarios in the modeling analysis and is appropriately developing control strategies that will ultimately lead to expeditious statewide attainment of the revised 2008 8-hour ozone standard.

North Carolina has already undertaken substantial and progressive emissions reduction strategies over the past decade. These strategies have allowed North Carolina to achieve almost statewide attainment of the 1997 8-hour ozone standard. The North Carolina General Assembly adopted the Clean Air Bill of 1999 that changed the State's vehicle inspection and maintenance (I/M) program to an on-board diagnostic (OBD) program and expanded the program to 48 counties that captured greater than 80% of the vehicles in North Carolina. This OBD based I/M program is one of the most expansive in the country. Appendix G contains a county map of where the I/M program is currently required for cars and light-duty trucks. Additional actions taken by North Carolina include the adoption of the NOx SIP call rules and the North Carolina General Assembly approval of an aggressive multi-pollutant bill (Clean Smokestacks Act) in 2002 that has resulted in significant reductions in sulfur dioxide, as well as year round reductions in nitrogen oxides from the State's two largest utilities. Both of the legislative actions demonstrate North Carolina's willingness and statutory authority to establish emissions control programs regardless of a Federal nonattainment designation status. Finally, North Carolina maintains a nationally recognized air quality action day program in the six most populous regions of the state. This program advises citizens of upcoming air quality events so that the public can better protect their health and take action to reduce their own emission producing activities.

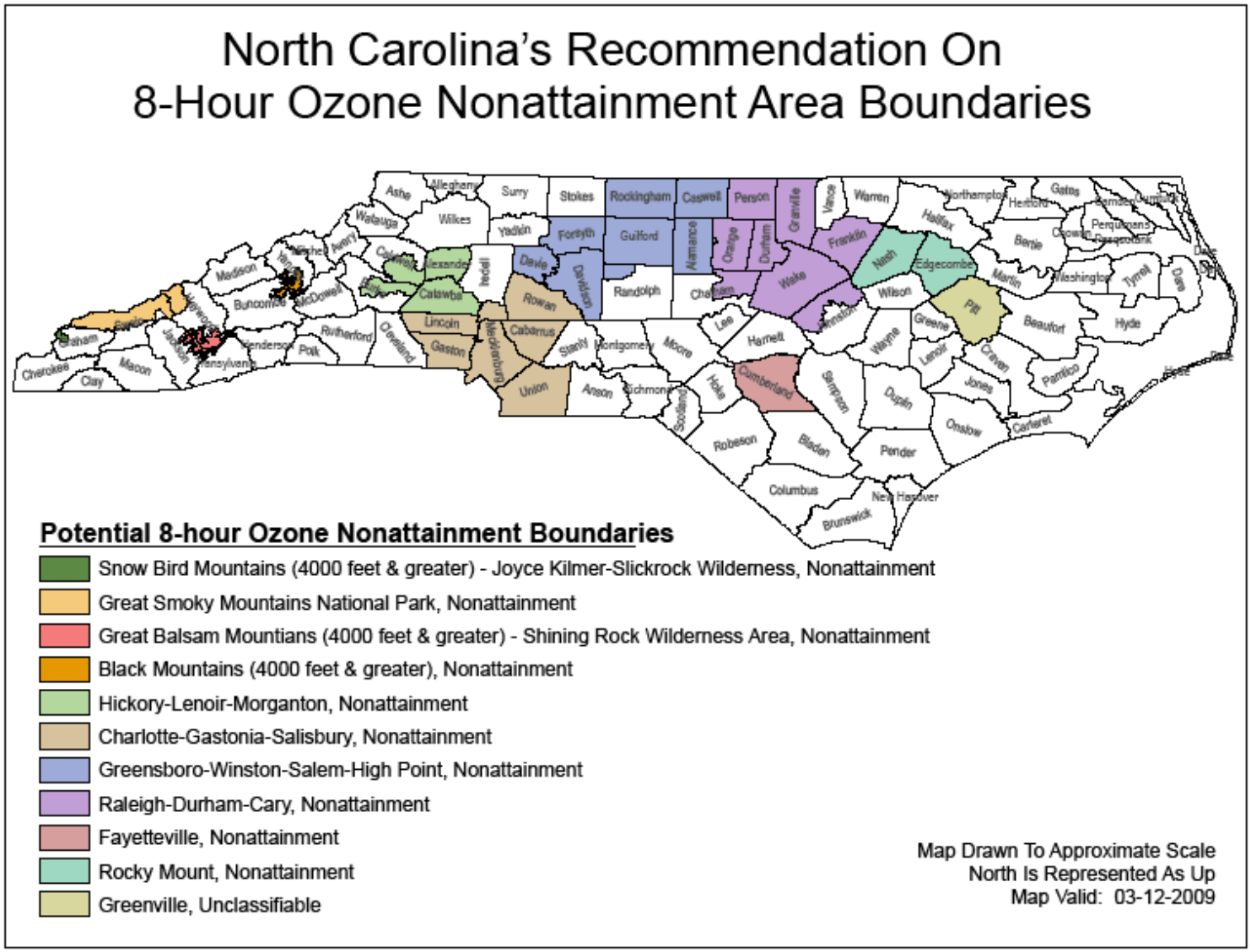

Figure 2: North Carolina's Recommendation On 8-Hour Ozone Nonattainment Area Boundaries

Following in Table 1 is North Carolina's recommendation of areas as nonattainment, unclassifiable, or attainment under the revised 8-hour ozone standard.

Table 1: North Carolina – Ozone (8-Hour Standard)

Designated Area	Designation Type	Classification Type
Snow Bird Mountains – Joyce Kilmer-Slickrock Wilderness Area: Graham County Above 4000 feet elevation in the Snow Bird Mountains range Joyce Kilmer-Slickrock Wilderness Area boundary Cherokee County Above 4000 feet elevation in the Snow Bird Mountains range	Nonattainment	
Great Smoky Mountains National Park: Haywood County Park boundary Swain County Park boundary	Nonattainment	
Great Balsam Mountains – Shining Rock Wilderness Area: Buncombe County Above 4000 feet elevation in this mountain range Haywood County Above 4000 feet elevation in this mountain range Shinning Rock Wilderness Area boundary Henderson County Above 4000 feet elevation in this mountain range Jackson County Above 4000 feet elevation in this mountain range Transylvania County Above 4000 feet elevation in this mountain range	Nonattainment	

Designated Area	Designation Type	Classification Type
Black Mountains: Buncombe County Above 4000 feet elevation in this mountain range Madison County Above 4000 feet elevation in this mountain range McDowell County Above 4000 feet elevation in this mountain range Yancey County Above 4000 feet elevation in this mountain range	Nonattainment	
Hickory-Lenoir-Morganton Area: Alexander County Burke County Unifour Metropolitan Planning Organization boundary Caldwell County Unifour Metropolitan Planning Organization boundary Catawba County	Nonattainment	
Charlotte-Gastonia-Salisbury Area: Cabarrus County Gaston County Iredell County Davidson Township Coddle Creek Township Lincoln County Mecklenburg County Rowan County Union County	Nonattainment	

Designated Area	Designation Type	Classification Type
Greensboro-Winston-Salem-High Point Area: Alamance County Davidson County Forsyth County Guilford County Caswell County Davie County Orange County Burlington-Graham Metropolitan Planning Organization boundary Randolph County High Point Metropolitan Planning Organization boundary Rockingham County	Nonattainment	
Raleigh-Durham-Cary Area: Chatham County Baldwin Township Center Township New Hope Township Williams Township Durham County Franklin County Granville County Johnston County Capital Area Metropolitan Planning Organization boundary Orange County Outside Burlington-Graham Metropolitan Planning Organization boundary Person County Wake County	Nonattainment	
Fayetteville Area: Cumberland County	Nonattainment	

Designated Area	Designation Type	Classification Type
Rocky Mount Area: Edgecombe County Nash County	Nonattainment	
Greenville Area: Pitt County	Unclassifiable	
Rest of State	Attainment	

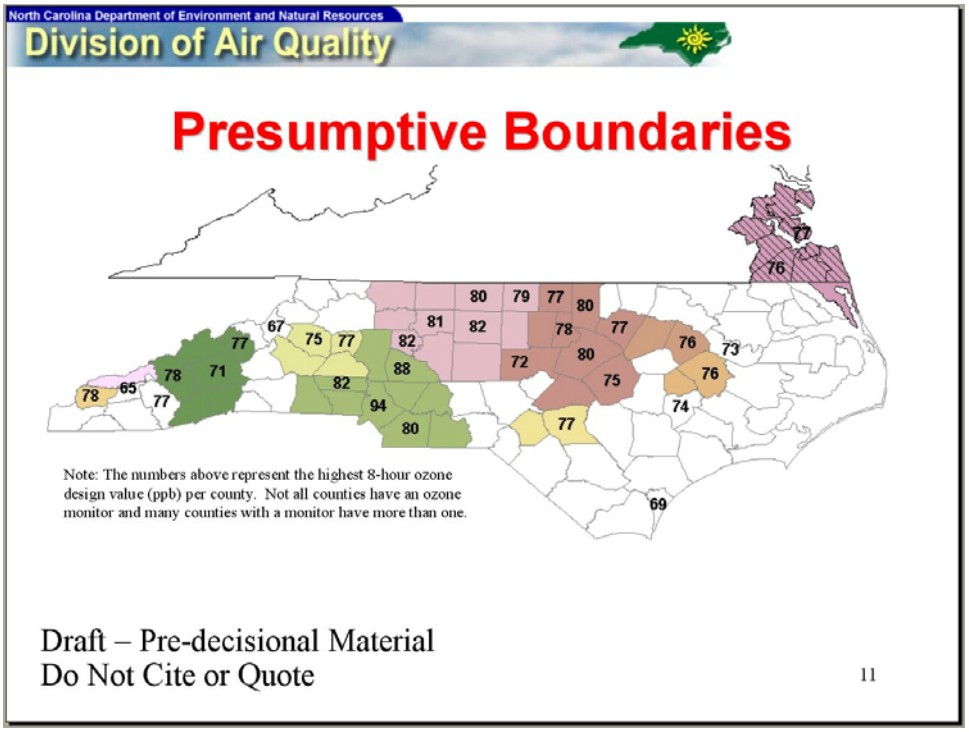

Figure 3: Potential 8-hour Ozone Nonattainment Areas Map Following EPA's Presumptive Full CSA/MSA and Full County Boundaries (As Presented at Governmental and Public Meetings)

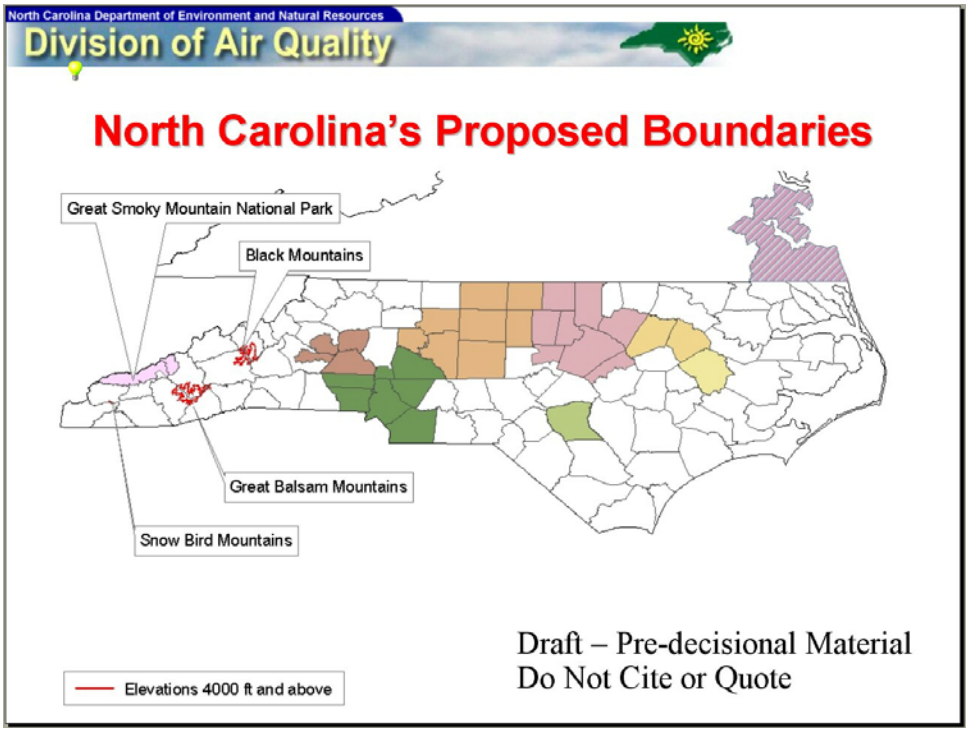

Figure 4: North Carolina's Proposed 8-hour Ozone Nonattainment Areas Map (As Presented at Governmental and Public Meetings)

Area Specific Recommendations on Boundaries for 8-hour Ozone Nonattainment

The purpose of the remainder of this document is to address the criteria that EPA established for considering boundaries less than the full CBSA or CSA for nonattainment designation. These criteria are outlined in the before mentioned "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards" memo, which is attached in Appendix D. The remaining documentation only addresses in detail those areas where North Carolina's recommendation is less than the full CBSA or CSA, where additional areas beyond a CBSA or CSA are recommended for nonattainment designation, or where there is incomplete air quality data and an unclassifiable designation is recommended.

Snow Bird Mountains – Joyce Kilmer-Slickrock Wilderness Area Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Graham County

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Elevations above 4000 feet elevation in the Snow Bird Mountains range (Cherokee and Graham Counties) and the Joyce Kilmer-Slickrock Wilderness Area (Graham County)

Discussion:

Graham County is not a portion of a CBSA or CSA. There are not any major urban areas within Graham County, and it is considered one of North Carolina's most rural counties. There is only one ozone monitor in Graham County (reference Figure 6), and this site is located above 4000 feet elevation in the Snow Bird Mountains range that straddles the Cherokee and Graham County line. This monitoring site was originally established to help understand the air quality impacting the nearby Joyce Kilmer-Slickrock Wilderness Area without having to disturb land specifically within this Wilderness Area. With this in mind, the nonattainment boundary recommendation includes all of the Joyce Kilmer-Slickrock Wilderness Area despite being geographically separated from the violating monitor (see Figure 5). The additional rationale for the recommended 8-hour ozone nonattainment boundary is outlined in the following 9 factors.

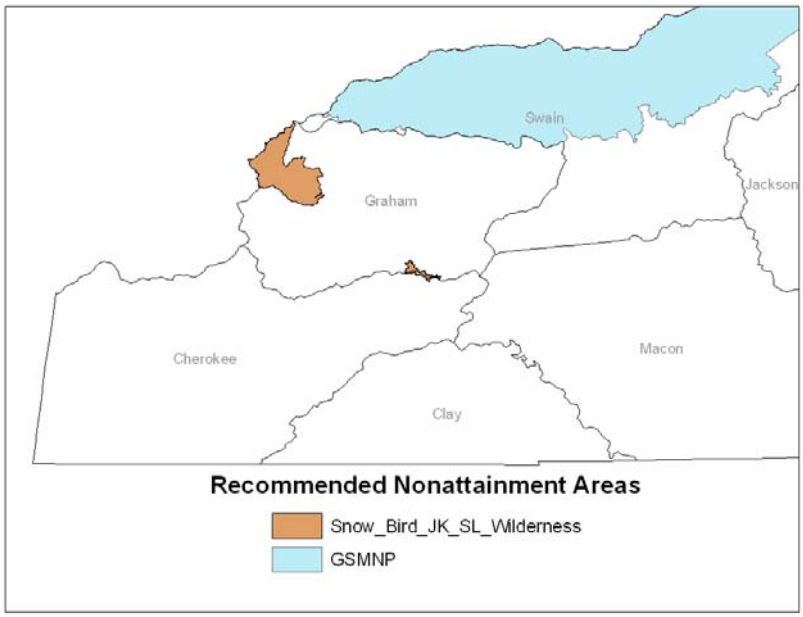

Figure 5: Recommended Nonattainment Areas. Snow Bird Mountains – Joyce Kilmer-Slickrock Wilderness Area nonattainment area shaded in orange

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Air quality data:

The Joanna Bald monitor, located above 4000 feet, at elevation 4688 feet, in the Snow Bird Mountains has a design value of 0.078 ppm. The readings at the ridge top monitors experience the highest ozone concentrations during the middle of the night, which is indicative of transported pollution. The Bryson City monitor, located in a valley at 2159 feet just east of Graham County and outside of the recommended nonattainment area, has a design value of 0.065 ppm, the lowest design value in the state. The readings at the valley monitors below 4000 feet show that local precursor sources are not significantly contributing to the ozone violations at monitors above 4000 feet.

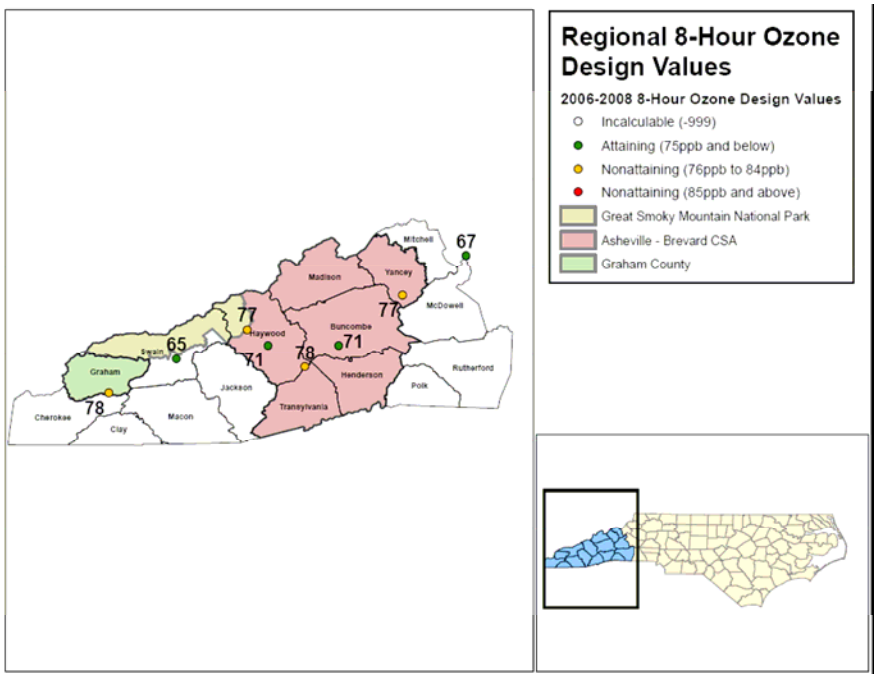

Figure 6: Western NC Regional 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Table 2: Snow Bird Mountains – Joyce Kilmer-Slickrock Wilderness Area Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Snow Bird Mountains - Joyce Kilmer-Slickrock Wilderness Area	Joanna Bald	37-075-0001	0.079	0.076	0.081	0.078	0.078	0.078

Emissions Data:

There are minimal emissions sources of either precursor pollutants (NOx and VOC) in the recommended nonattainment area. The surrounding region has minimal anthropogenic emissions sources of either precursor pollutants (NOx and VOC). The only significant point emissions source in Graham County is Stanley Furniture, with 21 tons/year of NOx and 337 tons/year of VOC.

Population Density And Degree Of Urbanization:

Graham County has a population of 8,144 (2007 estimate) and a population density of 27 people per square mile. This is one of the least densely populated counties in North Carolina and the entire eastern United States. Surrounding counties also have low population density. Nearby valley monitors below 4000 feet have design values well below the NAAQS, which shows that local precursor sources are not significantly contributing to the ozone violations at monitors above 4000 feet. The recommended nonattainment area has very low population, estimated around 350 people and possibly as low as 0-5 people. (Please see Appendix I for maps of population density)

Traffic And Commuting Patterns:

There are not any significant roadways within the recommended nonattainment area. Practically all of the VMT in Graham County is outside of the recommended nonattainment area boundary.

Growth Rates And Patterns:

Population growth in Graham County from 2000-2010 is 2.7% and from 2010-2020 is 1.6%. The population growth in the recommended nonattainment area is expected to be negligible.

Meteorology:

The violating ridge top monitors are located above the nocturnal boundary layer and are near or within the subsidence inversion at the top of the daytime mixed layer. Because of this stratification, the air at elevations above 4000 feet is characterized by long range transport and has different diurnal patterns than locations within the valleys. Backward trajectories in Appendix M show that air parcels on days with ozone at or above 76 ppb originate from areas outside the region including the western piedmont of North Carolina, Tennessee, and the Ohio River Valley, suggesting that the inclusion of elevations below 4000 feet in the nonattainment area would have little impact on the violating monitors located above 4000 feet.

Geography / Topography:

The Joanna Bald ozone monitor is considered a high-elevation or ridge top monitor. Much like all the other ridge top ozone monitors in Western North Carolina, Joanna Bald does not have a normal diurnal ozone response profile similar to ozone monitors in the valleys of the Mountains and throughout the balance of the Piedmont, Sandhills, and Coastal Plains. Instead of recording exceedances of the 8-hour ozone standard during the middle of the afternoon when ozone production and photochemistry is at a maximum, the ozone exceedances at Joanna Bald and other ridge top monitors occur during the nighttime hours. This timing of the exceedances is indicative of transport and not local generation of ozone, since the ozone chemistry stops once the sun sets. Figure 7 demonstrates a typical comparison between a mountain ridge top monitor (red line), a mountain valley monitor (blue), and a large metropolitan area monitor (yellow).

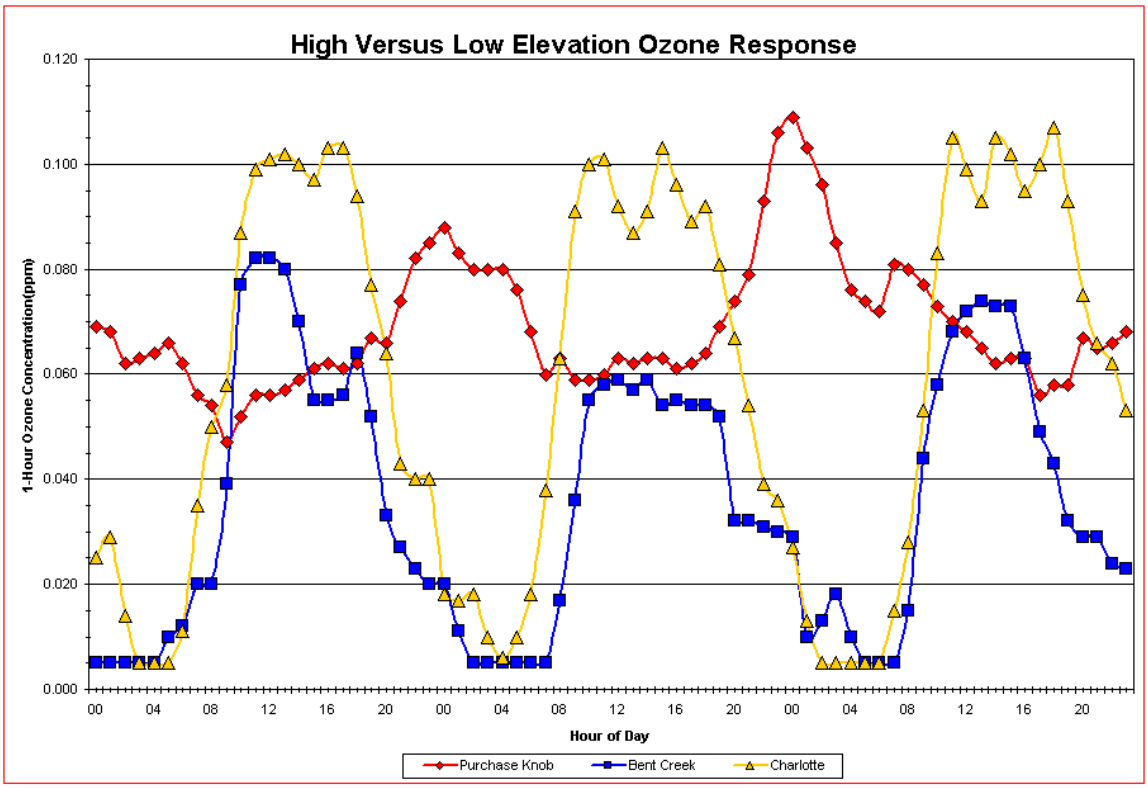

Figure 7: Diurnal Ozone Profile Comparison (Ridge Top, Valley, and Large Metropolitan Sites)

Jurisdictional Boundaries:

Parts of the Qualla Boundary, also known as the Eastern Cherokee Indian Reservation, are located in Graham County. These sections of the Qualla Boundary are non-contiguous and are separate from the primary part of the Qualla Boundary located in Swain and Jackson counties. The Cherokees who live in Graham County form the Snowbird Cherokee community. Although there are the described tribal lands in Graham County, the Snowbird Mountains at elevation 4000 feet and above that are recommended to be designated nonattainment are not on any tribal lands. Also the area recommended to be designated nonattainment has never been part of a nonattainment area, is not in a CSA, and does not have an MPO.

Level of Control of Emission Sources:

No OBD-based I/M program exists in this county; however, an annual visual inspection of emissions equipment for tampering is required. Other Federal and state (North Carolina and surrounding states) mobile and point strategies to reduce emissions will have a much greater impact in reducing ozone levels below the NAAQS above 4000 feet.

- ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Great Smoky Mountains National Park Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Haywood County (as a part of a larger Asheville nonattainment area also including Buncombe, Henderson County, Madison, Transylvania, and Yancey Counties)

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Haywood County
    Park boundary
Swain County
    Park boundary

Discussion:

The Great Smoky Mountains National Park is not a portion of a CBSA or CSA. There are not any major settlements within the park, and being a national park it can be considered an undeveloped tract of land. There is only one ozone monitor within the park boundaries in the North Carolina portion of the park (reference Figure 6), and this site is located above 4000 feet elevation in Haywood County. Since nearby low elevation sites are in attainment, North Carolina agrees with the presumptive nonattainment boundary of the Great Smoky Mountains National Park (see Figure 8). The additional rational for the recommended 8-hour ozone nonattainment boundary is outlined in the following 9 factors.

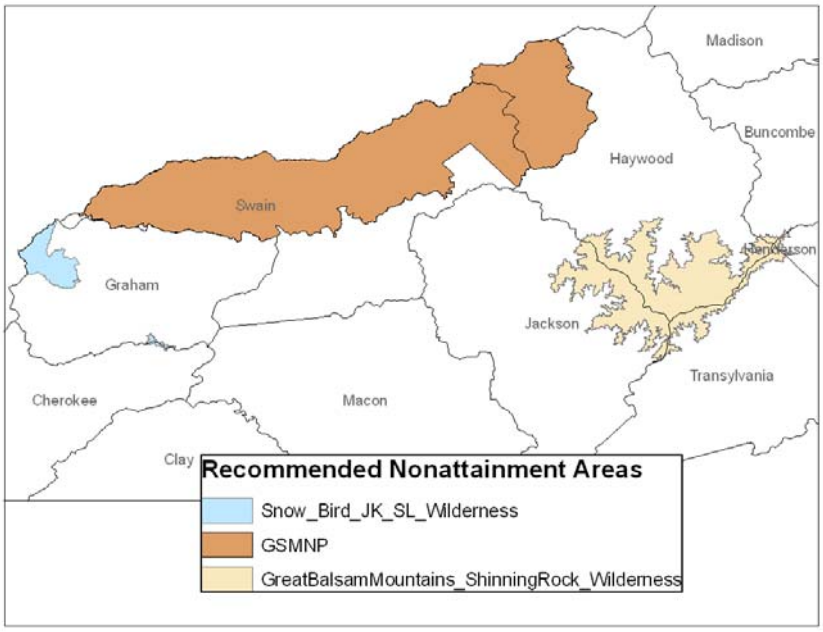

Figure 8: Recommended Nonattainment Areas. Great Smoky Mountains National Park nonattainment area shaded in orange.

Air quality data:

The Purchase Knob monitor, located above 4000 feet at elevation 5085 feet in the Great Smoky Mountains National Park, has a design value of 0.077 ppm. The nearest monitors to the Park outside of the recommended nonattainment area are at Waynesville, with a design value of 0.071 ppm, and Bryson City, with a design value of 0.065 ppm. The readings at the ridge top monitors experience the highest ozone concentrations during the middle of the night, which is indicative of transported pollution.

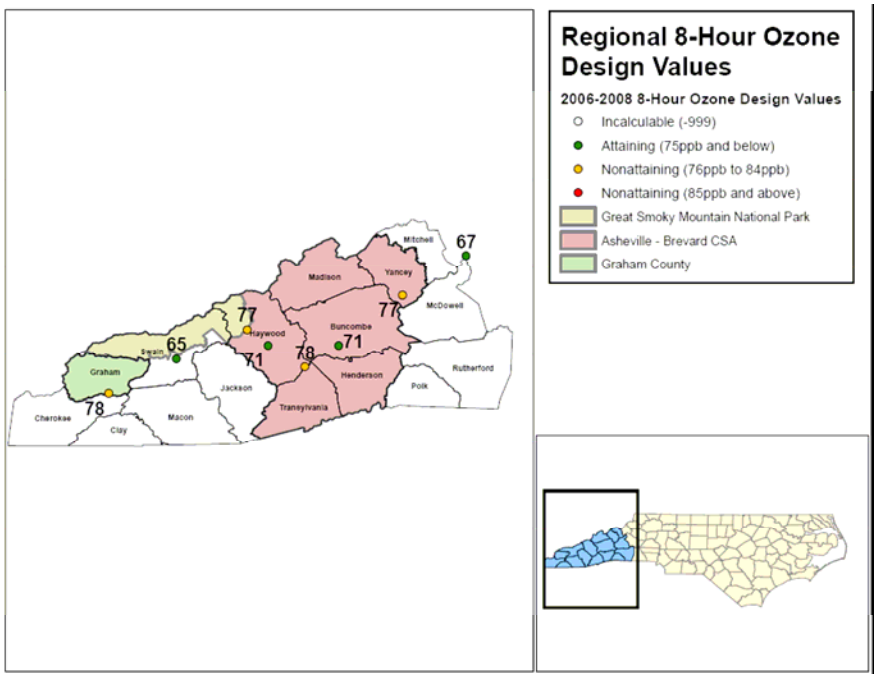

Figure 9: Western NC Regional 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Table 3: Great Smoky Mountains National Park Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Great Smoky Mountains National Park	Purchase Knob (Ridge Top)	37-087-0036	0.084	0.073	0.078	0.080	0.078	0.077
	Waynesville (Valley)	37-087-0004	0.074	0.069	0.074	0.071	0.072	0.071
	Bryson (Valley)	37-173-0002	0.070	0.063	0.066	0.068	0.066	0.065

Emissions Data:

There are minimal emissions sources of either precursor pollutants (NOx and VOC) in the recommended nonattainment area. The surrounding region has minimal anthropogenic emissions sources of either precursor pollutant (NOx and VOC).

Population Density And Degree Of Urbanization:

There are approximately 183 people, which is less than 0.3 percent of the total population in the counties where the recommended nonattainment area is located, living in the North Carolina

portion of the Great Smoky Mountains National Park. (Please see Appendix I for maps of population density)

Traffic And Commuting Patterns:

The minimal amount of the VMT within the recommended nonattainment area is associated with the US441. Given the remote nature of the Great Smoky Mountains National Park, the vast majority of the VMT in Haywood and Swain Counties is outside of the Park jurisdictional boundary and the recommended nonattainment area boundary.

Growth Rates And Patterns:

Population growth within the Great Smoky Mountains National Park is projected to be minimal.

Meteorology:

The violating ridge top monitors are located above the nocturnal boundary layer and are near or within the subsidence inversion at the top of the daytime mixed layer. Because of this stratification, the air at elevations above 4000 feet is characterized by long range transport and has different diurnal patterns than locations within the valleys. Backward trajectories in Appendix M show that air parcels on days with ozone at or above .076 ppm originate from areas outside the region including the western Piedmont of North Carolina, Tennessee, and the Ohio River Valley, suggesting that the inclusion of elevations below 4000 feet in the nonattainment area would have little impact on the violating monitors located above 4000 feet.

Geography / Topography:

The Purchase Knob ozone monitor is considered a high-elevation or ridge top monitor. Much like all the other ridge top ozone monitors in Western North Carolina, Purchase Knob does not have a normal diurnal ozone response profile similar to ozone monitors in the valleys of the Mountains and throughout the balance of the Piedmont, Sandhills, and Coastal Plains. Instead of recording exceedances of the 8-hour ozone standard during the middle of the afternoon when ozone production and photochemistry is at a maximum, the ozone exceedances at Purchase Knob and other ridge top monitors occur during the nighttime hours. This timing of the exceedances is indicative of transport and not local generation of ozone, since the ozone chemistry stops once the sun goes sets. Figure 10 demonstrates a typical comparison between a mountain ridge top monitor (red line), a mountain valley monitor (blue), and a large metropolitan area monitor (yellow).

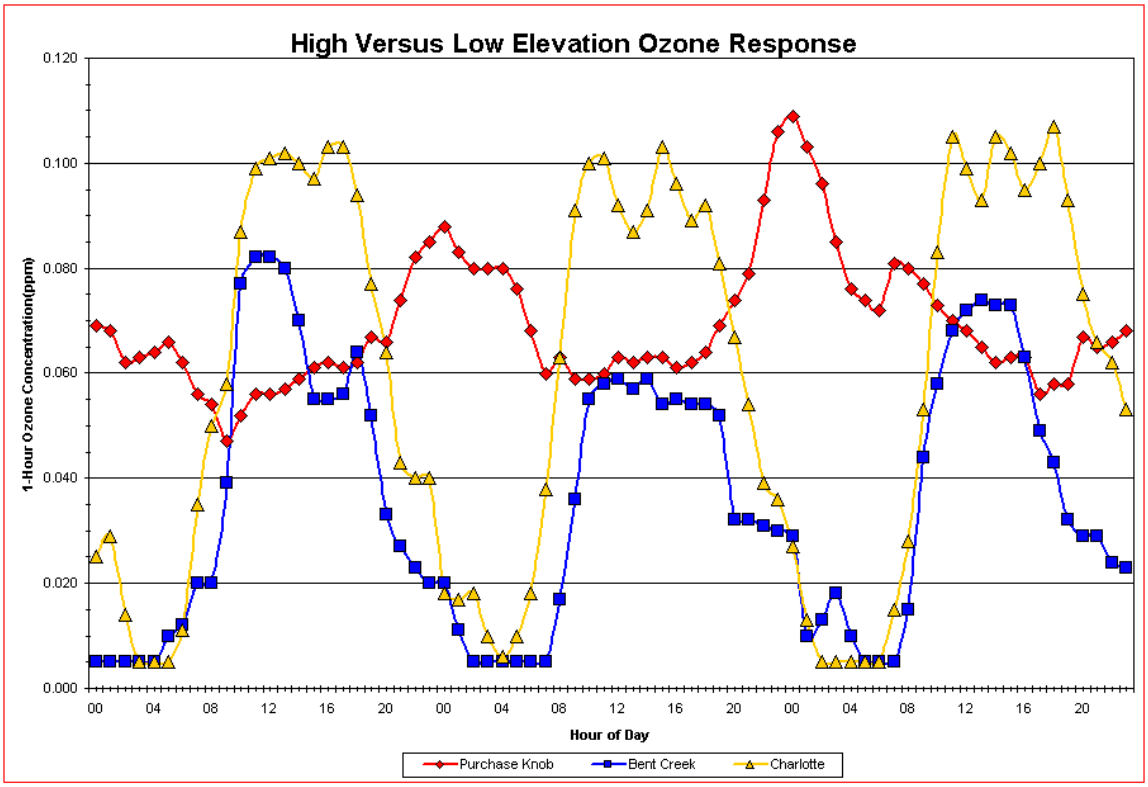

Figure 10: Diurnal Ozone Profile Comparison (Ridge Top, Valley, and Large Metropolitan Sites)

Jurisdictional Boundaries:

The Great Smoky Mountains National Park defines the boundary of the nonattainment area. Haywood County, one of the counties where the Park is located, was one of the counties in the Mountain Early Action Compact (EAC) under the 1997 8-hour ozone standard. Haywood and Swain counties are currently attaining the standard and a redesignation submittal is in process.

Level of Control of Emission Sources:

Other Federal and state (North Carolina and surrounding states) mobile and point strategies to reduce emissions will have a much greater impact in reducing ozone levels below the NAAQS above 4000 feet. Haywood County currently has an OBD based I/M program. Swain County does not have an OBD-based program, but requires an annual visual inspection of emissions equipment for tampering.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new OBD based I/M program was adopted in 1999.

Great Balsam Mountains – Shining Rock Wilderness Area Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Buncombe, Haywood, Henderson, and Transylvania Counties (as part of a larger Asheville nonattainment area also including Madison and Yancey Counties)

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Elevations above 4000 feet elevation in the Great Balsam Mountains range (includes portions of Buncombe County, Haywood County, Henderson County, Jackson County, Transylvania County) and all of the Shining Rock Wilderness Area

Discussion:

The Great Balsam Mountains and Slick Rock Wilderness area are part of the Asheville CSA. There are 5 ozone monitors in the Asheville area (reference Figure 12), and one located nearby (Purchase Knob). All of the violating monitors are located above 4000 feet with all monitors below 4000 feet easily within attainment. The different ozone distribution with elevation and corresponding back trajectory analysis shows that ozone is generated outside the Asheville area and transported into the region above 4000 feet with the upper level winds primarily from Tennessee, Georgia, Northern South Carolina, and central North Carolina. Additionally, ozone and ozone precursors may be transported longer distances from major sources within the Ohio River Valley. Since very little ozone is generated locally, we recommend the nonattainment boundary encompassing areas above 4000 feet around the violating monitor, in this case the Frying Pan monitor. The additional rationale for the recommended 8-hour ozone nonattainment boundary is outlined in the following 9 factors.

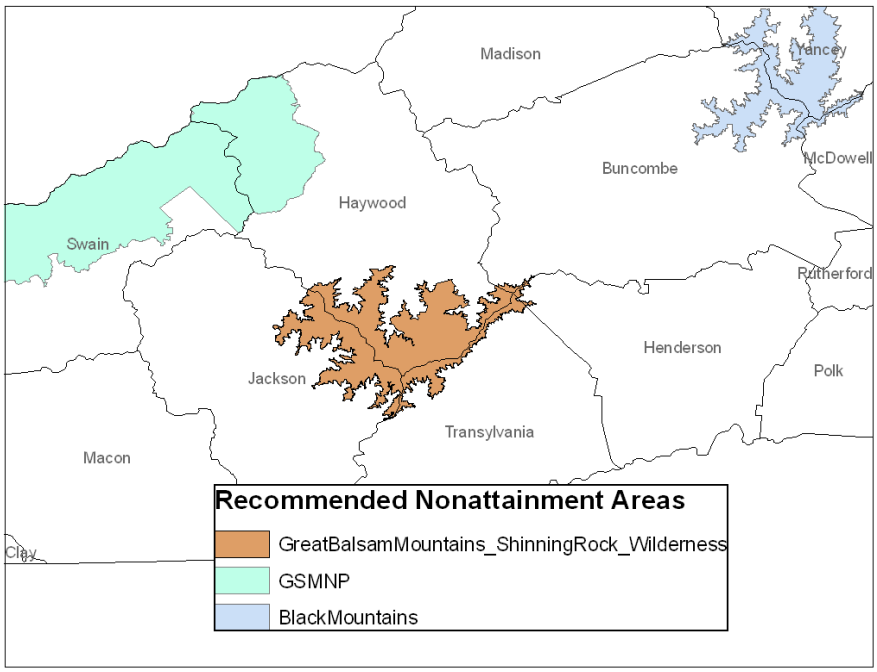

Figure 11: Recommended Nonattainment Areas Great Balsam Mountains – Shining Rock Wilderness Area nonattainment area shaded in orange.

Air quality data:

The Frying Pan monitor, located above 4000 feet at elevation 5200 feet in the Great Balsam Mountains, has a design value at 0.078 ppm. The Waynesville monitor, located in a valley at 2641 feet in Haywood County to the west outside of the recommended nonattainment area, has a design value of 0.071 ppm. The Bent Creek monitor, located in a valley at 2215 feet in Buncombe County to the east outside of the recommended nonattainment area, also has a design value of 0.071 ppm. The readings at the ridge top monitors experience the highest ozone concentrations during the middle of the night, which is indicative of transported pollution. The readings at the valley monitors below 4000 feet show that local precursor sources are not significantly contributing to the ozone violations at monitors above 4000 feet.

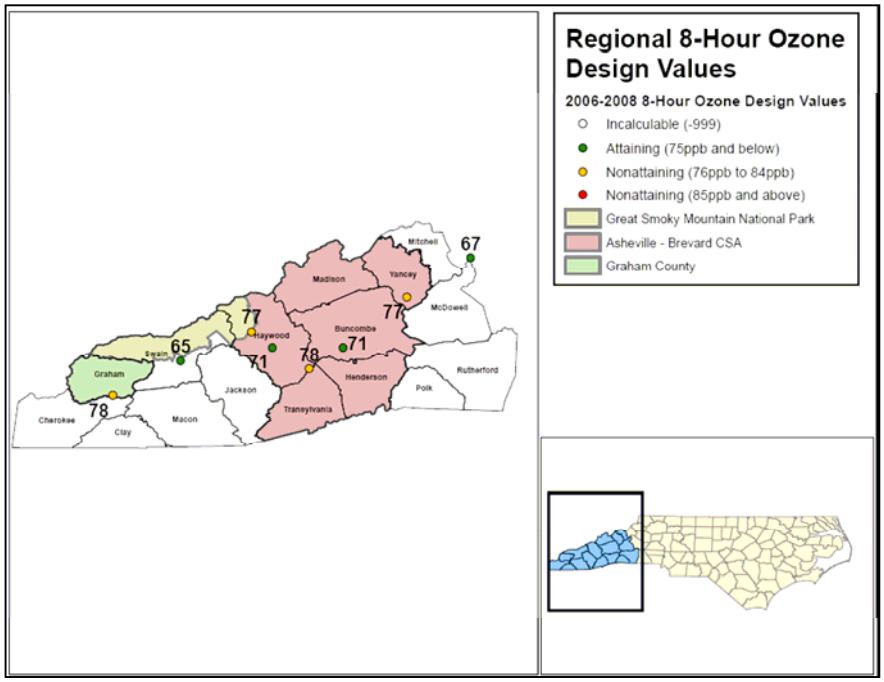

Figure 12: Western NC Regional 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Table 4: Great Balsam Mountains – Shining Rock Wilderness Area Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Great Balsam Mountains - Shining Rock Wilderness Area	Frying Pan (Ridge Top)	37-087-0035	0.082	0.079	0.077	0.080	0.079	0.078
	Waynesville (Valley)	37-087-0004	0.074	0.069	0.074	0.071	0.072	0.071
	Bryson (Valley)	37-173-0002	0.070	0.063	0.066	0.068	0.066	0.065

Emissions Data:

There are minimal emissions sources of either precursor pollutants (NOx and VOC) in the recommended nonattainment area. There are 3 NOx sources above 100 tons/year in Buncombe and Haywood Counties outside the recommended nonattainment area. There are 6 VOC sources above

100 tons/year and 2 sources from 50-100 tons/year in Buncombe, Haywood, and Henderson Counties outside the recommended nonattainment area. Trajectory analysis in Appendix M shows that these nearby sources have little impact on days with ozone violations.

Population Density And Degree Of Urbanization:

The recommended nonattainment area contains at most 2,074 people, though it may be as low as 100 people. Most of the surrounding area has low population density, with the cities of Asheville and Hendersonville having the highest population densities in the region. Valley monitors below 4000 feet located in and near these cities have design values well below the NAAQS, which shows that local precursor sources in the higher density areas are not significantly contributing to the ozone violations at monitors above 4000 feet. (Please see Appendix I for maps of population density)

Traffic And Commuting Patterns:

The minimal amount of the VMT within the recommended nonattainment area is associated with the Blue Ridge Parkway, NC Route 215, and US Route 276. Given the remote nature of the Great Balsam Mountains – Shining Rock Wilderness Area, the vast majority of the VMT in Buncombe, Haywood, Henderson, and Transylvania Counties is outside of the recommended nonattainment boundary.

Growth Rates And Patterns:

Population growth within the Great Balsam Mountains and the Shining Rock Wilderness area is projected to be negligible. Growth in surrounding counties ranges from 5-15%.

Meteorology:

The violating ridge top monitors are located above the nocturnal boundary layer and are near or within the subsidence inversion at the top of the daytime mixed layer. Because of this stratification, the air at elevations above 4000 feet is characterized by long range transport and has different diurnal patterns than locations within the valleys. Backward trajectories in Appendix M show that air parcels on days with ozone at or above .076 ppm originate from areas outside the region including the western piedmont of North Carolina, Tennessee, and the Ohio River Valley, suggesting that the inclusion of elevations below 4000 feet in the nonattainment area would have little impact on the violating monitors located above 4000 feet.

Geography / Topography:

The Frying Pan ozone monitor is considered a high-elevation or ridge top monitor. Much like all the other ridge top ozone monitors in Western North Carolina, Frying Pan does not have a normal diurnal ozone response profile similar to ozone monitors in the valleys of the Mountains and throughout the balance of the Piedmont, Sandhills, and Coastal Plains. Instead of recording exceedances of the 8-hour ozone standard during the middle of the afternoon when ozone production and photochemistry is at a maximum, the ozone exceedances at Frying Pan and other ridge top monitors occur during the nighttime hours. This timing of the exceedances is indicative of transport and not local generation of ozone, since the ozone chemistry stops once the sun goes sets. Figure 13 demonstrates a typical comparison between a mountain ridge top monitor (red line), a mountain valley monitor (blue), and a large metropolitan area monitor (yellow).

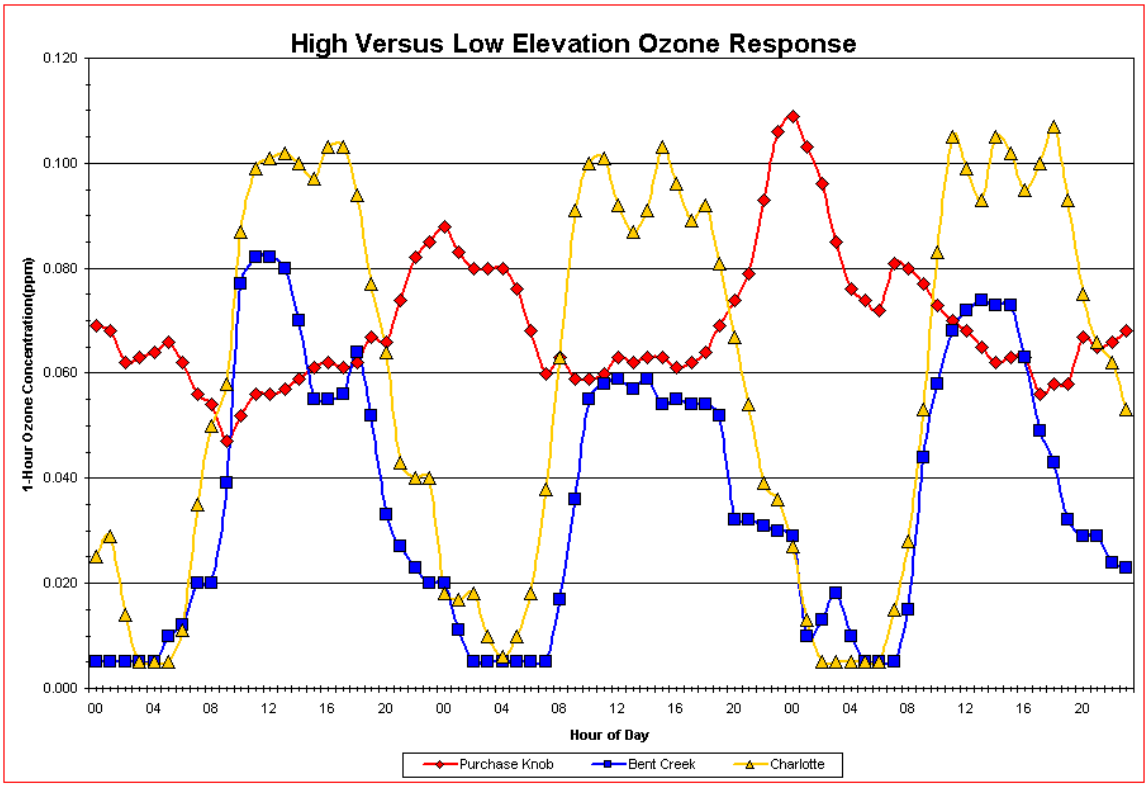

Figure 13: Diurnal Ozone Profile Comparison (Ridge Top, Valley, and Large Metropolitan Sites)

Jurisdictional Boundaries:

Haywood and Buncombe counties are part of the Mountain Area Early Action Compact (EAC) under the 1997 8-hour ozone. Shining Rock Wilderness Area boundary defines a portion of the recommended nonattainment area.

Level of Control of Emission Sources:

Mobile emissions are the largest anthropogenic source in the recommended nonattainment area. Henderson, Buncombe, and Haywood Counties all have OBD-based I/M programs. Jackson and Transylvania counties do not have OBD-based I/M programs, but an annual visual inspection of emission equipment is required. Other Federal and state (North Carolina and surrounding states) mobile and point strategies to reduce emissions will have a much greater impact in reducing ozone levels below the NAAQS above 4000 feet.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Black Mountains Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Yancey County (as part of a larger Asheville nonattainment area also including Buncombe, Haywood, Henderson, Madison, and Transylvania Counties)

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Elevations above 4000 feet elevation in the Black Mountains range (Buncombe, McDowell, Madison, and Yancey Counties).

Discussion:

The Black Mountains area is part of the Asheville CSA. There are 5 ozone monitors in the Asheville area (reference Figure 15), and 2 located nearby (Purchase Knob and Barnett Knob). All of the violating monitors are located above 4000 feet with all monitors below 4000 feet easily within attainment. The different ozone distribution with elevation shows that ozone is generated outside the Asheville area and transported into the region above 4000 feet with the upper level winds primarily from Tennessee, Georgia, Northern South Carolina, and central North Carolina. Additionally, ozone and ozone precursors may be transported longer distances from major sources within the Ohio River Valley. Since very little ozone is generated locally, we recommend the nonattainment boundary encompassing areas above 4000 feet within the Black Mountains around the violating monitor, in this case the Mount Mitchell monitor (see Figure 14). The additional rational for the recommended 8-hour ozone nonattainment boundary is outline in the following 9 factors.

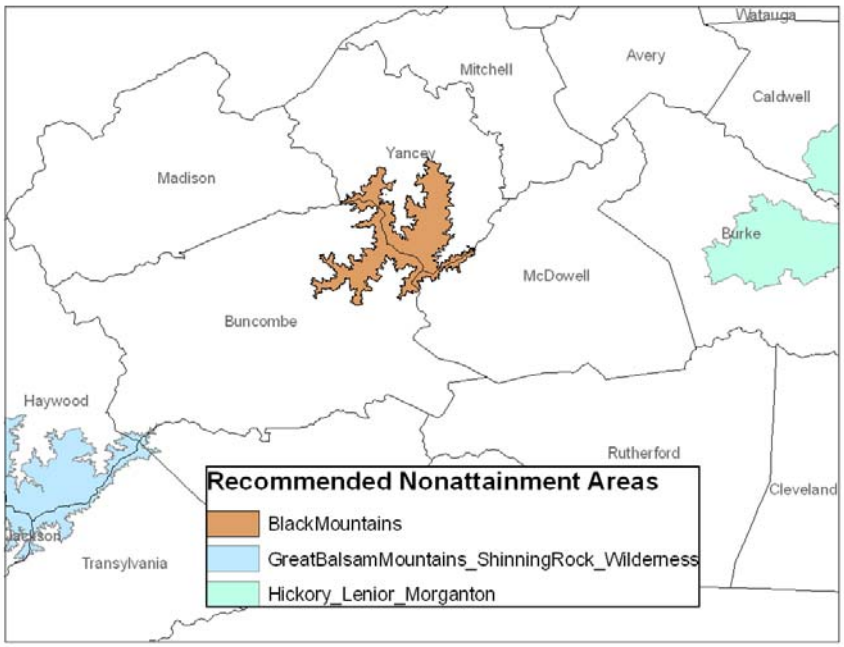

Figure 14: Recommended Nonattainment Areas. Black Mountains nonattainment area shaded in orange.

Air quality data:

The Mount Mitchell monitor, located above 4000 feet at elevation 6502 feet in the Black Mountains, has a design value at 0.077 ppm. The readings at the ridge top monitors experience the highest ozone concentrations during the middle of the night, which is indicative of transported pollution. The Bent Creek monitor, located in a valley at 2215 feet in Buncombe County to the southwest outside of the recommended nonattainment area, also has a design value of 0.071 ppm. The Linville monitor, located at 3238 feet in Avery County to the northeast outside of the recommended nonattainment area, has a design value of 0.067 ppm. The readings at the valley monitors below 4000 feet show that local precursor sources are not significantly contributing to the ozone violations at monitors above 4000 feet.

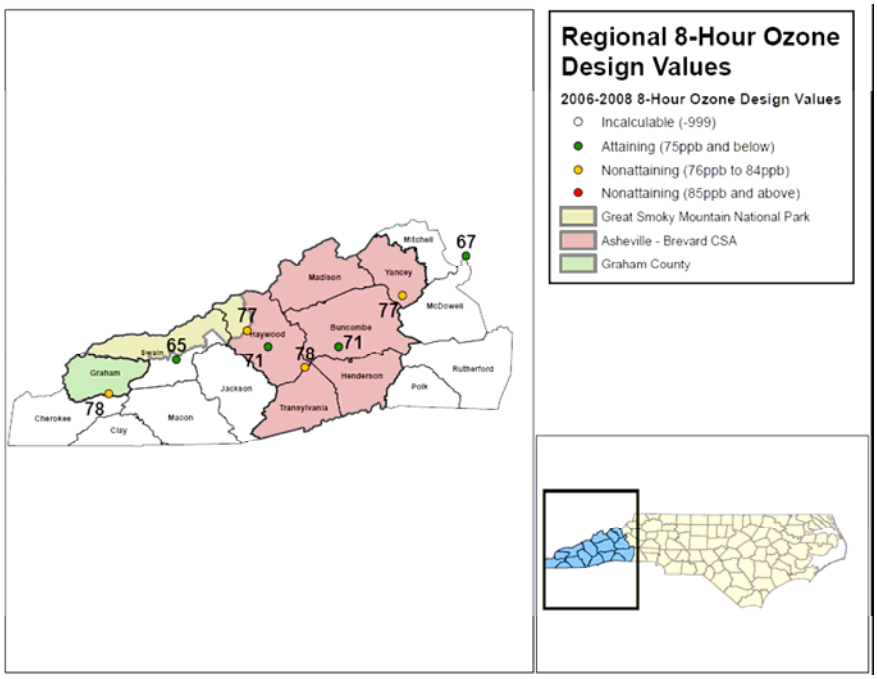

Figure 15: Western NC Regional 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Table 5: Black Mountains Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Black Mountains	Mt. Mitchell (Ridge Top)	37-199-0004	0.080	0.075	0.079	0.078	0.078	0.077
	Bent Creek (Valley)	37-021-0030	0.079	0.071	0.073	0.071	0.074	0.071

Emissions Data:

There are minimal emissions sources of either precursor pollutants (NOx and VOC) in this region.

Population Density And Degree Of Urbanization:

Approximately 2500 people live in the recommended nonattainment area. Most of the surrounding area has low population density. The city of Asheville has the highest population density in the region. Valley monitors below 4000 feet located in and near Asheville are well below the NAAQS, which shows that local precursor sources are not significantly contributing to the ozone violations at monitors above 4000 feet. (Please see Appendix I for maps of population density)

Traffic And Commuting Patterns:

Most of the traffic within the recommended nonattainment area is associated with the Blue Ridge Parkway. Yancey County, which includes the largest portion of the nonattainment area, has 454,640 Daily VMT and contributes 0.62% of the commuters that drive to Buncombe County to work each day. This pattern shows that the Black Mountains above 4000 feet nonattainment area should not be expanded to include wider area.

Growth Rates And Patterns:

Population growth within the Black Mountains is projected to be negligible. Growth in surrounding counties ranges from 5-15%.

Meteorology:

The violating ridge top monitors are located above the nocturnal boundary layer and are near or within the subsidence inversion at the top of the daytime mixed layer. Because of this stratification, the air at elevations above 4000 feet is characterized by long range transport and has different diurnal patterns than locations within the valleys. Backward trajectories in Appendix M show that air parcels on days with ozone at or above 0.076 ppm originate from areas outside the region including the western Piedmont of North Carolina, Tennessee, and the Ohio River Valley, suggesting that the inclusion of elevations below 4000 feet in the nonattainment area would have little impact on the violating monitors located above 4000 feet.

Geography / Topography:

The Mount Mitchell ozone monitor is considered a high-elevation or ridge top monitor. Much like all the other ridge top ozone monitors in Western North Carolina, Mount Mitchell does not have a normal diurnal ozone response profile similar to ozone monitors in the valleys of the Mountains and throughout the balance of the Piedmont, Sandhills, and Coastal Plains. Instead of recording exceedances of the 8-hour ozone standard during the middle of the afternoon when ozone production and photochemistry is at a maximum, the ozone exceedances at Mount Mitchell and other ridge top monitors occur during the nighttime hours. This timing of the exceedances is indicative of transport and not local generation of ozone, since the ozone chemistry stops once the sun goes sets. Figure 16 demonstrates a typical comparison between a mountain ridge top monitor (red line), a mountain valley monitor (blue), and a large metropolitan area monitor (yellow).

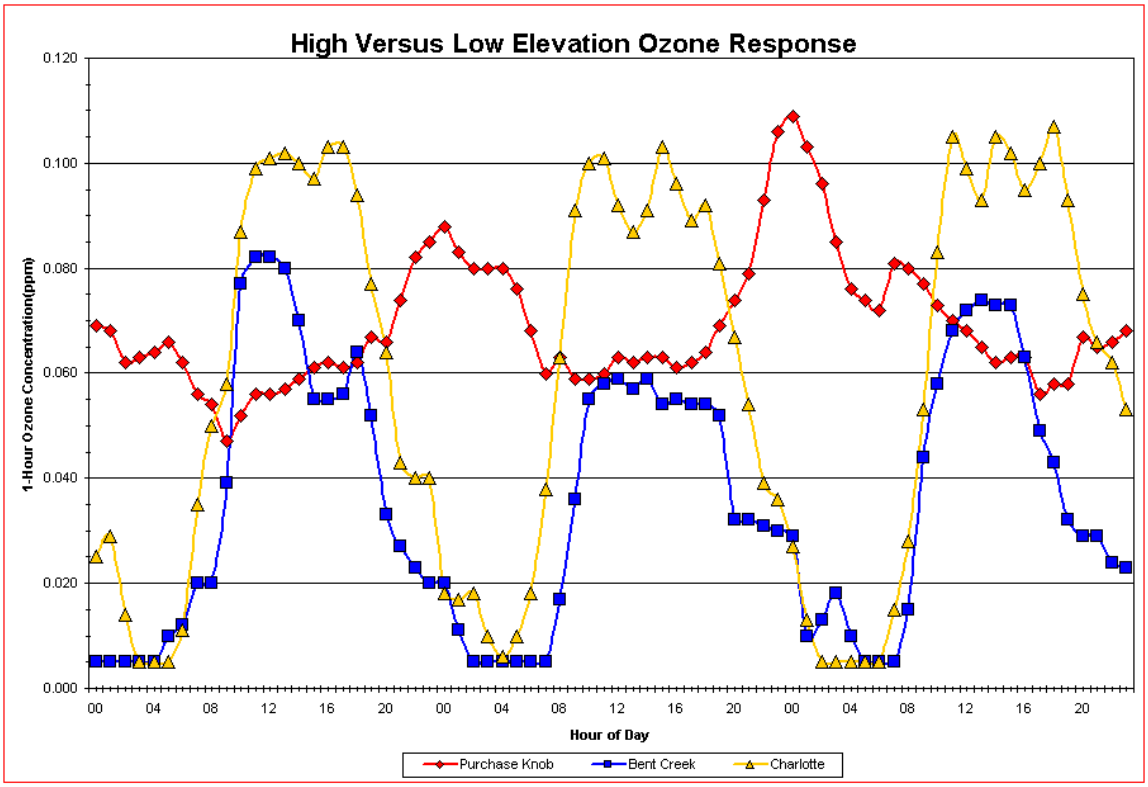

Figure 16: Diurnal Ozone Profile Comparison (Ridge Top, Valley, and Large Metropolitan Sites)

Jurisdictional Boundaries:

Buncombe County is one of the counties in the Mountain Area Early Action Compact (EAC) under the 1997 8-hour standard. The recommended nonattainment area is defined by the elevation of 4000 feet in the counties where the Black Mountains are located (Buncombe, McDowell, and Yancey). These counties have not previously been designated nonattainment.

Level of Control of Emission Sources:

Buncombe County, which encompasses the western portion of the recommended nonattainment area, has an OBD-based I/M program. McDowell and Yancey counties do not have an OBD-based I/M program, but annual visual inspection of emissions equipment is required. Other Federal and state (North Carolina and surrounding states) mobile and point strategies to reduce emissions will have a much greater impact in reducing ozone levels below the NAAQS above 4000 feet.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Hickory-Lenoir-Morganton Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Alexander, Burke, Caldwell, and Catawba Counties

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

The Unifour Metropolitan Planning Organization Planning Boundary within Burke and Caldwell Counties, and the whole of Catawba and Alexander Counties

Discussion:

Point and mobile emissions are sparse outside the Metropolitan Planning Organization (MPO) boundary within in western Burke and Caldwell Counties. Additionally, population density is substantially lower in the same area compared to areas within the MPO. An analysis of trajectories shows little impact from western Burke and Caldwell Counties on high ozone days. Thus, we recommend that areas outside the MPO boundaries in western Caldwell and Burke Counties be designated attainment.

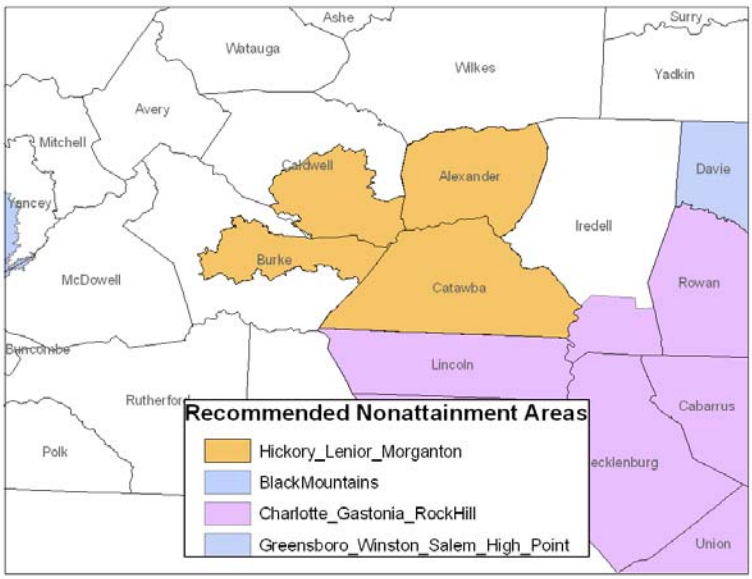

Figure 17: Recommended Nonattainment Area.

Air quality data:

There are two monitoring sites located in the Hickory-Lenoir-Morganton MSA, one in Lenoir in Caldwell County and one in Taylorsville in Alexander County. The Taylorsville site has a marginal violation at 0.076 ppm, while the Lenoir site is under the NAAQS at 0.075 ppm. A site close to the western border of Burke county in Linville is well under the NAAQS, at 0.067 ppm. A wind analysis suggests that on the majority days with higher ozone at these monitors, Charlotte is having the most impact on these sites. There are also a number of days when these sites are impacted by transport from the west and northwest, and that pollution comes over the mountains and mixes down into the valleys where the monitors are located. For these reasons, we recommend a smaller area than the full MSA.

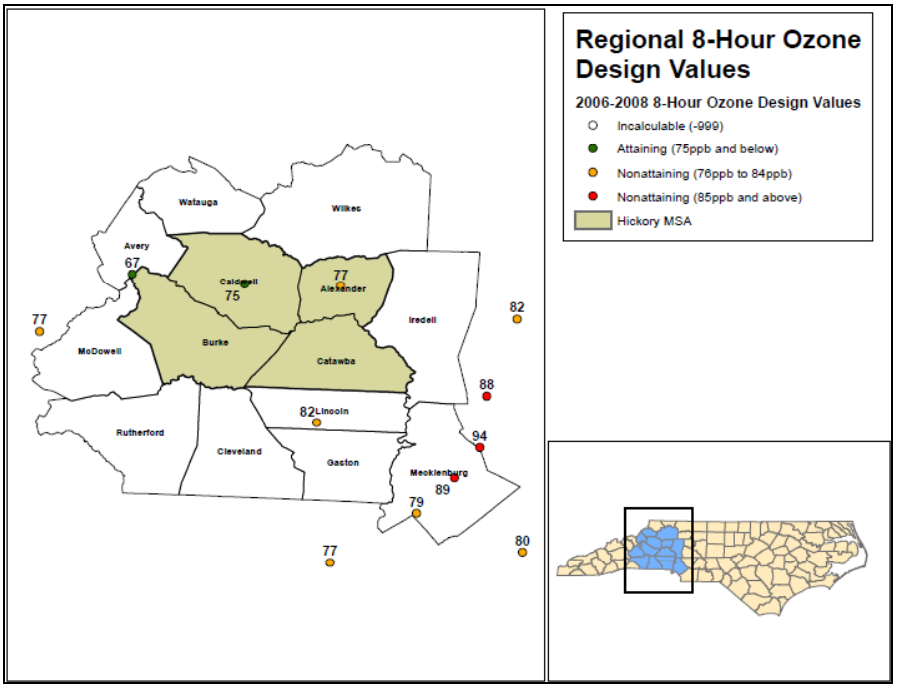

Figure 18: Unifour Regional 2006-2008 8-Hour Ozone Design Values Map (Please Note That All Design Value Concentrations Presented Above Are In Parts Per Billion (ppb) To Conserve Space On The Map. 76 ppb = 0.076 ppm.)

Table 6: Hickory Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Unifour	Waggin Trail	37-003-0004	0.080	0.076	0.081	0.076	0.079	0.077
	Lenoir	37-027-0003	0.075	0.076	0.077	0.072	0.076	0.075

Emissions Data:

There are no significant point sources in western Burke and Caldwell counties, outside the MPO boundary. Hence, the recommended nonattainment boundary should not include areas outside the MPO boundary in western Burke and Caldwell Counties.

Population Density And Degree Of Urbanization:

As of July 2007 estimates, there are 153,404 people in Catawba County, 88,439 people in Burke County, 79,376 in Caldwell County, and 36,656 in Alexander County. North Carolina's recommended nonattainment boundary captures 318,837 people, of the total 357,875 people living in the four county MSA, or 89 percent of the population is represented in the MPO planning boundary. In the recommended partial counties (Burke and Caldwell), the MPO boundary captures 69.8% or 61,466 people and 84.8% or 67,311 people in Burke and Caldwell counties, respectively. Population density is much lower outside the MPO boundary in western Burke and Caldwell Counties (see Appendix I).

Traffic And Commuting Patterns:

Caldwell County has 1,699,900 Daily VMT and contributes 8.45% of the commuters that drive to Catawba County to work each day. Daily VMT are expected to increase to 1,904,030 in

2020. Burke County has 2,685,230 Daily VMT and contributes 8.83% of the commuters that drive to Catawba County to work each day. Daily VMT are expected to increase to 2,938,960 in 2020. The amount of daily commuters originating from western Burke and Caldwell counties and outside the MPO is small.

Growth Rates And Patterns:

Population growth from 2000-2007 is 4.7%, well below the statewide average of 8.3%. Catawba county population is projected to grow 11.5% from 2000-2010, and 12.6% from 2010 to 2020. Burke county population is projected to decline 0.9% from 2000-2010, and 0.7% from 2010 to 2020. Caldwell county population is projected to grow 3.2% from 2000-2010, and 2.0% from 2010 to 2020. Alexander county population is projected to grow 11.9% from 2000-2010, and 8.0% from 2010 to 2020.

Meteorology:

On the days when these monitors exceed the 8-hour standard, they appear to be measuring pollution from several other areas, mainly Charlotte and the Triad but also including eastern Tennessee, and the Ohio River Valley. As the pollution in these areas is reduced, these monitors should observe lower ozone levels. Currently, the design value for the Lenoir monitor is 0.075 ppm and the Taylorsville monitor is 0.076 ppm. The trajectory analysis included in Appendix K shows that the last 5-6 hours of the trajectories cross eastern portions of the 4 counties. Very few trajectories pass through western Burke and Caldwell Counties on their way to the monitors.

Geography / Topography:

The mountains in the western part of the Burke and Caldwell Counties need to be factored in to the nonattainment designation. These areas coincide with areas within the Pisgah National Forest.

Jurisdictional Boundaries:

The western parts of Burke and Caldwell Counties are within the Pisgah National Forest. The recommended nonattainment area matches the MPO boundaries in Burke and Caldwell Counties. Alexander, Burke, Caldwell and Catawba counties make up the Unifour Early Action Compact (EAC) Area under the 1997 8-hour ozone.

Level of Control of Emission Sources:

The majority of the emissions are generated from mobile sources. An OBD-based inspection and maintenance program is active in Catawba, Caldwell, and Burke Counties. Although Alexander County does not have and OBD based I/M program, annual visual inspection of emission equipment is required. Other Federal and state mobile strategies will also reduce these emissions. Low sulfur diesel and gasoline is required statewide. The Marshall Steam Station in Catawba County is now required to reduce the NOx emissions to meet the NOx SIP Call and the Clean Smokestacks Act.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an

example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Charlotte-Gastonia-Rock Hill Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

The whole counties of Iredell, Mecklenburg, Lincoln, Gaston, Cleveland, Union, Anson, Stanly, Cabarrus, and Rowan.

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

The whole counties of Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan and Union and the partial county of Iredell.

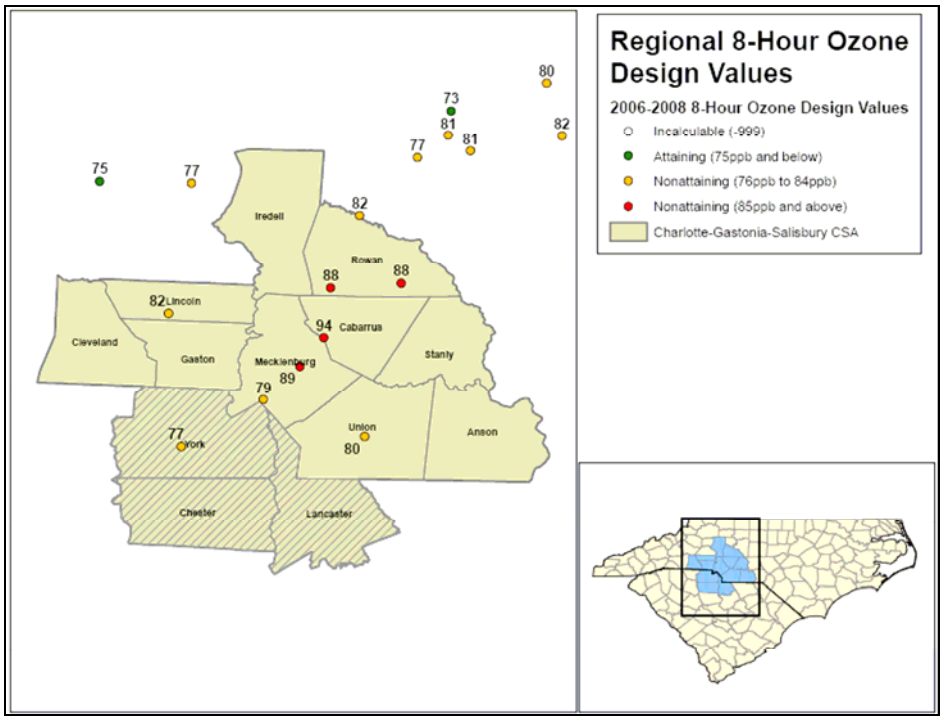

Figure 19: Metrolina NC Regional 2006-2008 8-Hour Ozone Design Values Map

Table 7: Charlotte/Metrolina Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Metrolina	County Line	37-119-1009	0.090	0.093	0.096	0.093	0.093	0.094
	Enochville	37-159-0022	0.088	0.089	0.095	0.082	0.090	0.088
	Rockwell	37-159-0021	0.086	0.085	0.096	0.084	0.089	0.088
	Garinger	37-119-0041	0.088	0.091	0.093	0.085	0.090	0.089
	Crouse	37-109-0004	0.082	0.082	0.085	0.079	0.083	0.082
	Monroe	37-179-0003	0.082	0.080	0.082	0.080	0.081	0.080
	Arrowood	37-119-1005	0.085	0.078	0.087	0.073	0.083	0.079
	York (South Carolina)	45-091-0006	0.079	0.078	0.080	0.075	0.079	0.077

The monitors in the Charlotte-Gastonia-Rock Hill MSA currently measure the highest ozone values in the State. North Carolina recommends, relative to the North Carolina counties, that the whole counties of Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan and Union and the partial county of Iredell be designated as nonattainment. The counties not recommended and the partial county recommendations are discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Iredell County

This is an MiSA county within the Charlotte-Gastonia-Salisbury CSA, but it does not have a monitor located in the county. This is a high commuter county into the Charlotte area along the I-77 corridor. The northern portion of the county is rural, so the recommendation is for a smaller area than the entire county.

The recommendation is that the two townships in the southern portion of Iredell County, Coddle Creek and Davidson Townships, as defined by the 2000 Census, be designated as nonattainment.

Air Quality Data:

As shown in Figure 19 above, this area has 7 monitors with design values ranging from 0.079 ppm to 0.094 ppm. The monitor located nearest Iredell County is in neighboring Rowan County in Enochville with a design value of 0.088 ppm. However, on days when this monitor has the highest readings, the winds are generally out of the southwest, indicating that the emissions from southern Iredell County are not likely to contribute to the Enochville monitor's high ozone levels.

Emissions Data:

Based on 2005 emissions inventories, Iredell County has 2012.88 tons per year of point-source NOx and the county has 768.55 tons per year of point-source VOC. There are some industrial sources in the county, including a natural gas pumping station, which is subject to the NOx SIP call.

Population Density and Degree of Urbanization:

122,660 people live in Iredell County, 39,885 people live in the two townships recommended as nonattainment. The northern portion of Iredell County has low population density, with 2 tracts containing 50-100 people per square mile, and 5 tracts with 100-250 people per square mile. The northern portion also includes Statesville, with 1 tract containing 250-500 people per square mile, and 5 small tracts with 500-2500 people per square mile. The portion that is recommended to be designated nonattainment has 1 tract with 250-500 people per square mile, and 2 small tracts with 500-1000 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:

Iredell County has 5,208,390 Daily VMT, according to 2007 data. Iredell County contributes 2.02 percent of the commuters who drive in to Mecklenburg County to work each day. Iredell ranks number 5 in the commuting counties into Mecklenburg. These VMT are expected to increase to 6,236,920 by 2020.

Growth Rates and Patterns:
The population in Iredell County is expected to grow between 2000 and 2010, with a total increase of 32.0%.

Meteorology:
Winds across Iredell County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will likely impact the Triad area. On days when the winds are from the north, the emissions will add to the Charlotte area's pollution.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The existing 1997 8-hour ozone standard nonattainment area includes the southern portion of Iredell County, which is also included in North Carolina's recommendation as nonattainment for the new 8-hour ozone standard.

Level of control of emissions sources:
Iredell County currently has 2 major point sources for NOx and one major point source for VOCs. One fuel pumping station is subject to the NOx SIP Call. However, controls for additional large point sources are handled on a case-by-case basis. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Iredell County currently has an OBD based I/M program and low-sulfur gasoline is required statewide.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Cleveland County

This is an MiSA county within the Charlotte-Gastonia-Salisbury CSA, but it does not have a monitor located in the county. This is a mostly rural county with a low impact from commuting traffic into the urbanized core of the CSA. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data*:*
As shown in Figure 19 above, this area has 7 monitors with design values ranging from 0.079 ppm to 0.094 ppm. The monitor located nearest Cleveland County is in neighboring Lincoln County in Crouse with a design value of 0.082 ppm. However, on days when this monitor has the highest readings with winds generally out of the southwest, Cleveland County has no additional impact on the air quality within the CSA.

Emissions Data*:*
Based on 2005 emissions inventories, Cleveland County has 184.87 tons per year of point-source NOx and the county has 793.60 tons per year of point-source VOC. There are two major point sources in the county (1 each for NOx and VOC).

Population Density and Degree of Urbanization*:*
96,408 people live in Cleveland County. The northern portion of Cleveland County has low population density, with 9 tracts of less than 250 people per square mile. Two small tracts of 250-1000 people per square mile and 3 smaller tracts of 1000-2500 people per square mile are in the southeastern portion of the county. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns*:*
Cleveland County has 2,727,700 Daily VMT, according to 2007 data. Cleveland County contributes less than 1 percent of the commuters who drive in to Mecklenburg County to work each day. These VMT are expected to increase to 3,087,880 by 2020.

Growth Rates and Patterns*:*
The population in Cleveland County is expected to grow slightly between 2000 and 2010, with a total increase of 0.8%.

Meteorology:
Winds across Cleveland County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will likely not impact the air quality within the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The existing 1997 8-hour ozone standard nonattainment area does not include Cleveland County and it is not included in North Carolina's recommendation as nonattainment for the new 8-hour ozone standard.

Level of control of emissions sources*:*
Cleveland County currently has 1 major point source for NOx and one major point source for VOCs. However, these sources are non-EGUs and controls for each facility will be handled on a case-by-case basis. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Cleveland County currently has an OBD based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to

control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Anson County

This is an MSA county within the Charlotte-Gastonia-Salisbury CSA, but it does not have a monitor located in the county. This is a mostly rural county with a low impact from commuting traffic into the urbanized core of the CSA. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data*:*

As shown in Figure 19 above, this area has 7 monitors with design values ranging from 0.079 ppm to 0.094 ppm. The monitor located nearest Anson County is in neighboring Union County in Monroe with a design value of 0.080 ppm. However, on days when this monitor has the highest readings with winds generally out of the southwest, Anson County has no additional impact on the air quality within the CSA.

Emissions D*ata:*

Based on 2005 emissions inventories, Anson County has 171.82 tons per year of point-source NOx and the county has 58.61 tons per year of point-source VOC. There are no major point sources located within the county.

Population Density and Degree of Urbanization*:*

25,321 people live in Anson County. The northern portion of Anson County is a largely rural county with no tracts having a population density fewer than 250 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns*:*

Anson County has 829,870 Daily VMT, according to 2007 data. Anson County contributes less than half of 1 percent of the commuters who drive in to Mecklenburg County to work each day. These VMT are expected to increase to 944,060 by 2020.

Growth Rates and Patterns*:*

The population in Anson County is expected to decrease slightly between 2000 and 2010, with a total decrease of 1.7%. A further decrease is expected from 2010 to 2020, falling by 4.3%.

Meteorology:

Winds across Anson County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will have no impact on the CSA.

Geography/Topography:

There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:

The existing 1997 8-hour ozone standard nonattainment area does not include Anson County and it is not included in North Carolina's recommendation as nonattainment for the new 8-hour ozone standard.

Level of control of emissions sources*:*
There are no major point sources to consider controls within the county. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Anson County does not currently have an OBD based I/M program, but requires an annual visual inspection of emissions equipment. Low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Stanly County
This is an MiSA county within the Charlotte-Gastonia-Salisbury CSA, but it does not have a monitor located in the county. This is a mostly rural county with a low impact on commuting traffic into the urbanized core of the CSA. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data*:*
As shown in Figure 19 above, this area has 7 monitors with design values ranging from 0.079 ppm to 0.094 ppm. The monitor located nearest Stanly County is in neighboring Rowan County in Rockwell with a design value of 0.088 ppm. However, on days when this monitor has the highest readings with winds generally out of the southwest, Stanly County has no additional impact on the air quality within the CSA.

Emissions Data*:*
Based on 2005 emissions inventories, Stanly County has 363.74 tons per year of point-source NOx and the county has 340.35 tons per year of point-source VOC. There is one major point source of NOx emissions in Stanly County.

Population Density and Degree of Urbanization*:*
58,277 people live in Stanly County. The northern portion of Stanly County is a largely rural county with 7 tracts having a population density fewer than 250 people per square mile, 2 tracts with a density of 250-500 people per square mile and 1 tract each of 500-1000 and 1000-2500 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns*:*
Stanly County has 1,418,410 Daily VMT, according to 2007 data. Stanly County contributes less than 1 percent of the commuters who drive in to Mecklenburg County to work each day. These VMT are expected to increase to 1,495,570 by 2020.

Growth Rates and Patterns*:*
The population in Stanly County is expected to increase slightly between 2000 and 2010, with a total decrease of 2.3%.

Meteorology:
Winds across Stanly County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will have no additional impact on the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The existing 1997 8-hour ozone standard nonattainment area does not include Stanly County and it is not included in North Carolina's recommendation as nonattainment for the new 8-hour ozone standard.

Level of control of emissions sources:
There is one major point source to consider within the county, but this source is not subject to the NOx SIP Call. Therefore, controls are handled on a per-case basis. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Stanly County does not currently have an OBD based I/M program, but requires an annual visual inspection of emissions equipment. Low-sulfur gasoline is required statewide.

> *DENR's ability to control sources throughout the state:* The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Greensboro-Winston-Salem-High Point Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Surry, Stokes, Rockingham, Caswell, Yadkin, Forsyth, Guilford, Alamance, Davie, Davidson and Randolph Counties

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Forsyth, Guilford, Alamance, Davidson, Caswell, Davie, Rockingham and the partial counties of Randolph and Orange

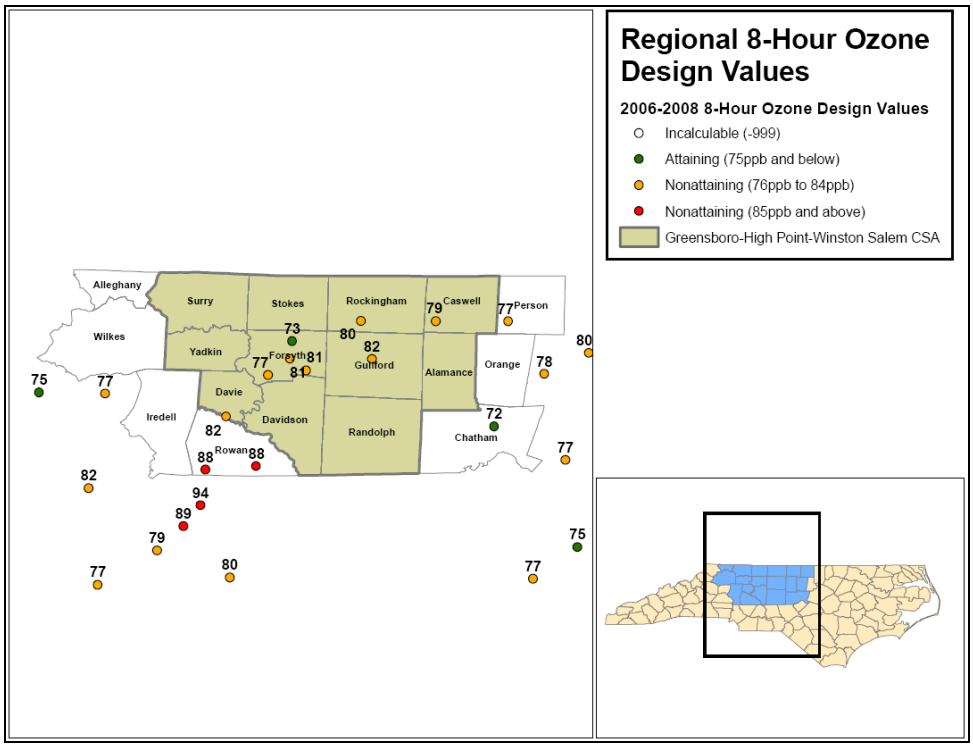

Figure 20: Triad NC Regional 2006-2008 8-Hour Ozone Design Values Map

Table 8: Greensboro-Winston-Salem-High Point (Triad) Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Triad	Cooleemee	37-059-0002	0.084	0.080	0.085	0.081	0.083	0.082
	Mendenhall	37-081-0013	0.082	0.080	0.086	0.081	0.082	0.082
	Union Cross	37-067-1008	0.080	0.082	0.083	0.078	0.081	0.081
	Hattie Ave.	37-067-0022	0.074	0.082	0.082	0.081	0.079	0.081
	Bethany	37-157-0099	0.078	0.075	0.082	0.084	0.078	0.080
	Cherry Grove	37-033-0001	0.076	0.075	0.082	0.080	0.077	0.079
	Clemmons	37-067-0030	0.075	0.077	0.078	0.078	0.076	0.077
	Shiloh Church	37-067-0028	0.078	0.067	0.076	0.077	0.073	0.073

The monitors in the Greensboro/ Winston Salem/High Point CSA currently measure the second highest ozone values in the State. North Carolina recommends that the whole counties of Forsyth, Guilford, Alamance, Davidson, Caswell, Davie, Rockingham and the partial counties of Randolph and Orange be designated as nonattainment. Counties for which recommendations differ from EPA's presumptive boundaries are discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Stokes County

This is an MSA county within the Greensboro-Winston Salem-High Point CSA, but there is no monitor located here. This is a rural county, so the recommendation is that no portion of the county be designated nonattainment.

Air Quality Data:

As shown in Figure 20 above, the Triad area has 8 monitors with design values ranging from 0.073 ppm to 0.082 ppm. While Stokes County has no monitor, the nearest is located in Forsyth County with a design value of 0.073, and the second nearest monitor is located in Rockingham County with a design value of 0.080.

Emissions Data:

Based on 2002 emissions inventories, Stokes County has 21017.08 tons per year of NOx and the county has 95367.89 tons per year of VOC (anthropogenic only). The large source of NOx emissions are from the Duke Energy Belews Creek facility, which has reduced and will continue to reduce the NOx emissions to about 31 tons per day under the NOx SIP call.

Population Density and Degree of Urbanization:

44,711 people live in Stokes County. The county in general has a relatively low population density, with most tracts having 250 or fewer people per square mile. Two small tracts have a population density of 250-500 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:

Stokes County has 889,040 Daily VMT and contributes 6.03 percent of the commuters that drive to Forsyth County to work each day. These VMT are expected to increase to 1,039,980 in 2020.

Growth Rates and Patterns:

The population in Stokes County is expected to grow slightly between 2000 and 2010, with a total increase of 5% or less.

Meteorology:

Winds across Stokes County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of the CSA or North Carolina. The exception is in the case of northerly winds.

Geography/Topography:

There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Stokes County is one of several counties in the Triad Early Action Compact area under the 1997 8-hour ozone standard. The counties in the Triad EAC were designated attainment April 15, 2008.

Level of control of emissions sources:
Currently there is one major point source in Stokes County to control and this facility is subject to the NOx SIP call. The remaining NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Stokes County currently has an OBD-based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The OBD-based I/M program was adopted in 1999.

Yadkin County

This is an MSA county within the Greensboro-Winston Salem-High Point CSA, but there is no monitor located here. This is a rural county, so the recommendation is that no portion of the county be designated nonattainment.

Air Quality Data:
As shown in Figure 20 above, this area has 8 monitors with design values ranging from 0.073 ppm to 0.082 ppm. There is no monitor in Yadkin County, but the closest monitor is located in Forsyth County and has a design value of 0.077 ppm.

Emissions Data:
There are no large point sources in the county.

Population Density and Degree of Urbanization:
36,348 people live in Yadkin County. The county in general has a relatively low population density, with most tracts having 100 or fewer people per square mile. Two small tracts have a population density of 100-250 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Yadkin County has 1,381,260 Daily VMT as of 2007. Yadkin County contributes 3.23 percent of the commuters that drive to Forsyth County to work each day. These VMT are expected to increase to 1,635,170 by 2020.

Growth Rates and Patterns:
The population in Yadkin County is expected to grow moderately between 2000 and 2010,

with a total increase of 6.1%.

Meteorology:
Winds across Yadkin County are climatologically from the southwest. With this climatological wind pattern, the majority of the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Yadkin County is one of several counties in the Triad Early Action Compact area under the 1997 8-hour ozone standard. The counties in the Triad EAC were designated attainment April 15, 2008.

Level of control of emissions sources:
There are no major point sources in the county needing control. The remaining NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Yadkin County currently has no OBD-based I/M program, but it has an annual safety inspection program requiring a visual check of emissions control devices for tampering. Low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Surry County

This is not an MSA county but rather a Micropolitan Statistical Area (MiSA) within the Greensboro-High Point-Winston Salem CSA and there is no monitor located here. This is a rural county, so the recommendation is that no portion of the county be designated nonattainment.

Air Quality Data:
As shown in Figure 20 above, this area has 8 monitors with design values ranging from 0.073 ppm to 0.082 ppm. There is no monitor in Surry County, but the closest monitor is located in Forsyth County and has a design value of 0.073 ppm.

Emissions Data:
Based on 2002 point source emissions inventories, Surry County has 326.49 tons per year of NOx and the county has 1222.35 tons per year of VOC. The largest point sources in Surry County are the True Textiles, Weyerhaeuser Company and Vaughan-Bassett Furniture Company manufacturing facilities.

Population Density and Degree of Urbanization:
71,219 people live in Surry County. The entire County has fairly low population density, with 2 tracts containing 50-100 people per square mile, 6 tracts containing 100-250 people per square mile, 3 small tracts containing 250-1000 people per square mile and one minor tract containing 1000-2500 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Surry County has 2,396,290 Daily VMT. Surry County contributes 2.54 percent of the commuters that drive to Forsyth County to work each day. These VMT are expected to decrease to 2,359,680 by 2020.

Growth Rates and Patterns:
The population in Surry County is expected to grow between 2000 and 2010, with a total increase of 4.0%.

Meteorology:
Winds across Surry County are climatologically from the southwest. With this climatological wind pattern, the northwestern portion of the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Surry County is one of several counties in the Triad Early Action Compact area under the 1997 8-hour ozone standard. The counties in the Triad EAC were designated attainment April 15, 2008.

Level of control of emissions sources:
As discussed there are 3 non-EGU major point sources in Surry County. Controls for non-EGUs are regulated on a case-by-case basis. The remaining NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Surry County currently has an OBD-based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Randolph County

This is an MSA county within the Greensboro-Winston Salem-High Point CSA, but it does not have a monitor and is a mostly rural county. Therefore, North Carolina's recommendation is for

a smaller area of the county to be designated as nonattainment.

The recommendation is that the High Point Metropolitan Planning Organization portion of Randolph County be designated as nonattainment.

Air Quality Data
As shown in Figure 20 above, this area has 8 monitors with design values ranging from 0.073 ppm to 0.082 ppm. The nearest monitor to this region is in southeastern Forsyth County with a design value of 0.081 ppm.

Emissions Data:
Based on 2002 point-source emissions inventories, Randolph County has 55.09 tons per year of NOx and the county has 747.49 tons per year of VOC. The largest point source (VOC emissions) in the county is the Oliver Rubber Company.

Population Density and Degree of Urbanization:
130,454 people live in Randolph County. Much of the County has low population density, with 10 tracts of 250 people or less per square mile, 5 tracts containing 250-500 people per square mile, 3 small tracts of 500-1000 people per square mile and 5 smaller tracts containing 1000-2500 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Randolph County has 3,742,370 Daily VMT. Randolph County contributes 7.54 percent of the commuters that drive to Guilford County to work each day. These VMT are expected to increase to 4,253,460 by 2020.

Growth Rates and Patterns:
The population in Randolph County is expected to grow moderately between 2000 and 2010, with a total increase of 9.2%.

Meteorology:
Winds across Randolph County are climatologically from the southwest. With this climatological wind pattern, the portion of the county to be excluded from designation as nonattainment would not serve as an upwind sector that would routinely have an impact on air quality in the urban portion of the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Randolph County is one of several counties in the Triad Early Action Compact area under the 1997 8-hour ozone standard. The counties in the Triad EAC were designated attainment April 15, 2008. The High Point Metropolitan Planning Organization boundary as of March 12, 2009, defines the portion of Randolph County that is recommended to be designated nonattainment.

Level of control of emissions sources:
As discussed there are 3 non-EGU major point sources (VOC) in Randolph County with no major NOx point sources. Controls for non-EGUs are regulated on a case-by-case basis. The remaining NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Randolph County currently has an OBD-based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Orange County

This is not a county within the Triad CSA; however, a portion of the county is part of the Burlington-Graham Metropolitan Planning Organization. In order to avoid duplication of transportation conformity exercises, this portion of Orange County is recommended to be considered part of the Triad nonattainment area. Because the bulk of the county is included in the Raleigh-Durham-Cary CSA, the nine factors are addressed in the Raleigh-Durham-Cary Area discussion rather than here.

<u>The recommendation is that the Burlington-Graham Metropolitan Planning Organization portion of Orange County be designated as nonattainment for the Greensboro-Winston-Salem-High Point Nonattainment Area for the purposes of transportation conformity.</u>

Raleigh-Durham-Cary Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Wake, Johnston, Harnett, Orange, Durham, Chatham, Person, Granville and Franklin Counties.

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Wake, Orange, Durham, Person, Granville, and Franklin counties and the partial counties of Chatham and Johnston.

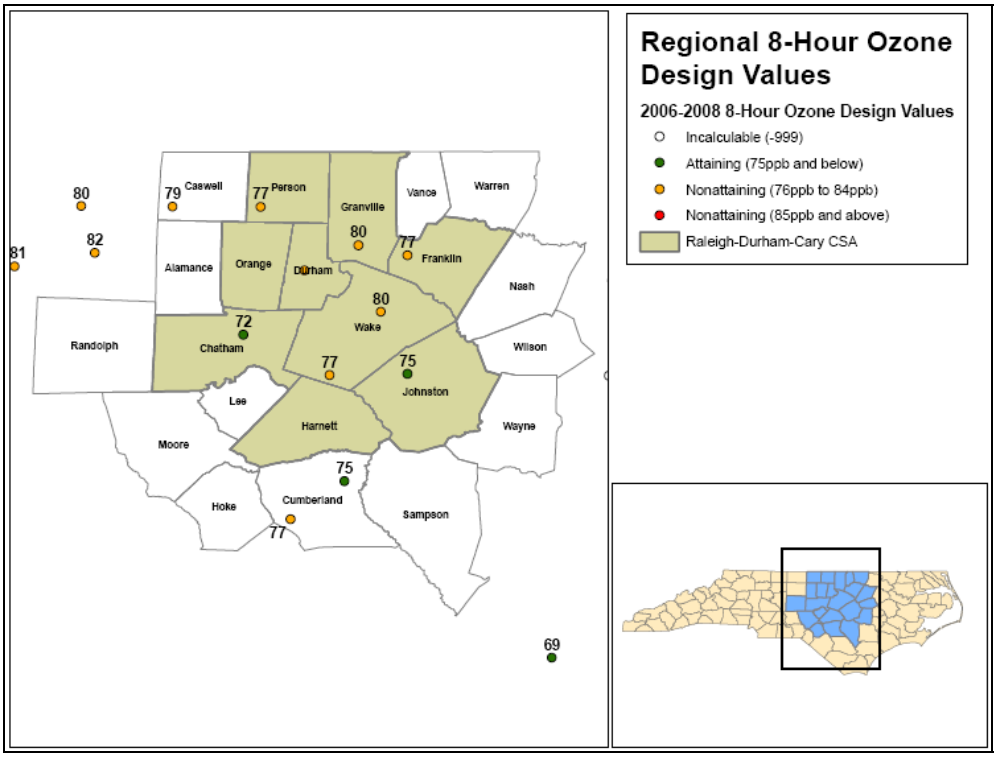

Figure 21: Triangle NC Regional 2006-2008 8-Hour Ozone Design Values Map

Table 9: Raleigh-Durham-Cary (Triangle) Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Triangle	Millbrook	37-183-0014	0.082	0.078	0.084	0.078	0.081	0.080
	Butner	37-077-0001	0.085	0.076	0.083	0.081	0.081	0.080
	Durham Armory	37-063-0015	0.076	0.078	0.080	0.076	0.078	0.078
	Franklinton	37-069-0001	0.080	0.074	0.080	0.078	0.078	0.077
	Bushy Fork	37-145-0003	0.079	0.075	0.079	0.078	0.077	0.077
	W. Johnston	37-101-0002	0.083	0.072	0.078	0.076	0.077	0.075
	Fuquay-Varina	37-183-0016	0.085	0.073	0.080	0.078	0.079	0.077
	Pittsboro	37-037-0004	0.079	0.070	0.075	0.072	0.074	0.072

The monitors in the Raleigh-Durham-Cary CSA currently measure the third highest ozone values in the State. North Carolina recommends that the whole counties of Wake, Orange, Durham, Person, Granville, and Franklin counties and the partial counties of Chatham and Johnston be designated as nonattainment. In addition North Carolina recommends that portions of Orange County be associated with two different nonattainment areas for the purposes of transportation conformity. The counties not recommended and the partial county recommendations are discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Harnett County

This is an MiSA county within the Raleigh-Durham-Cary CSA, but it does not have a monitor located in the county. This is a mostly rural county with no large commuting impact on the urbanized core. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data

As shown in Figure 21 above, this area has 8 monitors with design values ranging from 0.072 ppm to 0.080 ppm. The monitor located nearest Harnett County is in neighboring Wake County in Fuquay with a design value of 0.077 ppm. Though the winds are climatologically out of the southwest, the limited emissions from this county are such that they do not significantly impact the air quality within the CSA.

Emissions Data:

Based on 2005 emissions inventories, Harnett County has 1.08 tons per year of point-source NOx and the county has 34.43 tons per year of point-source VOC. There are no major point sources of either NOx or VOC throughout the county.

Population Density and Degree of Urbanization:

91,085 people live in Harnett County as of 2000. The county is almost entirely rural, with no tracts with population density greater than 250 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:

Harnett County has 2,541,190 Daily VMT, according to 2007 data. Harnett County contributes 2.45 percent of the commuters who drive in to Wake County to work each day. These VMT are expected to increase moderately to 2,946,700 by 2020.

Growth Rates and Patterns:

The population is expected to increase by 23.5% by 2010 and by 20.1% between 2010 and 2020. These high percentages are exaggerated because of the small base population.

Meteorology:

Winds across Harnett County are climatologically from the southwest. Even with this climatological wind pattern, emissions from Harnett County are such that they have no significant impact on air quality degradation within the CSA.

Geography/Topography:

There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Harnett County is not included in any existing nonattainment area nor has it previously been designated nonattainment. The recommendation is that no portion within the county boundary be designated nonattainment.

Level of control of emissions sources:
Harnett County has no major point sources for NOx and VOC emissions. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Harnett County currently has an OBD-based I/M program and low-sulfur gasoline is required statewide.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Johnston County

This is an MSA county within the Raleigh-Durham-Cary CSA with an attaining monitor located in the more populated, far western portion of the county. Most of the eastern portion of Johnston County is rural, with the western portion commuting into Wake County. Therefore, North Carolina is recommending that a smaller portion than the entire county be designated as nonattainment.

<u>The recommendation is that the area within the Capital Area Metropolitan Planning Organization boundary be designated as nonattainment.</u>

Air Quality Data
As shown in Figure 21 above, this area has 8 monitors with design values ranging from 0.072 ppm to 0.080 ppm. The monitor located within the county currently has a design value of 0.075 ppm, which is attainment both for the previous and current 8-hour ozone standard.

Emissions Data:
Based on 2005 emissions inventories, Johnston County has 43.35 tons per year of point-source NOx and the county has 253.87 tons per year of point-source VOC. There are no major point sources of NOx or VOC.

Population Density and Degree of Urbanization:
121,965 people live in Johnston County as 2000, 60,605 of which live in the portion recommended for nonattainment. The eastern portion of the county is mostly rural with 7 tracts of 250 or fewer people per square mile and 1 small tract of 1000-2500 people. The area recommended for nonattainment is more urbanized with 4 tracts of population density between 100-500 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Johnston County has 5,225,390 Daily VMT, according to 2007 data. Johnston County contributes 6.56 percent of the commuters who drive in to Wake County to work each day, most of which live in the western portion of the county. These VMT are expected to increase to 6,131,270 by 2020.

Growth Rates and Patterns:
The population in Johnston County is expected to grow between 2000 and 2010, with a total increase of 40.1%. An increase of 31.1% is expected between 2010 and 2020.

Meteorology:
Winds across Johnston County are climatologically from the southwest. With this climatological wind pattern, the limited emissions from the county have no significant impact on the degradation of the air quality within the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The Capital Area Metropolitan Planning Organization includes the Wilders, O'Neal, Clayton, Cleveland, Pleasant Grove and Elevation Townships. These areas were part of a previous ozone nonattainment area that was redesignated as attainment December 26, 2007.

Level of control of emissions sources:
Johnston County currently has no major point source of NOx or VOCs. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Johnston County currently has an OBD-based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Chatham County

This is an MSA county within the Raleigh-Durham-Cary CSA with one attaining monitor located in the northwest portion of the county. This is a mostly rural county with a low impact on commuting traffic into the urbanized core of the CSA. Therefore, North Carolina is recommending a smaller portion than the entire county be designated as nonattainment.

<u>The recommendation is that the Baldwin, Center, New Hope and Williams Townships be designated as nonattainment.</u>

Air Quality Data:
As shown in Figure 21 above, this area has 8 monitors with design values ranging from 0.072 ppm to 0.080 ppm. The monitor located within Chatham County currently has the lowest design value of 0.072 ppm, which is in attainment for both the previous and current 8-hour ozone standards.

Emissions Data:
Based on 2005 emissions inventories, Chatham County has 2494.81 tons per year of point-source NOx and the county has 239.23 tons per year of point-source VOC. There are 2 major point sources of NOx emissions and 2 major point sources for VOC emissions. One of the point sources is Progress Energy's Cape Fear plant, which is subject to the NOx SIP Call.

Population Density and Degree of Urbanization:
49,329 people live in Chatham County, with 21,320 people living in the area recommended for nonattainment. The county is largely rural, with the area recommended for nonattainment having 3 tracts, all with 250 people or fewer per square mile. The western portion of the county has 1 small tract with 500-1000 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Chatham County has 1,906,160 Daily VMT, according to 2007 data. Chatham County contributes less than 1 percent of the commuters who drive in to Wake County to work each day. These VMT are expected to increase to 2,502,830 by 2020.

Growth Rates and Patterns:
The population in Chatham County is expected to increase between 2000 and 2010, with a total decrease of 27.3%. A further increase is expected from 2010 to 2020, growing by 22.3%.

Meteorology:
Winds across Chatham County are climatologically from the southwest. With this climatological wind pattern, only the emissions in the eastern portion of the county would have significant impact on the air quality within the CSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The Baldwin, Center, New Hope and Williams townships define the area recommended as the nonattainment boundary. These areas were part of a previous ozone nonattainment area that was redesignated as attainment December 26, 2007.

Level of control of emissions sources:
There are 2 major point sources of NOx and 2 major point sources for VOC emissions. The largest NOx point source is Progress Energy's Cape Fear plant, which as mentioned before, is subject to the NOx SIP Call and Clean Smokestacks Act. Other major non-EGU source controls are handled on a case-by-case basis. Additional NOx emissions are from mobile

sources, and the combined Federal and state control programs will address these emissions. Chatham County currently has an OBD-based I/M program. Low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Orange County

This is an MSA county within the Raleigh-Durham-Cary CSA; however, a portion of the county is under the jurisdiction of the Burlington-Graham Metropolitan Planning Organization. In order to avoid duplication of transportation conformity exercises, this portion of Orange County is recommended to be considered part of the Triad nonattainment area that has a higher design value. The remainder of the county is recommended to be considered part of the Raleigh-Durham-Cary nonattainment area because a portion of the remainder of the county is covered by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization. Because the county is included in the Raleigh-Durham-Cary CSA, the nine factors are addressed here for the whole county rather than duplicated in the Greensboro-Winston Salem-High Point discussion.

<u>The recommendation is that the Burlington-Graham Metropolitan Planning Organization portion of Orange County be designated as nonattainment for the Greensboro-Winston-Salem-High Point Nonattainment Area for the purposes of transportation conformity.</u>

Air Quality Data:

As shown in Figure 21 above, this area has 8 monitors with design values ranging from 0.073 ppm to 0.082 ppm. The monitor nearest to this region is in southwestern Person County and has a design value of 0.077 ppm.

Emissions Data:

Based on 2002 point-source emissions inventories, Orange County has 561.28 tons per year of NOx and the county has 152.08 tons per year of VOC. The largest point source of NOx emissions in the county is not within the Burlington-Graham MPO, but exists in the southeastern portion of the county at the University of North Carolina at Chapel Hill.

Population Density and Degree of Urbanization:

118,227 people live in Orange County. Much of the County has low population density, with 8 tracts of 250 people or less per square mile, 2 tracts containing 250-500 people per square mile, 2 small tracts of 500-1000 people per square mile, 6 smaller tracts containing 1000-2500 people per square mile, and 4 minor tracts containing more than 5000 people per square mile. Most of the densely populated tracts are located in the southeastern portion of Orange County. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Orange County has 3,921,360 Daily VMT. Orange County contributes 1.17% of the commuters that drive to Wake County daily and 9.92% of the commuters that drive to Durham County daily. These VMT are expected to increase to 4,653,190 by 2020. Orange County contributes 0.2% of the commuters that drive to Guilford County in the Greensboro-Winston Salem-High Point CSA daily and 0.05% to Forsyth County in the same CSA.

Growth Rates and Patterns:
The population in Orange County is expected to grow moderately between 2000 and 2010, with a total increase of 13.7%.

Meteorology:
Winds across Orange County are climatologically from the southwest. Most of the emissions within the county will have an impact on the northern portion of the Raleigh-Durham-Cary nonattainment.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
Orange County was part of a previous ozone nonattainment area that was redesignated as attainment December 26, 2007.

Level of control of emissions sources:
The major NOx point source in Orange County is the University of North Carolina, which is not within Burlington-Graham MPO. The remaining NOx emissions are from mobile sources and the combined Federal and state control programs will address these emissions. Orange County currently has an OBD based I/M program and low-sulfur gasoline is required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Fayetteville Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Cumberland and Hoke Counties

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Cumberland County

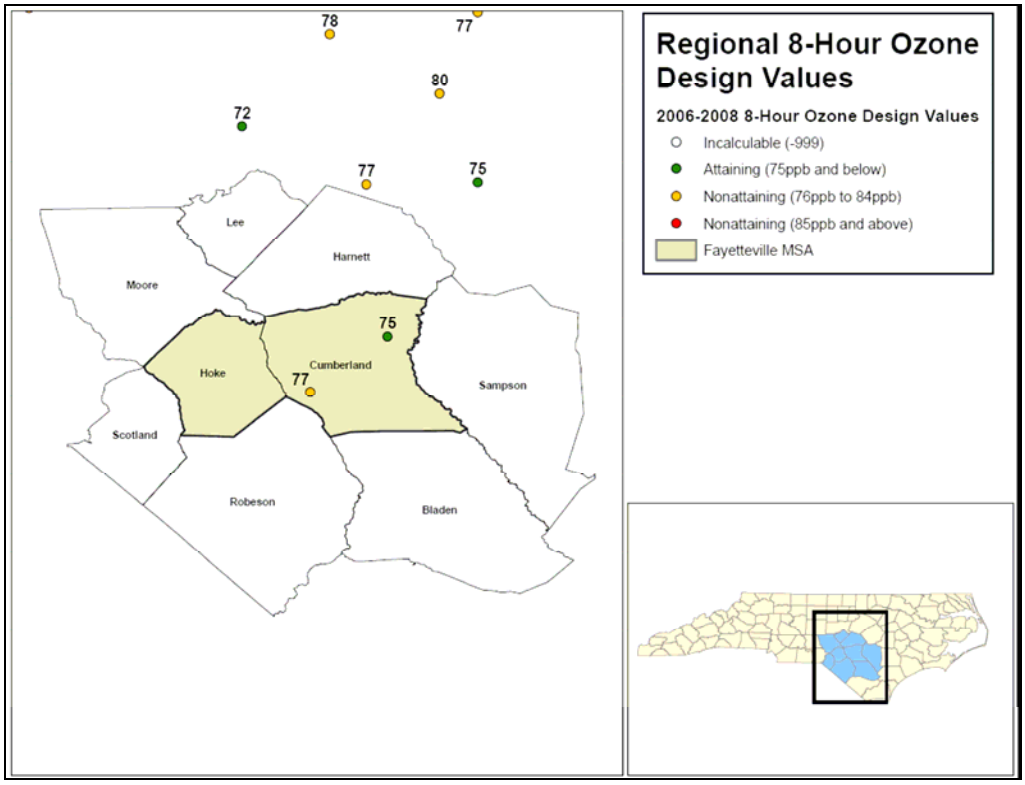

Figure 22: Fayetteville NC Regional 2006-2008 8-Hour Ozone Design Values Map

Table 10: Fayetteville Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Fayetteville	Wade	37-051-0008	0.084	0.072	0.080	0.075	0.078	0.075
	Golfview	37-051-1003	0.091	0.074	0.082	0.075	0.082	0.077

The monitors in the Fayetteville MSA currently measure the fourth highest ozone values in the State. North Carolina recommends that the whole county of Cumberland be designated as nonattainment. Cumberland County was one of four Early Action Compact areas under the 1997 8-hour ozone standard and was designated attainment April 15, 2008. The county not recommended is discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Hoke County

This is a Fayetteville MSA county, but it does not have a monitor located in the county.

This is a minor commuting county into the urbanized core and is also mostly rural. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data:
As shown in Figure 22 above, this area has 2 monitors with design values of 0.075 ppm to 0.077 ppm. The monitor located nearest Hoke County is in Cumberland County in Golfview with a design value of 0.077 ppm. Though the winds are climatologically out of the southwest, the limited emissions from this county are such that they do not significantly impact the air quality within the Fayetteville MSA.

Emissions Data:
Based on 2005 emissions inventories, Hoke County has 63.38 tons per year of point-source NOx and the county has 10.18 tons per year of point-source VOC. There are no major point sources of either NOx or VOC throughout the county.

Population Density and Degree of Urbanization:
33,646 people live in Hoke County as of 2000. The county is almost entirely rural, with 4 tracts with population density of 100 people or fewer per square mile. One small tract with population density of 500-1000 is in the center of the county. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Hoke County has 807,740 Daily VMT, according to 2007 data, with no major commuting contribution to the Fayetteville MSA. These VMT are expected to increase moderately to 1,140,050 by 2020.

Growth Rates and Patterns:
The population is expected to increase by 40.0% by 2010 and by 31.3% between 2010 and 2020. This growth rate is exaggerated by the small base population.

Meteorology:
Winds across Hoke County are climatologically from the southwest. Even with this climatological wind pattern, emissions from Hoke County are such that they have no significant impact on air quality degradation within the Fayetteville MSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The Fort Bragg Military Reservation extends from northwestern Cumberland Ccounty through the northern half of Hoke County. There is also the Fayetteville Metropolitan Planning Organization covering Cumberland County and a portion of southern Harnett County and eastern Hoke County. The previous 8-hour ozone nonattainment area North Carolina's recommended nonattainment area.

Level of control of emissions sources:
Hoke County has no major point sources for NOx and VOC emissions. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs

will address these emissions. Hoke County currently does not have an OBD-based I/M program, but a visual check of emissions equipment is required. Low-sulfur gasoline is also required statewide.

DENR's ability to control sources throughout the state: The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Greenville Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Pitt and Greene Counties

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

Unclassifiable, defer designation.

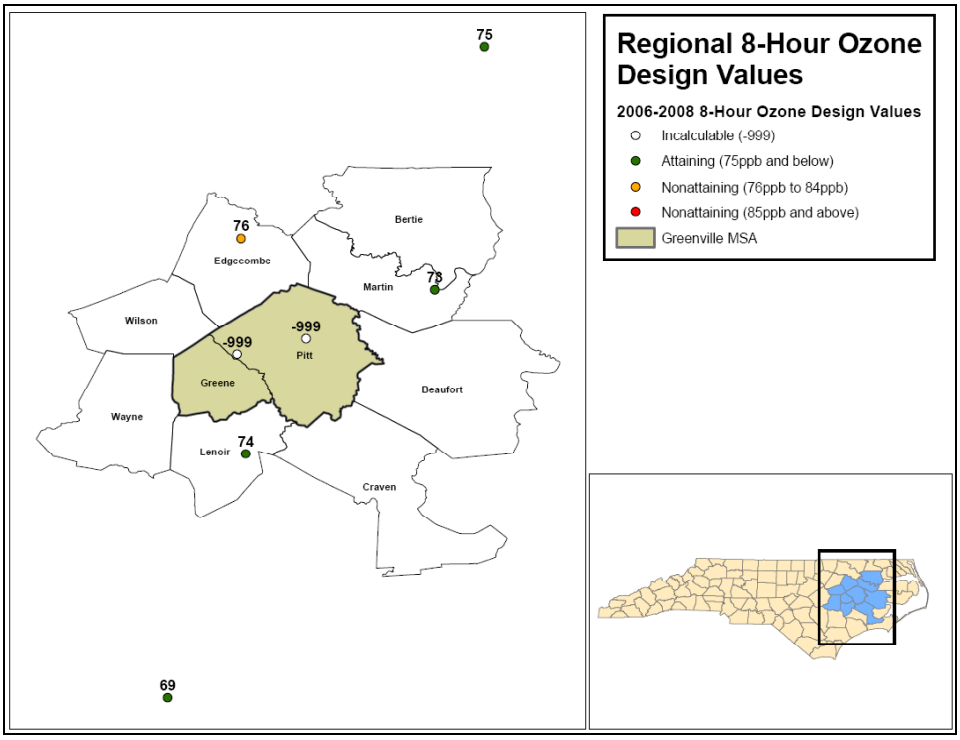

Figure 23: Greenville NC Regional 2006-2008 8-Hour Ozone Design Values Map

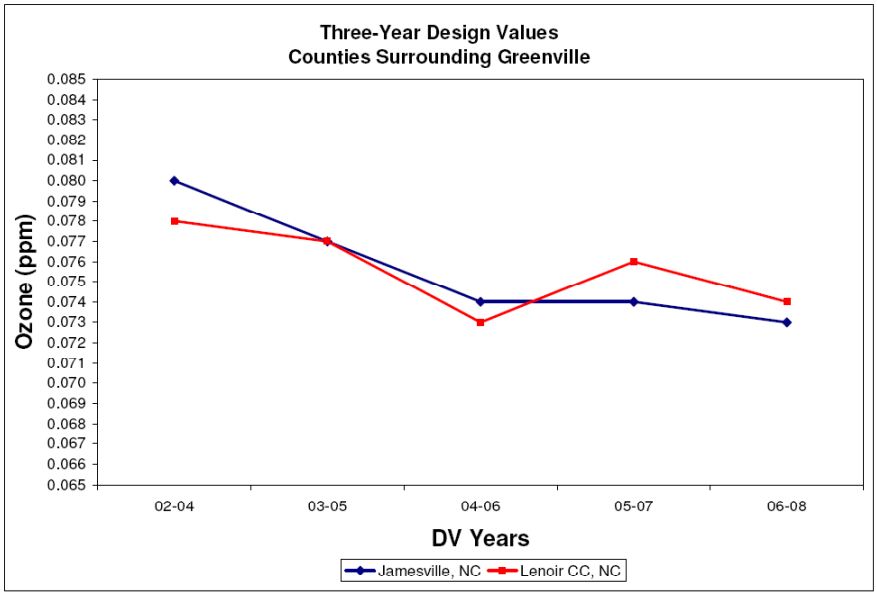

Figure 24: Three-year design values of monitors surrounding the Greenville area.

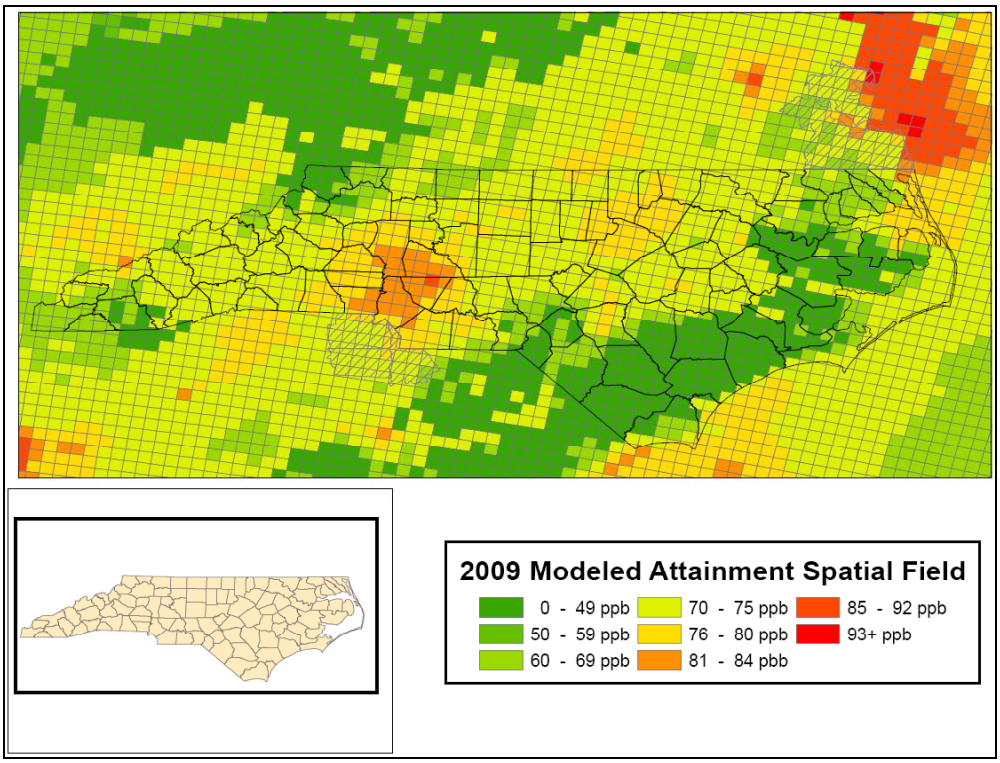

Figure 25: Spatially allocated modeled design values for 2009.

Table 11: Greenville Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Greenville	Farmville	37-147-0099	0.080	0.072	0.079		0.077	
	Pitt County Ag Center	37-147-0006				0.077		
	Lenoir College (Nearby)	37-107-0004	0.081	0.071	0.077	0.074	0.076	0.074
	Jamesville (Nearby)	37-117-0001	0.079	0.070	0.075	0.074	0.074	0.073

This area has a single ozone monitor, which was relocated prior to the start of the 2008 ozone season. Its fourth highest value in 2008 was 0.077 ppm; however, it is recommended that classification of the area be deferred until after the ozone season of 2010 when three consecutive years of data will be available at this monitor. This area has never been designated nonattainment, there are no major NOx sources in the area, an OBD-based I/M program was implemented in Pitt County by 2006, and the nearest upwind and downwind monitors are both in attainment of the new ozone standard (see Lenoir County and Martin County, respectively, in Figure 23) and both are trending downward (cleaner). Additionally, future-year 8-hour ozone State Implementation Plan air quality modeling has shown that the area under consideration is expected to be within attainment by 2009. If a request for deferral is denied, North Carolina recommends Pitt County be designated as nonattainment and no portion of Greene County is designated as nonattainment. The counties associated with the request for deferral and those not recommended are discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Pitt County

This is a Greenville MSA county with one monitor. This is a mostly rural county with an urbanized core. The monitor within the county has recently moved approximately 14.5 miles, which is beyond the distance that would allow the data from the two monitoring sites to be considered a continuous record.

Air Quality Data

As shown in Figure 23 above, this area has 1 monitor with no calculable design value. The monitor was previously located in Farmville, but has moved to the Pitt County Ag Center, in the western part of the county. As shown in Figure 24, monitoring trends at the surrounding ozone monitors indicate a downward progression in the design values, within attainment. Additionally, air quality modeling data shown in Figure 25 indicates the Greenville area will be within attainment by 2009. This future-year modeling has proven to be highly accurate at recreating design values for a given area. Using this information, North Carolina expects the Greenville area monitor to show attainment upon obtaining sufficient data for a design value to be calculated.

Emissions Data:

Based on 2005 emissions inventories, Pitt County has 139.59 tons per year of point source NOx from and the county has 623.40 tons per year of point source VOC from 9 sources. There is one major point source of VOC located in the southeastern part of the county.

Population Density and Degree of Urbanization:

134,107 people live in Pitt County as of 2000. The county is largely rural, with the exception of the urbanized core in Greenville. There are 9 tracts of 250 or fewer people per square mile, 4 tracts of 250 to 500 people per square mile, 1 tract of 500 to 1000 people per square mile, 3 tracts of 1000-2500 people per square, 4 small tracts of 2500-5000 people per square mile and 1 smaller tract of more than 5000 people per square mile. This dense urban core can mostly be attributed to East Carolina University, located in downtown Greenville. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:

Pitt County has 3,377,830 Daily VMT, according to 2007 data, with most commuting occurring within the county. These VMT are expected to increase moderately to 4,065,700 by 2020.

Growth Rates and Patterns:

The population is expected to increase by 19.9% between 2000 and 2010 and by 16.3% between 2010 and 2020.

Meteorology:

Winds across Pitt County are climatologically from the southwest. On days where the monitor experiences the highest levels of ozone, this is mostly attributable to recirculation of emissions within the county. Additional emissions from an EGU downwind also aids in high ozone concentrations.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The Greenville Metropolitan Planning Organization is located within the central portion of Pitt County. This MPO is also within the larger Mideast Rural Planning Organization. Pitt County was not previously designated as nonattainment.

Level of control of emissions sources:
Pitt County has no major point sources for NOx, but does have one major point source for VOC. Large point sources that are non-EGUs are controlled on a case-by-case basis. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Pitt County currently has an OBD-based I/M program. Low-sulfur gasoline is also required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was enacted in 1999 by the General Assembly.

Greene County

This is a Greenville MSA county, but there is no monitor located within this county. This county is entirely rural, with no large commuting impact on the urbanized core. The monitor nearest the county has recently moved beyond the distance that would allow the data from the two monitoring sites to be considered a continuous record. The second nearest monitor is located in Lenoir County at Lenoir Community College in Kinston, with a design value of 0.074 ppm. Based on the rural characteristics, lack of emissions and surrounding monitors indicating attainment, North Carolina recommends no portion of Greene County be designated nonattainment.

Air Quality Data:
As shown in Figure 23 above, this area has 1 monitor with no calculable design value. The monitor was previously located in Farmville, but has moved to the Pitt County Ag Center, in the western part of Pitt County. Monitoring trends at the surrounding ozone monitors indicate a downward progression in the design values, within attainment. Upon obtaining sufficient data for a design value to be calculated for the monitor located in Greene County, North Carolina expects this monitor to also show attainment.

Emissions Data:
Based on 2005 emissions inventories, Greene County has 1.4 tons per year of point-source NOx and the county has 0.07 tons per year of point-source VOC. There are no major point sources in this county.

Population Density and Degree of Urbanization:
18,976 people live in Greene County as of 2000. The county is entirely rural. There are no

tracts with population densities greater than 250 people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:
Greene County has 585,250 Daily VMT, according to 2007 data, comprising 2.98% of the commuting traffic into Pitt County for work. These VMT are expected to increase moderately to 731,000 by 2020.

Growth Rates and Patterns:
The population is expected to increase by 13.5% between 2000 and 2010 and by 8.8% between 2010 and 2020.

Meteorology:
Winds across Greene County are climatologically from the southwest. Given the lack of emissions within the county, North Carolina asserts that this county has no appreciable impact on the air quality within the Greenville MSA.

Geography/Topography:
There are no special geography or topography issues to consider in this region.

Jurisdictional Boundaries:
The Eastern Carolina Rural Planning Organization includes the counties of Greene, Wayne, Lenoir and Duplin. Greene County has never been designated nonattainment.

Level of control of emissions sources:
Greene County has no major point sources for either NOx or VOCs. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Greene County currently has no OBD-based I/M program, but a visual inspection of emissions equipment is required. Low-sulfur gasoline is also required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was enacted in 1999 by the General Assembly.

Virginia Beach-Norfolk-Newport News Nonattainment Area Discussion

EPA Presumptive 8-Hour Ozone Nonattainment Boundary:

Currituck County

North Carolina's Recommended 8-Hour Ozone Nonattainment Boundary:

No portion of Currituck County designated as nonattainment

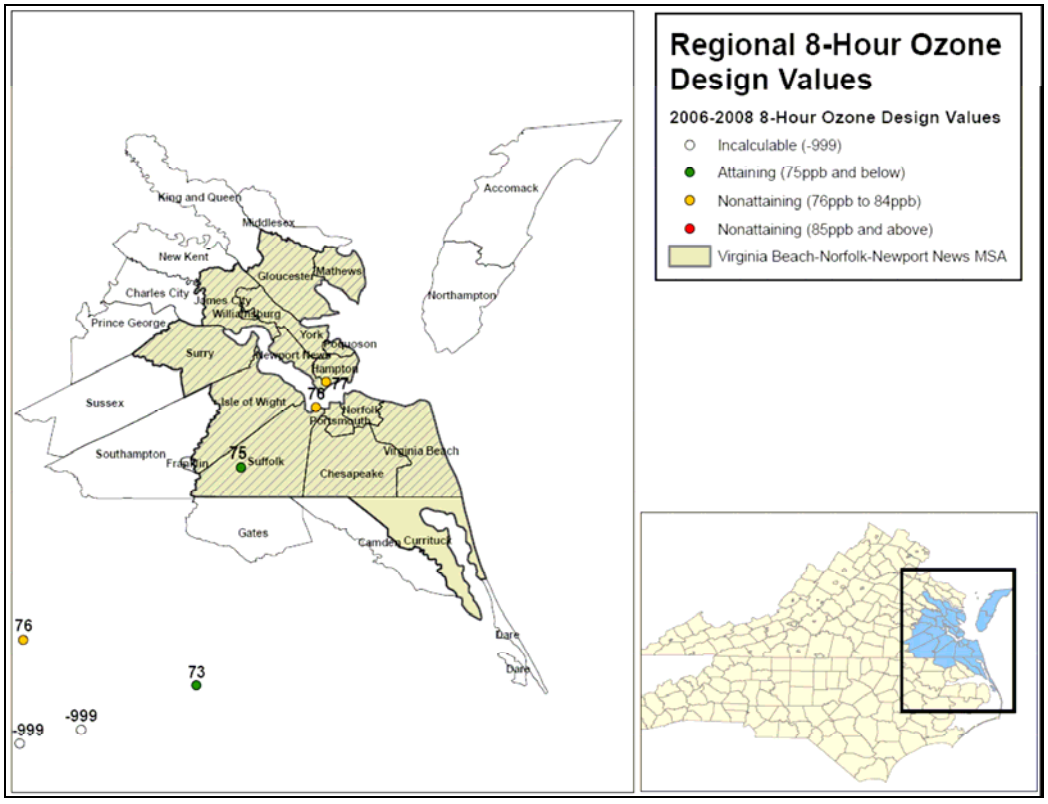

Figure 26: Currituck NC Regional 2006-2008 8-Hour Ozone Design Values Map

Table 12: Fayetteville Regional Ozone Design Value Table

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
Currituck County, Tidewater VA	Jamesville (Nearby)	37-117-0001	0.079	0.070	0.075	0.074	0.074	0.073
	Sulfolk (Virginia)	51-800-0005	0.078	0.071	0.078	0.078	0.075	0.075
	Sulfolk (Virginia)	51-800-0004	0.077	0.077	0.076	0.077	0.076	0.076
	Hampton (Virginia)	51-650-0004	0.078	0.076	0.076	0.079	0.076	0.077

EPA is recommending Currituck County be included in the 8-hour ozone nonattainment boundary within the Virginia Beach-Norfolk-Newport News nonattainment area. North Carolina recommends not designating any portion of Currituck County as nonattainment. The county not recommendation is discussed below, along with the 9 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

Currituck County

This is an MSA county, but it does not have a monitor located in the county. This is a mostly rural county with no impacts on commuting into the urbanized core of the Virginia Beach-Norfolk-Newport News MSA. Therefore, North Carolina is recommending no portion of the county be designated as nonattainment.

Air Quality Data:

As shown in Figure 26 above, this area has 3 monitors with design values ranging from 0.075 ppm to 0.077 ppm. The monitor located nearest Currituck County is in Suffolk County in Holland with a design value of 0.075 ppm. On days where this area experiences its highest ozone concentrations, winds are predominantly out of the north, whereas Currituck County is located downwind of the Virginia Beach-Norfolk-Newport News MSA

Emissions Data:

Based on 2005 emissions inventories, Currituck County has 10.59 tons per year of point-source NOx and the county has 0.22 tons per year of point-source VOC. There are no major point sources of either NOx or VOC throughout the county.

Population Density and Degree of Urbanization:

18,297 people live in Currituck County as of 2000. The county is entirely rural, with all tracts having 100 or fewer people per square mile. (Please see Appendix I for maps of population density)

Traffic and Commuting Patterns:

Currituck County has 971,830 Daily VMT, according to 2007 data, with no major commuting contribution to the Virginia Beach-Newport News-Norfolk MSA. These VMT are expected to increase moderately to 1,571,790 by 2020.

Growth Rates and Patterns:

The population is expected to increase by 41.7% by 2010 and by 30.4% between 2010 and 2020. This high rate is exaggerated by the small base population.

Meteorology:

Winds across Currituck County are climatologically variable from the west-southwest and east-northeast. However, on days where ozone values in the county are highest, the winds are generally northerly, indicating Currituck County is downwind of the Virginia Beach-Newport News-Norfolk MSA. Therefore, Currituck County has no impact on the nonattainment of the aforementioned MSA.

Geography/Topography:

Currituck County is located in close proximity to the Atlantic Ocean. As such, the county is subject to the diurnal shifts in wind direction. Also, because of the variability of wind direction, the atmosphere is typically kept clean and well-mixed.

Jurisdictional Boundaries:

The Albemarle Rural Planning Organization encompasses the northeast portion of the North Carolina coastline. The Hampton Roads (VA) Metropolitan Planning Organization includes

the aforementioned nonattainment area. Currituck County has not been designated nonattainment previously.

Level of control of emissions sources:
Currituck County has no major point sources for NOx and VOC emissions. Additional NOx emissions are from mobile sources, and the combined Federal and state control programs will address these emissions. Currituck County currently does not have an OBD-based I/M program, but a visual check of emissions equipment is required. Low-sulfur gasoline is also required statewide.

> ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.