UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 29 2004

4APT-APB

Honorable Mike F. Easley
Governor of North Carolina
State Capitol
20301 Mail Service Center
Raleigh, NC 27699-0301

Dear Governor Easley:

Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. These tiny particles – about 1/30th the diameter of a human hair – have been scientifically linked to serious human health problems. Their ability to be suspended in air for long periods of time makes them a public health threat far beyond the source of emissions. An important part of our nation's commitment to clean, healthy air deals with reducing levels of this fine particle or PM2.5 pollution.

In February, your State submitted its recommended boundaries for PM2.5 attainment and nonattainment areas. We have thoroughly reviewed your recommendations and the technical information you have submitted to support your recommendations. We appreciate the effort your State has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to notify you that based on the information contained in your submittal, EPA intends to make modifications to recommended designations and boundaries in your State.

The detailed enclosure contains a description of areas where EPA intends to modify your State recommendations, and the basis for such modification. Should you have additional information that you wish to be considered by EPA in this process, we request that you provide it to us by September 1.

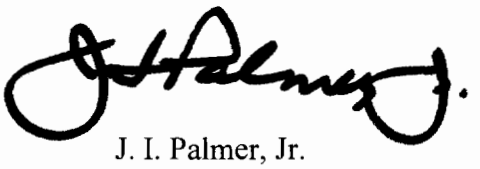
You will hear from us again in November when EPA takes the final step in the PM2.5 designation process and determines those areas that are in attainment and meet the fine particle standards and those areas that do not meet them. For areas in attainment, the challenge will be not only to maintain, but also to continue the progress you have made toward clean air. It is a commitment to no backsliding in your State's clean air status for fine particles. EPA will also issue a proposed fine particle implementation rule prior to final designations, which will allow you to proceed with planning to achieve clean air.

The Bush Administration is addressing fine particle pollution with a comprehensive national clean air strategy. This strategy includes EPA's recent rule to reduce pollution from nonroad diesel engines, and the proposed rule to reduce pollution from power plants in the

eastern U.S. These two rules are important components of EPA's efforts to help States and localities meet the more protective national fine-particle and 8-hour ozone air quality standards. Together these rules will help all areas of the country achieve cleaner air.

Should you or your staff have any questions, I invite you to contact Beverly H. Banister, Director, Air Pesticides and Toxics Management Division, at 404/562-9077, or Kay T. Prince, Chief, Air Planning Branch, at 404/562-9026. We look forward to a continued dialogue with you as we work together to implement the PM2.5 standards.

Sincerely,



J. I. Palmer, Jr.
Regional Administrator

Enclosure

cc: Keith Overcash, NCDENR
William Ross, NCDENR

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4APT-APB

William G. Ross, Secretary
North Carolina Department of Environment
and Natural Resources
1601 Mail Service Station
Raleigh, NC 27699-1601

Dear Mr. Ross:

Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. These tiny particles – about 1/30th the diameter of a human hair – have been scientifically linked to serious human health problems. Their ability to be suspended in air for long periods of time makes them a public health threat far beyond the source of emissions. An important part of our nation's commitment to clean, healthy air deals with reducing levels of this fine particle or PM2.5 pollution.

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Your Governor was sent a letter today notifying him that EPA is modifying the State's recommendation. This letter contains a more detailed enclosure containing a description of areas where EPA intends to modify your State recommendations, and the basis for such modification. Should you have additional information that you wish to be considered by EPA in this process, we request that you provide it to us by September 1, 2004.

You will hear from us again in November when EPA takes the final step in the PM2.5 designation process and determines those areas that are in attainment and meet the fine particle standards and those areas that do not meet them. For areas in attainment, the challenge will be not only to maintain, but also to continue the progress you have made toward clean air. It is a commitment to no backsliding in your State's clean air status for fine particles. EPA will also issue a proposed fine particle implementation rule prior to final designations, which will allow you to proceed with planning to achieve clean air.

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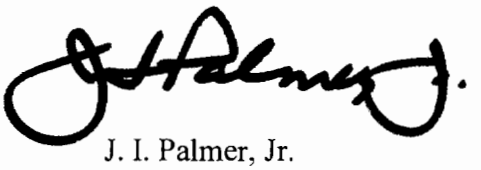

J. I. Palmer, Jr.
Regional Administrator

Enclosure

cc: Keith Overcash, NCDENR

Enclosure for 120 Day Letter
Justification for Modifications to State Recommendations
PM2.5 Nonattainment Areas
State of North Carolina

An Explanation of EPA's 9-Factor Analysis

Factor 1. Emissions in areas potentially included versus excluded from the nonattainment area:

The analysis for factor 1 looks at emissions of carbonaceous particles ("carbon"), inorganic particles ("crustal"), SO2 , and NOx. EPA computed a composite emission score for each county by multiplying the county's emissions as a fraction of the metropolitan area emissions for each of these pollutants times a corresponding air quality weighting factor. The air quality weighting factors for each area are given below and reflect the percentages of the total estimated "urban excess" value found as, respectively, carbonaceous particles, miscellaneous inorganic particles ("crustal material"), ammonium sulfate, and ammonium nitrate. These scores add to 100 for the metropolitan area counties. Composite scores were also calculated for counties adjacent to the metropolitan area. Tables presented under factor 1 present the emissions of carbonaceous particles, inorganic particles, SO2 , and NOx and the composite emission scores for the counties in the corresponding metropolitan area and adjacent counties. Metropolitan area counties are in bold. Emissions data indicate the potential for a county to contribute to observed violations, often making the emissions data the most important factor in assessing boundaries of nonattainment areas.

"Urban excess" values are derived by comparing urban monitored component concentrations against rural monitored component concentrations. Concentrations of the four PM2.5 components are obtained from local data if available (or, if necessary, from the nearest available urban site), and are compared to available rural concentrations. The monitoring sites used for this purpose are identified below. Although this information is air quality information, it is presented under Factor 1 due to its integration into the analysis of emissions information.

Factor 2. Air quality in potentially included versus excluded areas:

The air quality analysis looks at the annual averaged design value for each area based on data for 2001 to 2003. Counties without monitors are not listed.

Factor 3. Population density and degree of urbanization including commercial development in included versus excluded areas:

Tables presented under factor 3 show the 2003 population for each metropolitan area, as well as the population density for each county in that area. Population data indicate the likelihood of population-based emissions that might contribute to violations.

Factor 4. Traffic and commuting patterns:

The traffic and commuting analysis looks at the number of commuters in each county who drive to another county within the metropolitan area ("Number"), the percent of total commuters in each county who commute to other counties within the metropolitan area ("percent"), as well as the total Vehicle Miles Traveled (VMT) for each county in thousands of miles. A county with numerous commuters is generally an integral part of the area, and would be an appropriate part of the domain of some mobile source strategies, thus warranting inclusion in the nonattainment area.*

**Note that the percent of commuters traveling to counties within the metropolitan area is based on the total number of commuters from that county. This total includes commuters who may travel outside the metropolitan area from their county of origin.*

Factor 5. Expected growth:

The expected growth analysis looks at the percent growth for counties in each metropolitan area from 1990 to 2000.

Factor 6. Meteorology:

The meteorology analysis looks at wind data gathered over a ten year period by the National Weather Service. Tables presented under factor 6 list the year round average prevailing wind directions by quadrant for each county in the corresponding metropolitan area. These data show that annual average PM2.5 concentrations are influenced by emissions in any direction at various times, but these data may also suggest that emissions in some directions relative to the violation may be more prone to contribute than emissions in other directions.

Factor 7. Geography/topography:

The geography/topography analysis looks at physical features of the land that might have an effect on the airshed, and therefore, the distribution of particulate matter over an area. The State of North Carolina has no such features that significantly influenced EPA's recommended nonattainment areas.

Factor 8. Jurisdictional boundaries:

The analysis of jurisdictional boundaries looks at the planning and organizational structure of an area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner.

Factor 9. Level of control of emission sources:

The level of control analysis looks at what controls are currently implemented in each area.

Below is the nine factor analysis for Greensboro-Winston-Salem-High Point, NC. The Greensboro-Winston-Salem-High Point, NC Metropolitan Statistical Area (MSA) contains the counties of Stokes, Guilford, Davidson, Forsyth, Randolph, Alamance, Yadkin, and Davie.

In February 2004, North Carolina recommended that the entire county of Davidson, be designated as nonattainment for the Fine Particulate Matter Standard. The table below shows the State recommendations and EPA modifications for the Particulate Matter(PM 2.5) nonattainment area in Greensboro-Winston-Salem-High Point, NC. EPA is recommending Davidson County be designated nonattainment because it has a violating PM 2.5 monitor. The MSA counties of Guilford, Stokes, Forsyth and Randolph are also being recommended as nonattaiment. Guilford, Forsyth and Randolph counties are adjacent to Davidson County and have large populations and large emissions. Stokes has significant power plant emissions. EPA agrees that Alamance, Davie, Yadkin, Rowan, Chatham, Rockingham, and Iredell Counties be designated attainment/unclassifiable. Alamance is an MSA county with an attaining monitor of 13.7 micrograms per cubic meter ($\mu g/m^3$), 75 % of the commuters remain in Alamance County and the county has low emissions. Davie and Yadkin are MSA counties that do not contain PM 2.5 monitors, have low populations, and low commuting into Davidson. There is significant distance between the violating monitor and the counties of Iredell and Yadkin. Rowan and Iredell are adjacent to the MSA, do not contain PM 2.5 monitors and are a part of the Charlotte-Gastonia-Rock Hill nonattainment area for ozone. Rowan and Rockingham both have small power plants and there are attaining monitors in counties between the SO_2/NOx sources in Rowan and Rockingham counties and the violating monitor. Chatham is an adjacent county to the Greensboro-Winston-Salem-High Point MSA with an attaining monitor of 12.2 $\mu g/m^3$, has low population, and part of the county is in the Raleigh-Durham-Chapel Hill nonattainment area for ozone. The remaining adjacent counties all have low emissions, low population and low VMT, indicating they should be attainment/unclassifiable.

Area	EPA Recommendation	State Recommendation
Greensboro-Winston-Salem-High Point, NC	**Full Counties:** Stokes, Guilford, Davidson, Forsyth, and Randolph	**Full Counties:** Davidson

The following is a brief summary of the 9 criteria:

The following table has 2001 $PM_{2.5}$, SO_2, NOx, VOC, and Ammonia (Amm) emissions in tons, and weighted emissions scores for the Greensboro-Winston-Salem-High Point Area and surrounding counties. The MSA counties are in **bold**.

		PM 2.5	SO_2	NOx	VOC	Amm	Weighted emissions score	Cumulative Weighted emissions score
NC	**Stokes**	**4,821**	**83,409**	**35,936**	**2,566**	**357**	**32.8**	**32.8**
NC	**Guilford**	**2,418**	**2,833**	**19,068**	**34,464**	**1,178**	**17.6**	**50.4**
NC	**Davidson**	**1,951**	**1,398**	**11,281**	**14,970**	**632**	**12.9**	**63.3**
NC	**Forsyth**	**1,559**	**5,885**	**14,552**	**20,679**	**722**	**11.7**	**75.0**
NC	**Randolph**	**1,370**	**907**	**5,898**	**10,307**	**4,014**	**9.5**	**84.5**
NC	**Alamance**	**1,181**	**749**	**5,618**	**8,967**	**730**	**8.2**	**92.7**
NC	**Yadkin**	**606**	**318**	**2,061**	**2,247**	**896**	**4.0**	**96.7**
NC	**Davie**	**508**	**205**	**1,959**	**3,278**	**448**	**3.3**	**100.0**
NC	Rowan	2,012	12,465	11,681	11,323	726	13.4	
NC	Chatham	1,714	11,605	5,823	4,734	3,012	11.7	
NC	Rockingham	1,555	6,263	12,227	8,770	523	11.2	
NC	Iredell	1,537	1,365	11,065	10,346	2,090	10.8	
NC	Surry	1,224	1,238	5,055	7,478	1,811	8.5	
VA	Pittsylvania	980	1,828	7,490	4,149	581	7.2	
NC	Moore	956	409	3,197	6,519	2,396	6.9	
NC	Wilkes	966	647	2,890	5,097	5,300	6.6	
NC	Orange	857	756	6,264	6,751	572	6.4	
VA	Henry	818	535	3,811	10,517	197	5.6	
NC	Stanly	795	3,129	2,891	4,581	1,460	5.3	
NC	Montgomery	516	484	1,631	4,175	1,246	3.6	
NC	Caswell	483	199	1,071	1,622	155	3.2	
VA	Patrick	408	176	1,039	1,363	214	2.8	
VA	Carroll	378	509	2,305	1,986	441	2.7	
VA	Grayson	291	95	819	952	405	2.0	
NC	Alleghany	217	190	379	590	425	1.4	

Based on the analysis for this factor, there appears to be emissions in Stokes, Guilford, Forsyth, and Randolph counties that contribute to the air quality in Davidson County, resulting in a violating monitor there. This analysis shows that the adjacent counties of Rowan, Chatham, Rockingham, and Iredell have emissions that may contribute to the violation in Davidson County.

However, these counties are more distant from the violating monitor. Chatham County has an

attaining monitor and is part of the Raleigh MSA. Rowan and part of Iredell County are in the Charlotte ozone nonattainment area.

Factor 2: Air Quality in potentially included versus excluded areas

		2001-2003 Design Value
NC	**Guilford**	**14.1**
NC	**Davidson**	**15.8**
NC	**Forsyth**	**14.6**
NC	**Alamance**	**13.7**
NC	Chatham	12.2
NC	Orange	13.1
NC	Montgomery	12.1
NC	Caswell	13.3

There are six monitors in the MSA (two in Guilford, and two in Forsyth counties and one in Davidson, and Alamance counties) and five monitors in the adjacent counties. The monitor in Davidson County, is violating the Particulate Matter Standard of 15.0 micrograms per cubic meter ($\mu g/m^3$). All other monitors in this area are attaining the Particulate Matter Standard.

Factor 3: Population Density and Degree of Urbanization including commercial development in included versus excluded areas

The following table has the populations for the counties in the Greensboro-Winston-Salem-High Point area and adjacent counties with significant weighted emissions scores.

		2002 Population	% Population of MSA	Population Density (pop./ mi^2)
NC	**Stokes**	**44,984**	**3.5**	**100**
NC	**Guilford**	**430,937**	**33.5**	**663**
NC	**Davidson**	**151,238**	**11.6**	**274**
NC	**Forsyth**	**314,933**	**24.5**	**768**
NC	**Randolph**	**134,217**	**10.4**	**170**
NC	**Alamance**	**135,893**	**10.6**	**315**
NC	**Yadkin**	**37,329**	**2.9**	**111**
NC	**Davie**	**36,734**	**2.9**	**139**
NC	Rowan	133,359		261
NC	Chatham	53,893		79
NC	Rockingham	92,778		164

NC	Iredell	130,178		227

Based on the analysis for this factor, there appears to be significant populations in Guilford, Forsyth, Davidson, Rowan, Iredell, Randolph and Alamance counties, indicating potential contribution.

Factor 4: Traffic and commuting patterns

Commuting Information

Total commuters in Davidson County: 72,893
Commuters in Davidson County, NC, who work in Davidson County: 40,621 (56%)

Total commuters in Forsyth County: 147,838
Commuters in Forsyth County, NC, who work in Forsyth County: 119,233 (81%)
Commuters from Forsyth County, NC to Davidson County, NC: 4,136 (3%)

Total commuters in Guilford County: 213,079
Commuters in Guilford County, NC, who work in Guilford County: 187,150 (88%)
Commuters from Guilford County, NC to Davidson County, NC: 2,982 (1%)

Total commuters in Randolph County: 65,803
Commuters in Randolph County, NC, who work in Randolph County: 38,637 (59%)
Commuters from Randolph County, NC to Davidson County, NC: 2,607 (4%)

Total commuters in Stokes County: 21,709
Commuters in Stokes County, NC, who work in Stokes County: 6,330 (29%)
Commuters from Stokes County, NC to Davidson County, NC: 252 (1%)

The counties of Davie and Rowan have a small number of commuters and very few of them commute to Davidson County. Chatham, Yadkin, Iredell, and Rockingham counties have a low number of commuters and most of them stay within their counties.

Based on commuting patterns, Forsyth and Guilford appear to have the most impact on the violating monitor in Davidson County. However, the impact on the monitor from commuting appears to be small.

The following table contains the vehicle miles traveled (VMT) for the counties in the Greensboro-Winston-Salem-High Point area and some adjacent counties with significant emissions. (MSA counties are in **bold**).

		2002 VMT (thousands of miles)
NC	**Stokes**	**415**
NC	**Guilford**	**5,096**
NC	**Davidson**	**1,765**
NC	**Forsyth**	**3,832**
NC	**Randolph**	**1,486**
NC	**Alamance**	**1,575**
NC	**Yadkin**	**520**
NC	Davie	476
NC	Rowan	1,654
NC	Chatham	434
NC	Rockingham	923
NC	Iredell	1,901

Based on total VMT, there appears to be contribution to air quality in Davidson County from Guilford, Davidson, Forysth, Rowan, Iredell, Randolph and Alamance counties. However, there is very low or no commuting into Davidson County from Rowan. Iredell, and Alamance Counties

Factor 5: Expected growth

The following table has the population and population growth on a percentage basis figures for counties in the Greensboro-Winston-Salem-High Point MSA and some adjacent counties with significant emissions. As noted above, Chatham County is part of the Raleigh MSA, and Iredell and Rowan Counties are in the Charlotte rather than the Greensboro ozone nonattainment area.

		2002 Population	Growth '90-'00	% Change '90-'00
NC	**Stokes**	**44,984**	**7,488**	**20**
NC	**Guilford**	**430,937**	**73,628**	**21**
NC	**Davidson**	**151,238**	**20,569**	**16**
NC	**Forsyth**	**314,933**	**40,189**	**15**
NC	**Randolph**	**134,217**	**23,908**	**22**
NC	**Alamance**	**135,893**	**22,587**	**21**
NC	**Yadkin**	**37,329**	**5,860**	**19**
NC	**Davie**	36,734	6,976	25
NC	Rowan	133,359	19,735	18
NC	Chatham	53,893	10,570	27
NC	Rockingham	92,778	5,864	7

NC	Iredell	130,178	29,729	32

Based on the analysis for this factor, there appears to be significant growth in Davidson, Guilford, Forsyth, Alamance, Randolph, Rowan, Chatham, and Iredell counties indicating a potential contribution to the air quality in Davidson County.

Factor 6: Meteorology

The following meteorological information was provided by North Carolina. This summarizes the wind directions for the MSA during the time periods when PM2.5 values are the highest.

Summertime: southwesterly winds and recirculating patterns dominate. Main urban areas of influence include Charlotte, the Triad, and Hickory.

Wintertime: More northerly and stronger northwesterly winds observed that during the summer. High PM2.5 is generally observed prior to frontal passages when high pressure is in control or during strong nocturnal low-level temperature inversions. Year-round trajectories indicate influence from nearby states.

The information provided is not sufficient to provide a compelling argument to exclude counties based on prevailing winds.

Factor 7: Geography/topography

There are no significant topographical issues associated with this MSA. Chatham, Iredell, and Rockingham counties are one or more counties away from Davidson county. Additionally, there is one or more attaining monitors between the major emissions sources in these counties and the violating monitor, indicating no contribution.

Factor 8: Jurisdictional boundaries

The 8-hour nonattainment boundary designation for the Greensboro-Winston-Salem-High Point area includes the entire counties of Davidson, Davie, Forsyth, Guilford, Alamance, Caswell, Randolph, and Rockingham. Davie, Alamance, Caswell, and Rockingham were designated nonattainment for ozone because they contained violating monitors not because they were found to be contributing. Rowan county and a portion of Iredell county were designated nonattainment for the ozone standard as apart of the Charlotte-Gastonia-Rock Hill MSA area. Due to significant NOx controls, Stokes County was determined not to contribute to the ozone violations.

Factor 9: Level of control of emission sources

Belews Creek is the largest coal-burning station owned by Duke Power located in Stokes County, NC. Duke Power completed the first phase of its massive Selective Catalytic Reduction (SCR) project at Belews Creek Steam Station that will reduce the power plant's nitrogen oxide emissions by over 90 percent. No scrubbers are installed at this time, but are scheduled to be installed in 2009.

The state initiatives are listed below:
NOx SIP Call
The Clean Smokestacks Act
Clean Air Bill
On Board Diagnostics II Emissions Inspection Program
$PM_{2.5}$ Forecasting

Hickory-Morganton-Lenoir, NC

The following is the nine factor analysis for Hickory-Morganton-Lenoir, NC. The Hickory-Morganton-Lenoir, NC Metropolitan Statistical Area (MSA) contains the counties of Catawba, Caldwell, Burke, and Alexander.

In February 2004, North Carolina recommended that the Unifour Metropolitan Planning Organization's (MPO) Planning Boundary in Catawba County, be designated as nonattainment. The table below shows State Recommendations and EPA recommended modifications for the Particulate Matter 2.5 (PM 2.5) nonattainment area in the Hickory-Morganton-Lenoir area. EPA is modifying the recommendation to include the entire county of Catawba and partial county boundaries in Burke and Caldwell Counties. Catawba County has a violating PM 2.5 monitor. The partial county boundaries in Burke and Caldwell Counties follow the MPO boundary lines which were the boundaries determined in the 8-hour ozone designation in April 2004 for the two counties. Over 20 percent of the commuters from Burke and Caldwell counties commute to Catawba County and both counties contain population levels that indicate contribution. EPA agrees that the MSA county of Alexander and the adjacent counties of Rutherford, Iredell, Cleveland, and Wilkes be designated attainment/unclassifiable. These counties have low population, and are low commuting into Catawba County, distant from the violating monitor in Catawba County. The remaining adjacent counties all have low emissions and low population, indicating they should be attainment/unclassifiable.

Area	EPA Recommendation	State Recommendation
Hickory-Morganton-Lenoir	**Full Counties:** Catawba, **Partial Counties:** Burke and Caldwell	**Full Counties:** None **Partial Counties:** Catawba

The following is a brief summary of the 9 criteria for the Hickory-Morganton-Lenoir MSA and surrounding counties . These analyses were based on existing available data.

Factor 1: Emissions in areas potentially included versus excluded from the nonattainment area

The following table has 2001 $PM_{2.5}$, SO2, NOx, VOC, and Ammonia (Amm) emissions in tons, and weighted emissions scores for the Hickory-Morganton-Lenoir Area and surrounding counties. The Metropolitan Statistical Area (MSA) counties are in **bold**.

	PM 2.5	SO_2	NOx	VOC	Amm	Weighted emissions score	Cumulative Weighted emissions score
Catawba	**5,153**	**78,620**	**27,968**	**19,760**	**886**	**59.7**	**59.7**
Caldwell	**1,104**	**634**	**3,530**	**11,122**	**391**	**18.1**	**77.8**
Burke	**1,198**	**877**	**4,601**	**7,721**	**562**	**17.0**	**94.8**
Alexander	**365**	**349**	**988**	**3,312**	**1,217**	**5.1**	**99.9**
Rutherford	2,323	30,023	12,135	4,847	254	28.4	
Iredell	1,537	1,365	11,065	10,346	2,090	25.3	
Cleveland	1,258	1,261	4,975	6,591	1,240	18.4	
Wilkes	966	647	2,890	5,097	5,300	15.3	
Mc Dowell	751	373	3,675	4,230	214	13.6	
Lincoln	785	513	2,880	4,556	645	10.8	
Watauga	541	352	1,523	2,370	341	8.5	
Avery	269	163	730	985	77	4.4	

Based on the analysis for this factor, there appears to be emissions in the MSA counties of Caldwell and Burke, counties that contribute to the violation in Catawba County. Although there are large SO_2 emissions in Rutherford county, adjacent to Burke, the source is distant from the violating monitor.

Factor 2: Air Quality in potentially included versus excluded areas

	2001-2003 Design Value
Catawba	**15.5**
Mc Dowell	14.2
Watauga	10.9

There is one monitor in this area, in Catawba County, which is violating the particulate matter standard of 15.0 micrograms per cubic meter ($\mu g/m^3$). Two adjacent counties contain monitors attaining the standard.

Factor 3: Population Density and Degree of Urbanization

The following table has the populations for the counties in the Hickory-Morganton-Lenoir area and adjacent counties with significant emissions. (MSA counties are in **bold**.)

	2002 Population	% Population of MSA	Population Density (pop./ mi^2)
Catawba	**146,690**	**42.0**	**367**
Caldwell	**78,513**	**22.5**	**166**
Burke	**89,638**	**25.7**	**177**
Alexander	**34,400**	**9.8**	**132**
Rutherford	63,287		112
Iredell	130,178		227
Cleveland	97,960		211
Wilkes	66,773		88

Based on the analysis for this factor, there appears to significant populations in Catawba, Iredell, Cleveland, Caldwell and Burke counties, indicating potential contribution.

Factor 4: Traffic and commuting patterns

Commuting Information

Total commuters in Catawba County: 73, 984
Commuters in Catawba County, NC, who work in Catawba County: 62, 459 (84%)

Total commuters in Rutherford County: 27, 673
Commuters in Rutherford County, NC, who work in Rutherford County: 21, 812 (79%)
Commuters from Rutherford County, NC to Burke County, NC: 305 (1%)

Total commuters in Caldwell County: 38, 970
Commuters in Caldwell County, NC, who work in Caldwell County: 26, 932 (69 %)
Commuters from Caldwell County, NC to Catawba County, NC: 8,011 (21 %)

Total commuters in Burke County: 42,214
Commuters in Burke County, NC, who work in Burke County: 29, 123 (69%)

Commuters from Burke County, NC to Catawba County, NC: 8,366 (20%)

Total commuters in Alexander County: 31, 041
Commuters in Alexander County, NC, who work in Alexander County: 24, 270 (51%)
Commuters from Alexander County, NC to Catawba County, NC: 5,679 (32%)

Most of the commuters in Iredell, Cleveland and Wilkes counties commute within their counties and very few of them commute to Davidson County.

Based on commuting patterns, Caldwell, Alexander and Burke counties appear to have the most potential impact on the violating monitor in Catawba county.

The following table contains the vehicle miles traveled (VMT) for the counties in the Hickory-Morganton-Lenoir MSA and some adjacent counties with significant weighted emissions scores. (MSA counties are in **bold**.)

	2002 VMT (thousands of miles)
Catawba	**2,048**
Caldwell	**738**
Burke	**1,112**
Alexander	**229**
Rutherford	606
Iredell	1,901
Cleveland	1,125
Wilkes	619

Based on the analysis for this factor, Burke County has VMT that appears to contribute to the air quality in Catawba County. Although the adjacent counties of Iredell and Cleveland have significant levels of VMT, there is little commuting to Catawba County from these counties.

Factor 5: Expected growth

The following table has the population and population growth figures for counties in the Hickory-Morganton-Lenoir MSA and some adjacent counties with significant emissions.

	2002 Population	Growth '90-'00	Pct change '90-'00
Catawba	**146,690**	**23,273**	**20**
Caldwell	**78,513**	**6,706**	**9**
Burke	**89,638**	**13,404**	**18**
Alexander	**34,400**	**6,059**	**22**
Rutherford	63,287	5,981	11
Iredell	130,178	29,729	32
Cleveland	97,960	11,573	14
Wilkes	66,773	6,239	11

Based on the analysis for this factor, there appears to be significant growth on a percentage in Catawba and Alexander Counties in the MSA and adjacent Iredell County, indicating a potential contribution to the air quality in Catawba County. Although the percentage growth is high for the Iredell County, it is more closely associated with the Charlotte area.

Factor 6: Meteorology

The following meteorological information was provided by North Carolina. This summarizes the wind directions for the MSA during the time periods when $PM_{2.5}$ values are the highest.

Summertime: southwesterly winds and recirculating patterns dominate. Main urban areas of influence include Charlotte, the Triad, and Hickory.

Wintertime: More northerly and stronger northwesterly winds observed that during the summer. High PM2.5 is generally observed prior to frontal passages when high pressure is in control or during strong nocturnal low-level temperature inversions. Year-round trajectories indicate influence from nearby states.

The information provided is not sufficient to provide a compelling argument to exclude counties based on prevailing winds.

Factor 7: Geography/topography

There are no significant topographical issues associated with this MSA.

Factor 8: Jurisdictional boundaries

The 8-hour nonattainment boundary designation for the Hickory-Morganton-Lenoir area includes the entire counties of Alexander and Catawba and partial counties of Burke and Caldwell. The nonattainment designation in Burke and Caldwell counties are along the Unifour Metropolitan Planning Organization boundaries. Catawba County is located geographically between Alexander and Lincoln Counties, which both have monitors violating the 8-hour ozone standard.

In Catawba County, a second monitor was operated approximately 10 miles southwest of the current violating Hickory monitor. This monitor was further removed from a major highway. The location of this monitor at a rescue squad and was not able to continue at that location. While in existence for seven quarters, this monitor showed an average of 1.89 $\mu g/m^3$ lower than the current violating monitor. Therefore, the state believes that this monitor would have continued to show attainment/unclassifiable if it remained in existence to collect three years of data.

Factor 9: Level of control of emission sources

Duke Power - Marshall Steam Station (Catawba County)

No scrubbers are installed at this time. However, in 2004, Duke Power began installation of flue gas desulfurization (scrubber) equipment. This equipment will lower sulfur dioxide emissions by approximately 90 percent. The project is scheduled for completion in 2007.

The state initiatives are listed below:
NOx SIP Call
The Clean Smokestacks Act
Clean Air Bill
On Board Diagnostics II Emissions Inspection Program
$PM_{2.5}$ Forecasting