Section 110(a)(1) Maintenance Plan
For the
1997 8-Hour Ozone Standard

For

Greensboro/Winston-Salem/High Point
1-Hour Ozone Maintenance Area

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Prepared by:

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Division of Air Quality

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PREFACE

This document contains North Carolina's Section 110(a)(1) Maintenance Plan for the 8-hour ozone National Ambient Air Quality Standard (NAAQS) for the Greensboro/Winston-Salem/High Point 1-hour ozone maintenance area.

EXECUTIVE SUMMARY

Introduction

Ozone is formed by a complex set of chemical reactions involving volatile organic compounds (VOCs), nitrogen oxides (NOx) and to a lesser extent carbon monoxide (CO). These gases are generated by combustion processes, certain industrial processes and even by natural sources such as trees. Tailpipe emissions from mobile sources (vehicles) are also significant sources. Even the emissions from such sources as boat engines, lawn mowers and construction equipment contribute to the formation of ozone. Ozone formation is promoted by strong sunlight, warm temperatures and light winds and is hence a problem only during the hot summer months.

The 1997 8-hour ozone national ambient air quality standard (NAAQS) is 0.08 parts per million (ppm). An exceedance of the 8-hour ozone NAAQS occurs when a monitor measures ozone above 0.084 ppm on average for an eight-hour period. A violation of this NAAQS occurs when the average of the annual fourth highest daily maximum 8-hour ozone values over three consecutive years is greater than or equal to 0.085 ppm. This three-year average is termed the "design value" for the monitor. The design value for a nonattainment area is the highest monitor design value in the area.

Greensboro/Winston-Salem/High Point Air Quality History

The Greensboro/Winston-Salem/High Point area (referred to as the Triad area) was designated as moderate nonattainment for the 1-hour ozone National Ambient Air Quality Standard in November 1991. In November 1993, this area was redesignated to attainment/maintenance for the 1-hour ozone standard.

In December 2002, the Triad area signed an Early Action Compact (EAC) with the North Carolina Department of Environment and Natural Resourses and the United States Environmental Protection Agency (USEPA) for the 1997 8-hour ozone standard. The EAC gave the area an opportunity to develop local control strategies to meet the 1997 8-hour ozone standard earlier than required by the Clean Air Act. In turn, the USEPA agreed to defer the effective date of the nonattainment designation for the EAC areas. If an EAC area attained the 1997 8-hour ozone standard by December 31, 2007 and met all of its EAC milestones, the USEPA agreed to designate the area as attainment.

In April 2004, the USEPA designated the Triad area for the 1997 8-hour ozone standard and deferred the effective date. The Triad EAC area met all of their milestones and attained the 1997

8-hour ozone standard by the December 2007 deadline. The USEPA designated the Triad area as attainment/unclassifiable in April 2008.

Section 110(a)(1) Maintenance Plan Requirements

Section 110(a)(1) of the Clean Air Act requires that each state adopt and submit to the USEPA a plan which provides for implementation, maintenance and enforcement of primary standards for all areas within the state. The USEPA stated that a 110(a)(1) maintenance plan is required for those areas that are designated as attainment/unclassifiable for the 1997 8-hour ozone standard and are designated as attainment for the 1-hour ozone standard with an approved maintenance plan. The Triad area meets these conditions and therefore North Carolina is required to submit a 110(a)(1) maintenance plan for the area. The requirements of the maintenance plan include an attainment emissions inventory, a maintenance demonstration with a future inventory year, a commitment to continue ambient air quality monitoring, a contingency plan to ensure that any violations of the 1997 8-hour ozone standard is promptly corrected and verification of a continued attainment tracking mechanism.

Conclusion

The emission inventory comparison demonstrates that the estimated emissions are expected to decrease from the attainment inventory year through the end future year. Additionally, the ambient air quality data demonstrates that the Triad maintenance area has continued to maintain and is well below the 1997 8-hour ozone standard. The North Carolina Division of Air Quality (NCDAQ) has developed a contingency plan based on a number of triggers and tracking mechanisms that will ensure that the Triad area continues to maintain the 1997 8-hour ozone NAAQS. Therefore, with this submission, the NCDAQ believes the requirements of the Section 110(a)(1) maintenance plan for the 1997 8-hour ozone standard have been met.

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1.0 INTRODUCTION

1.1 WHAT IS TROPOSPHERIC OZONE

Ozone, a strong chemical oxidant, is the pollutant of main concern. It adversely impacts human health through effects on respiratory function and can also damage forests and crops. Ozone is not emitted directly by industrial sources or motor vehicles but instead, is formed in the lower atmosphere, the troposphere, by a complex series of chemical reactions involving nitrogen oxides (NOx), the result of combustion processes, and reactive organic gases. Organic gases, also termed volatile organic compounds (VOCs), include many industrial solvents, toluene, xylene and hexane as well as the various hydrocarbons that are evaporated from the gasoline used by motor vehicles or emitted through the tailpipe following combustion.

Ozone formation is promoted by strong sunlight, warm temperatures and light winds. High concentrations tend to be a problem in the eastern United States only during the hot summer months when these conditions frequently occur. Therefore, the U. S. Environmental Protection Agency (USEPA) mandates seasonal monitoring of ambient ozone concentrations in North Carolina only from April 1 through October 31 as described in Title 40 of the Code of Federal Regulations Part 58 (40 CFR 58).

In 1997, the USEPA revised the primary (health) and secondary (welfare) national ambient air quality standards (NAAQS) for ozone by establishing 8-hour standards. An exceedance of the 8-hour ozone NAAQS occurs when a monitor measures ozone above 0.084 ppm on average for an eight-hour period. A violation of this NAAQS occurs when the average of the annual fourth highest daily maximum 8-hour ozone values over three consecutive years is greater than or equal to 0.085 ppm. This three-year average is termed the “design value” for the monitor. The design value for a nonattainment area is the highest monitor’s design value in the area.

1.2 GREENSBORO/WINSTON-SALEM/HIGH POINT AIR QUALITY HISTORY

Since the 1977 amendments to the Clean Air Act, areas of the country that had not attained the ambient standard for a particular pollutant were formally designated as nonattainment for that pollutant. This formal designation concept was retained in the 1990 Amendments.

The Greensboro/Winston-Salem/High Point area (referred to as the Triad area) was designated by the USEPA as “moderate” nonattainment for the 1-hour ozone standard in November 1991. The nonattainment area included Davidson, Forsyth and Guilford Counties and a portion of

Davie County (Figure 1.2-1). The design value was 0.151 ppm for the Triad area, based mainly on air quality data from the unusually severe summer of 1988. In November 1992, the State of North Carolina submitted a request to redesignate this area to maintenance status, based upon three years of clean air quality data (1990 through 1992). The State submitted supplemental information to the USEPA in June 1993, and the Triad area was redesignated to attainement/maintenance status on November 8, 1993.

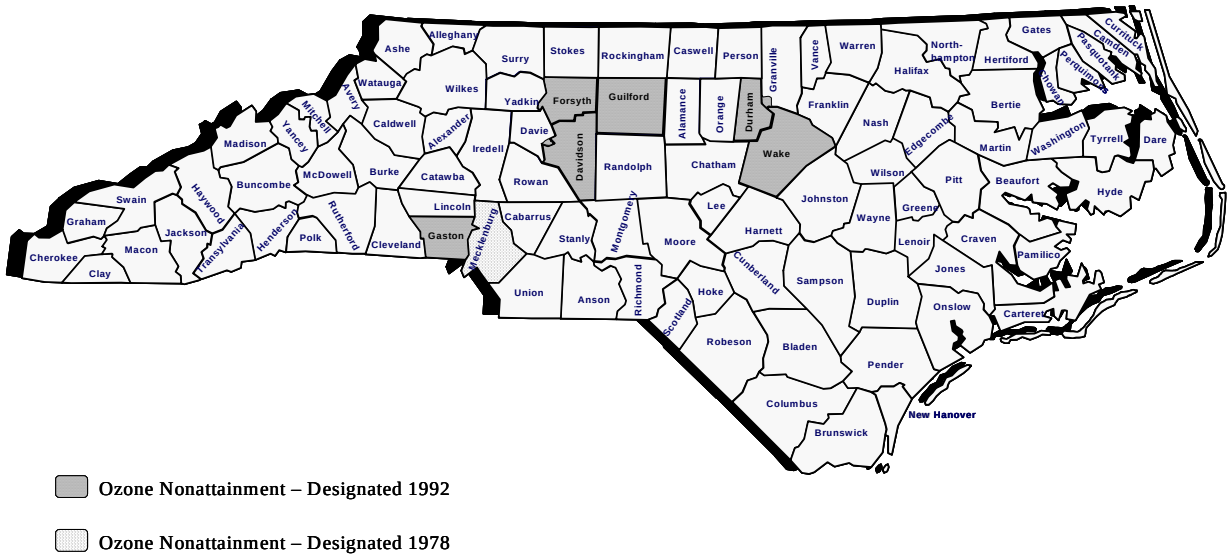

Figure 1.2-1 North Carolina 1-Hour Ozone Nonattainment Areas

For the 1997 8-hour ozone standard, the Triad area signed an Early Action Compact (EAC) with the North Carolina Department of Environment and Natural Resources and the USEPA. The EAC, signed in December 2002, gave areas the opportunity to develop local control strategies to meet the 1997 8-hour ozone NAAQS earlier than required by the Clean Air Act. In turn, the USEPA agreed to defer the effective date of the nonattainment designation for these areas. If an EAC area attained the 1997 8-hour ozone NAAQS by December 31, 2007 and met all of its EAC milestones, the USEPA agreed to designate the area as attainment.

In April 2004, the USEPA designated the Triad area as nonattainment for the 1997 8-hour ozone standard and deferred the effective date. The designated area included Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Randolph, and Rockingham Counties (Figure 1.2-2). The Triad EAC area met all of their EAC milestones and attained the 1997 8-hour ozone standard by December 2007. The USEPA designated the Triad area as attainment/unclassifiable in April 2008.

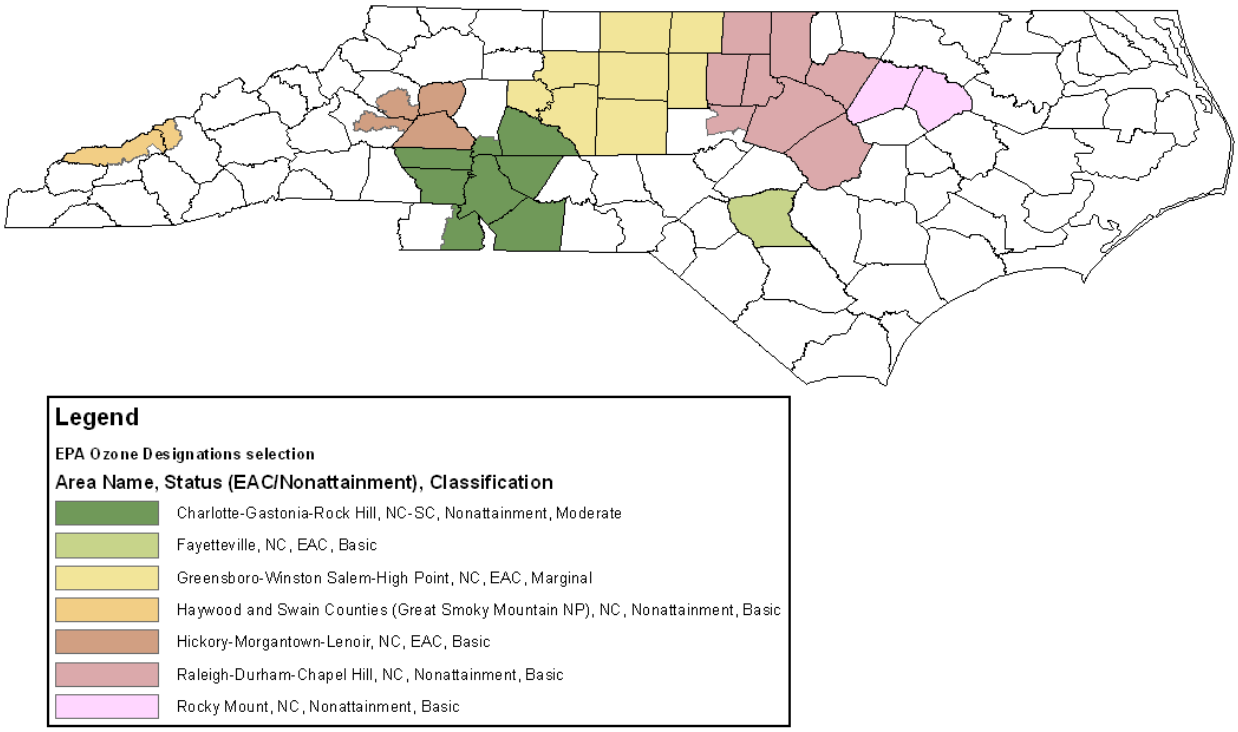

Figure 1.2-2 North Carolina 8-Hour Ozone Nonattainment Areas

1.3 CLEAN AIR ACT SECTION 110(a)(1) MAINTENANCE PLAN REQUIREMENTS

Section 110(a)(1) of the Clean Air Act requires that each state adopt and submit to the USEPA a plan which provides for implementation, maintenance and enforcement of primary standards for all areas within the state. The USEPA guidance (Appendix A) stated that the 110(a)(1) maintenance plan is required for those areas that are designated as attainment/unclassifiable for the 1997 8-hour ozone standard and are designated as attainment for the 1-hour ozone standard with an approved maintenance plan. Therefore, a 110(a)(1) maintenance plan is required for the Triad 1-hour ozone maintenance counties.

The requirements for the maintenance plan include the following:

- Attainment Emissions Inventory: The attainment emissions inventory should be based on actual "typical summer day" emissions of VOCs and NOx. The attainment inventory year may be one of any of the three years on which the 8-hour attainment designation was based.

- Maintenance Demonstration: The maintenance plan demonstrates how the area will remain in compliance with the 8-hour ozone standard for the 10-year period following the effective date of designation as attainment/unclassifiable. The future inventory year is 10

years from the effective date of the attainment designation. The maintenance plan compares the emissions for the future inventory year to the attainment inventory year. If the future inventory year emissions do not exceed the attainment year emissions then maintenance is demonstrated.

- Ambient Air Quality Monitoring: The state should continue to operate air quality monitors in accordance with 40 CFR 58 to verify maintenance of the 1997 8-hour ozone standard in the area. Any modification to the ambient air monitoring network should be accomplished through close consultation with the USEPA Regional Office.

- Contingency Plan: The state must develop a contingency plan that, at a minimum, will ensure that any violation of the 1997 8-hour ozone NAAQS is promptly corrected.

- Verification of Continued Attainment: The submittal should indicate how the state will track the progress of the maintenance plan. States should develop interim emission projection year(s) to show a trend analysis for maintenance of the standard.

In the sections that follow, the North Carolina Division of Air Quality (NCDAQ) will provide the technical data necessary to show that the Greensboro/Winston-Salem/High Point area is expected to maintain the 1997 8-hour ozone standard and has met the requirements of the 110(a)(1) maintenance plan.

2.0 MAINTENANCE PLAN

2.1 EMISSION INVENTORIES

The 110(a)(1) maintenance plan requires the development of an attainment inventory and a future year inventory for VOC and NOx emissions for those areas that were designated as attainment for the 1997 8-hour ozone standard and have an approved maintenance plan for the 1-hour ozone standard. The Triad 1-hour maintenance area, consisting of Davidson, Forsyth and Guilford Counties and a part of Davie County, meet the conditions that require the 110(a)(1) maintenance plan.

The attainment inventory year must be one of the three years on which the 8-hour ozone attainment designation was based. The USEPA designated the Triad area as attainment in April 2008 based on the 2005 through 2007 design value. Therefore, the attainment inventory year may be 2005, 2006 or 2007. The NCDAQ chose 2007 as the attainment inventory year since an

emissions inventory had already been developed for this year. The future inventory year is 10 years from the effective date of the attainment designation. Since the Triad area was designated as attainment in 2008, the future inventory year selected was 2018. Finally, the USEPA guidance suggested developing an emission inventory for interim years to show a trend analysis. The Triad area is an EAC area and the NCDAQ had already submitted modeling demonstrating continued maintenance of the 1997 8-hour ozone standard for the years 2012 and 2017, therefore only one interim year emission inventory was developed. Since the USEPA's Air Emissions Reporting Requirements (AERR) Rule requires a full emissions inventory to be submitted for 2011, the NCDAQ chose 2011 as the interim inventory year for this maintenance plan. This will allow the NCDAQ to compare the AERR inventory submittal to the estimates in this plan to ensure the area is on track to continue maintenance of the 1997 8-hour ozone standard.

As stated earlier, the Triad 1-hour ozone maintenance area consists of Davidson, Forsyth, and Guilford Counties and a portion of Davie County. For the purpose of this maintenance plan, an emission inventory for all of Davie County will be included.

The emissions inventories are comprised of four major types of sources: point, area, highway mobile and off-road mobile. The projected emissions inventories have been estimated using projected rates of growth in population, traffic, economic activity, and other parameters. Naturally occurring, or biogenic, emissions are not included in the emissions inventory comparison, as these emissions are outside the State's span of control.

Point sources are those stationary sources that require an air permit to operate. In general, these sources have a potential to emit more than 5 tons per year of a criteria pollutant or its precursors from a single facility. The source emissions are tabulated from data collected by direct on-site measurements of emissions or mass balance calculations utilizing emission factors from the USEPA's AP-42 or stack test results. There are usually several emission sources for each facility. Emission data is collected for each point source at a facility and the data is entered into an in-house database system. For the projected years' inventory, point sources are adjusted by growth factors based on Standard Industrial Classification codes. The growth factors are generated using the USEPA's Economic Growth Analysis System version 5.0 (E-GAS 5.0) program or using growth patterns obtained from County Business Patterns. For detailed discussion on how the point sources emission inventory was developed, see Appendix B.1. A summary of the point source emissions are presented in Table 2.1-1.

Table 2.1-1. Point Source Emissions

County	NOx Emissions (tons/day)			VOC Emissions (tons/day)		
	2007	2011	2018	2007	2011	2018
Davidson	2.73	2.89	3.20	3.83	3.85	3.94
Davie	0.06	0.06	0.06	0.19	0.19	0.19
Forsyth	2.22	2.18	2.15	4.03	4.03	4.03
Guilford	1.06	1.06	1.06	9.68	9.68	9.64
Triad Total	6.07	6.19	6.47	17.73	17.75	17.80

Area sources are those stationary sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., dry cleaners, service stations, etc.). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity such as production, number of employees, or population. These types of emissions are estimated on the county level. For the projected years' inventory, area source emissions are changed by population growth, projected production growth, or when applicable, by E-GAS 5.0 growth factors or using growth patterns obtained from County Business Patterns. For detailed discussion on how the area source emission inventory was developed, see Appendix B.2. A summary of the area source emissions are presented in Table 2.1-2.

Table 2.1-2. Area Source Emissions

County	NOx Emissions (tons/day)			VOC Emissions (tons/day)		
	2007	2011	2018	2007	2011	2018
Davidson	0.62	0.60	0.55	6.83	7.10	6.91
Davie	0.21	0.22	0.23	4.68	5.03	6.51
Forsyth	0.99	1.04	1.11	16.53	18.63	22.31
Guilford	2.01	2.01	1.99	22.62	24.20	28.80
Triad Total	3.83	3.87	3.88	50.66	54.96	64.53

For highway mobile sources, the USEPA's Motor Vehicle Emission Simulator (MOVES) mobile model is run to generate emissions. The MOVES model includes the road class vehicle miles traveled (VMT) as an input file and can directly output the estimated emissions. For the projected years' inventories, the highway mobile sources emissions are calculated by running the MOVES mobile model for the future year with the projected VMT to generate emissions that take into consideration expected Federal tailpipe standards, fleet turnover and new fuels. For

detailed discussion on how the on-road mobile emission inventory was developed, see Appendix B.3. A summary of the on-road mobile source emissions are presented in Table 2.1-3.

Table 2.1-3. Highway Mobile Source Emissions

County	NOx Emissions (tons/day)			VOC Emissions (tons/day)		
	2007	2011	2018	2007	2011	2018
Davidson	15.08	11.70	4.24	6.60	5.03	2.42
Davie	5.03	3.50	2.08	1.85	1.41	0.90
Forsyth	27.73	17.26	10.84	12.05	6.75	4.23
Guilford	42.78	32.10	18.84	17.41	12.97	7.82
Triad Total	90.62	64.56	36.00	37.91	26.16	15.37

Off-road mobile sources are equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from this category are calculated using the USEPA's NONROAD2008a nonroad mobile model, with the exception of the railroad locomotives and aircraft engine. The railroad locomotive and aircraft engine emissions are estimated by taking an activity and multiply by an emission factor. These emissions are also estimated at the county level. For the projected years' inventories, the emissions are estimated using the USEPA's NONROAD2008a nonroad mobile model, E-GAS 5.0 growth factors or projected landing and takeoff data for aircraft. A complete description of how these inventories were developed is discussed in detail in Appendix B.4. A summary of the off-road mobile source emissions are presented in Table 2.1-4.

Table 2.1-4. Off-Road Mobile Source Emissions

County	NOx Emissions (tons/day)			VOC Emissions (tons/day)		
	2007	2011	2018	2007	2011	2018
Davidson	3.56	2.75	1.89	1.97	1.52	1.02
Davie	0.78	0.63	0.38	1.32	1.16	0.83
Forsyth	4.94	3.99	2.40	3.79	2.93	2.12
Guilford	11.83	9.59	6.11	8.33	6.50	4.84
Triad Total	21.11	16.96	10.78	15.41	12.11	8.81

2.2 MAINTENANCE DEMONSTRATION

Maintenance is demonstrated when the future years total man-made emissions are less than the 2007 attainment inventory emissions. Table 2.2-1 summarizes the total man-made emissions for the Triad area. Table 2.2-2 summarizes the NOx and VOC emissions for the entire Triad maintenance area and the difference between the attainment and future inventory year. Since the future inventory emissions are less than the attainment inventory emissions, continued maintenance of the 1997 8-hour ozone standard in the Triad maintenance area is expected .

Table 2.2-1. Total Man-Made Emissions for the Triad Area

County	**NOx Emissions (tons/day)**			**VOC Emissions (tons/day)**		
	2007	**2011**	**2018**	**2007**	**2011**	**2018**
Davidson	21.99	17.94	9.88	19.23	17.50	14.29
Davie	6.08	4.41	2.75	8.04	7.79	8.43
Forsyth	35.88	24.47	16.5	36.4	32.34	32.69
Guilford	57.68	44.76	28.00	58.04	53.35	51.10
Triad Total	121.63	91.58	57.13	121.71	110.98	106.51

Table 2.2-2 Maintenance Demonstration for the Triad Area

Year	NOx TPD	VOC TPD
2007	121.63	121.71
2011	91.58	110.98
2018	57.13	106.51
Difference from 2007 to 2018	-64.50	-15.20

The difference between the attainment level of emissions from all sources and the projected level of emissions from all sources in the maintenance area is considered the “safety margin”. The safety margin for each projected year is listed below in Table 2.2-3. As can be seen in Table 2.2-3, not only does the future inventory year demonstrate maintenance of the 1997 8-hour ozone standard, the interim inventory year demonstrates a continued trend downward of the emissions.

TABLE 2.2-3 Safety Margins for the Triad Areas

Year	NOx TPD	VOC TPD
2007	N/A	N/A
2011	-30.05	-10.73
2018	-64.50	-15.2

2.3 AMBIENT AIR QUALITY MONITORING

The NCDAQ has collected ambient monitoring data for the Triad area since the late seventies. At the time of the April 2004 8-hour ozone designations, there were nine ozone monitors throughout the Triad area, with only six monitors in the Triad 1-hour maintenance counties (Figure 2.3-1). These monitors were installed in accordance with the 40 CFR 58.

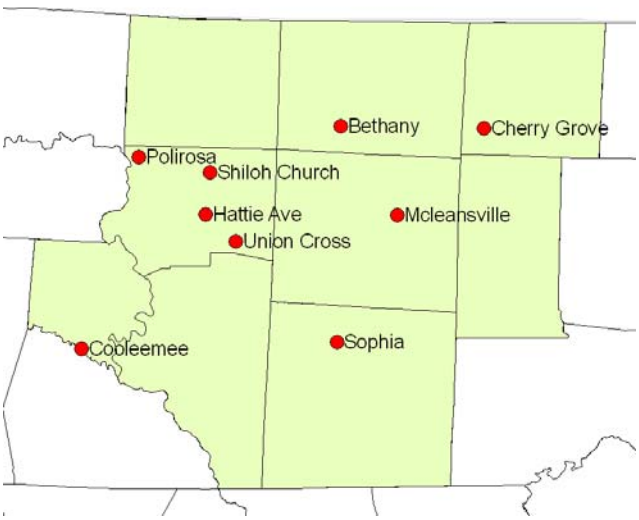

Figure 2.3-1 Historic Triad Ozone Monitoring Network

Since the 2004 designations, three of the Triad ozone monitors have moved and one monitor has shut down. In 2005, the Mendenhall monitor in Guilford County replaced the McLeansville monitor and the Forsyth County monitor at Pollirosa moved to Clemmons. Also in 2005, the Sophia monitor in Randolph County shutdown. In 2010, the Cooleemee monitor in Davie County moved to Mocksville. All of these changes to the monitoring network were done in consultation with the USEPA and in accordance with 40 CFR 58. The current monitoring locations are presented in Figure 2.3-2.

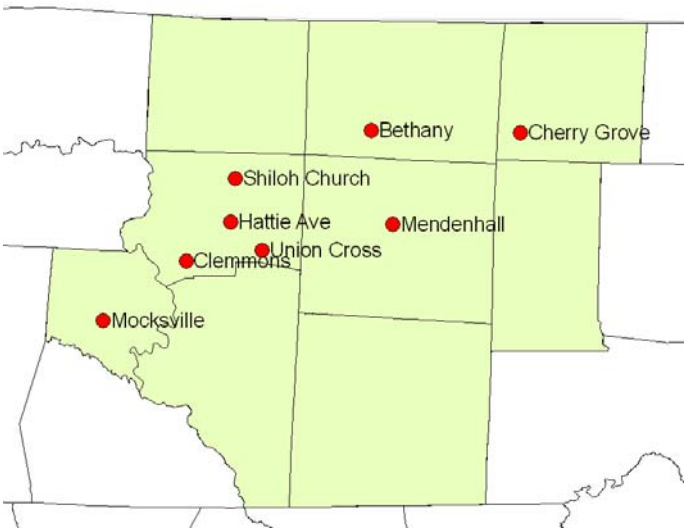

Figure 2.3-2 Current Triad Ozone Monitoring Network

Tables 2.3-1 and 2.3-2, respectively, show the 8-hour ozone air quality data and corresponding design values for the monitors in the Triad area from 2001 through 2010. As you can see from Table 2.3-2, all of the monitors in the Triad area have continued to maintain the 1997 8-hour ozone standard since being designated attainment in 2008.

Table 2.3-1 Triad Area's 4th Highest 8-hour Ozone Values (2001-2010)

Monitor	4th Highest 8-hour Ozone Values (ppm)									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cooleemee Davie County	0.094	0.098	0.089	0.073	0.084	0.080	0.085	0.081	0.068	---
Mocksville Davie County	---	---	---	---	---	---	---	---	---	0.072
Hattie Ave. Forsyth County	0.094	0.099	0.087	0.075	0.074	0.082	0.082	0.081	0.068	0.081
Union Cross Forsyth County	0.094	0.093	0.081	0.078	0.080	0.082	0.083	0.078	0.068	0.078
Shiloh Church Forsyth County	0.096	0.094	0.074	0.071	0.078	0.067	0.076	0.077	0.066	0.076
Cherry Grove Caswell County	0.087	0.095	0.083	0.074	0.076	0.075	0.082	0.080	0.067	0.073
McLeansville Guilford County	0.086	0.104	0.079	0.071	0.081	---	---	---	---	---
Mendenhall Guilford County	---	---	---	---	0.082	0.080	0.086	0.081	0.072	0.076
Bethany Rockingham County	0.094	0.096	0.083	0.074	0.078	0.075	0.082	0.084	0.068	0.074

Table 2.3-1 Continued: Triad Area's 4th Highest 8-hour Ozone Values (2001-2010)

Monitor	4th Highest 8-hour Ozone Values (ppm)									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sophia Randolph County	0.085	0.092	0.078	0.076	---	---	---	---	---	---
Pollirosa Forsyth County	0.082	0.088	0.078	0.072	---	---	---	---	---	---
Clemmons Forsyth County	---	---	---	---	0.075	0.077	0.078	0.078	0.062	0.081

Table 2.3-2 Triad Area's Design Values (2001-2010)

Monitor	Design Value (ppm)							
	01-03	02-04	03-05	04-06	05-07	06-08	07-09	08-10
Cooleemee Davie County	**0.093**	**0.086**	0.082	0.079	0.083	0.082	0.078	---
Mocksville Davie County	---	---	---	---	---	---	---	---
Hattie Ave. Forsyth County	**0.093**	**0.087**	0.078	0.077	0.079	0.081	0.077	0.076
Union Cross Forsyth County	**0.089**	0.084	0.079	0.080	0.081	0.081	0.076	0.074
Shiloh Church Forsyth County	**0.088**	0.079	0.074	0.072	0.073	0.073	0.073	0.073
Cherry Grove Caswell County	**0.088**	0.084	0.077	0.075	0.077	0.079	0.076	0.073
McLeansville Guilford County	**0.089**	0.084	0.077	0.076	---	---	---	---
Mendenhall Guilford County	---	---	---	0.081	0.082	0.082	0.079	0.076
Bethany Rockingham County	**0.091**	0.084	0.078	0.075	0.078	0.080	0.078	0.075
Sophia Randolph County	**0.085**	0.082	---	---	---	---	---	---
Pollirosa Forsyth County	0.082	0.079	---	---	---	---	---	---
Clemmons Forsyth County	---	---	---	0.076	0.076	0.077	0.072	0.073

Bold values indicates violations of the 1997 8-hour ozone standard
---- indicates no data to calculate design value
Underlined data indicates fewer than three years or previous site data in design value calculation

Ambient air quality monitoring is one of the requirements of Section 110 of the Clean Air Act. The NCDAQ commits to continue operating the current ozone monitors in the Triad 8-hour ozone attainment area, provided sufficient funding is available for continued operation. Any monitor shutdowns or relocations will only be made with the approval of the USEPA. No plans are underway to discontinue operation, relocate or otherwise affect the integrity of the ambient monitoring network in place. The current monitors are operated consistent with 40 CFR 58 and any changes will only be made if they are consistent with 40 CFR 58.

2.4 CONTINGENCY PLAN

2.4.1 Overview

The two main elements of the North Carolina contingency plan are tracking and triggering mechanisms to determine when contingency measures are needed and a process of developing and adopting appropriate control measures. There will be three triggers for the contingency plan. The primary trigger of the contingency plan will be a violation of the 1997 8-hour ozone NAAQS at any of the Triad area monitors. The secondary trigger will be a monitored air quality pattern that suggests an actual 1997 8-hour ozone NAAQS violation may be imminent. The tertiary trigger will be a monitored fourth high exceedance of the NAAQS. Upon either the primary or secondary triggers being activated, the NCDAQ will commence analyses to determine what additional measures, if any, will be necessary to attain or maintain the 1997 8-hour ozone standard. If activation of either the primary or secondary triggers occurs, this plan provides a regulatory adoption process for revising emission control strategies. Activation of the tertiary trigger will result in an analysis to understand the cause of the exceedance and to identify voluntary measures if needed.

In addition, there will be a tracking mechanism that requires a comparison of the actual emissions inventory submitted under the AERR to the projected inventories, and to the attainment year inventory contained in this maintenance plan. The AERR reporting years coincides with the interim year and is within one year of the final year of the emission inventories in this maintenance demonstration.

2.4.2 Primary and Secondary Triggers

The primary trigger of the contingency plan will be a violation of the 1997 8-hour ozone standard, or when the three-year average of the 4th highest values is equal to or greater than 0.085 ppm at a monitor in the Triad maintenance area. The trigger date will be 60 days from the date that the State observes a 4th highest value that, when averaged with the two previous ozone

seasons' fourth highest values, would result in a three-year average equal to or greater than 0.085 ppm.

The secondary trigger will apply where no actual violation of the 1997 8-hour ozone standard has occurred, but where the State finds monitored ozone levels indicating that an actual ozone NAAQS violation may be imminent. A pattern will be deemed to exist when there are two consecutive ozone seasons in which the 4th highest values are 0.085 ppm or greater at a single monitor within the Triad maintenance area. The trigger date will be 60 days from the date that the State observes a 4th highest value of 0.085 ppm or greater at a monitor for which the previous season had a 4th highest value of 0.085 ppm or greater.

Similarly, the tertiary trigger will not be an actual violation of the 1997 8-hour ozone standard. This trigger will be a first alert as to a potential air quality problem on the horizon. The trigger will be activated when a monitor in the Triad maintenance area has a 4th highest value of 0.085 ppm or greater, starting the first year after the maintenance plan has been approved. The trigger date will be 60 days from the date that the State observes a 4th highest value of 0.085 ppm or greater at any monitor.

2.4.3 Action Resulting From Trigger Activation

Once the primary or secondary trigger is activated, the Planning Section of the NCDAQ shall commence analyses including trajectory analyses of high ozone days, and emissions inventory assessment to determine those emission control measures that will be required for attaining or maintaining the 1997 8-hour ozone standard. By May 1 of the year following the ozone season in which the primary or secondary trigger has been activated, North Carolina will complete sufficient analyses to begin adoption of necessary rules for ensuring attainment and maintenance of the 1997 8-hour ozone NAAQS. The rules would become State effective by the following January 1, unless legislative review is required.

The measures that will be considered for adoption upon a trigger of the contingency plan include: NOx Reasonably Available Control Technology on stationary sources in the Triad maintenance area, diesel inspection and maintenance program, implementation of diesel retrofit programs, including incentives for performing retrofits, and additional controls in upwind areas.

The NCDAQ commits to implement within twenty-four months, or as expeditiously as practicable, at least one of the control measures listed above, or other contingency measures that may be determined to be more appropriate based on the analysis performed,.

Once the tertiary trigger is activated, the Planning Section of the NCDAQ shall commence analyses including meteorological evaluation, trajectory analyses of high ozone days and emissions inventory assessment to understand why a 4th highest exceedance of the standard has occurred. Once the analyses are completed, the NCDAQ will work with the local air awareness program and develop an outreach plan to identify any additional voluntary measures that can be implemented. If the 4th highest exceedance occurs early in the season, the NCDAQ will work with entities identified in the outreach plan to determine if the measures can be implemented during the current season, otherwise, NCDAQ will work with the local air awareness coordinator to implement the plan for the following ozone season.

2.5 VERIFICATION OF CONTINUED ATTAINMENT

In addition to the contingency measures listed above, the 110(a)(1) maintenance plan should indicate how the state will track the progress of the maintenance plan. For the verification of continued attainment, the NCDAQ will carry out emission inventory comparisons. The large stationary sources are required to submit an emission inventory annually to the NCDAQ. The NCDAQ will commit to review these emissions inventories to determine if an unexpected growth in NOx emissions in the Triad area may endanger the maintenance of the 1997 8-hour ozone standard. Additionally, as new VMT data is provided by the North Carolina Department of Transportation, the NCDAQ commits to review this data and determine if any unexpected growth in VMT may endanger the maintenance of the 1997 8-hour ozone standard.

Additionally, under the AERR the NCDAQ is required to develop a comprehensive, annual, statewide emissions inventory every three years and is due twelve to eighteen months after the completion of the inventory year. The AERR inventory years coincides with the interim year and is within a year of the final year of the maintenance plan. Therefore, the NCDAQ commits to compare the AERR inventories, as they are developed, with the maintenance plan to determine if additional steps are necessary for continued maintenance of the 1997 8-hour ozone standard in this area.

3.0 CONCLUSION

The emission inventory comparison demonstrates that the estimated emissions are expected to decrease from the attainment inventory year through the end future year. Additionally, the ambient air quality data demonstrates that the Triad maintenance area has continued to maintain, and is well below, the 1997 8-hour ozone standard. The NCDAQ has developed a contingency plan based on a number of triggers and tracking mechanisms that will ensure that the Triad area continues to maintain the 1997 8-hour ozone NAAQS. Therefore, with this submission, the

NCDAQ believes the requirements of the Section 110(a)(1) maintenance plan for the 1997 8-hour ozone standard have been met.