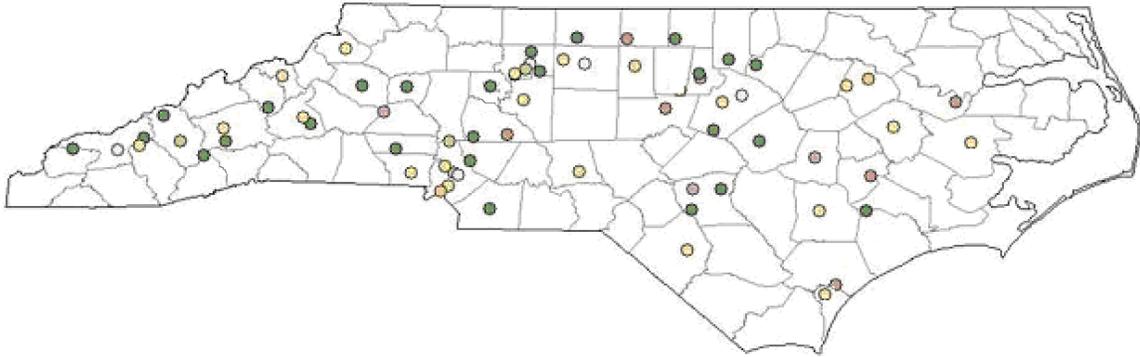


2014-2015 Annual Monitoring Network Plan for the North Carolina Division of Air Quality

Volume 1 Network Descriptions



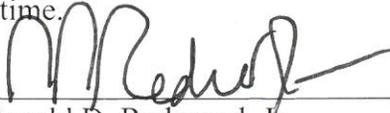
October 10, 2014

North Carolina Division of Air Quality
A Division of the North Carolina Department
of Environment and Natural Resources
Mail Service Center 1641
Raleigh, North Carolina 27699-1641



CERTIFICATION

By the signatures below, the North Carolina Division of Air Quality (NC-DAQ) certifies that the information contained in the 2014-2015 Annual Monitoring Network Plan is complete and accurate at the time of submittal to EPA Region 4. However, due to circumstances that may arise during the sampling year, some network information may change. A notification of change and a request for approval will be submitted to EPA Region 4 at that time.

Signature 
Donald D. Redmond, Jr.
Ambient Monitoring Section Chief, NC-DAQ

Date 10/10/14

Signature 
Sheila C. Holman
Director, NC-DAQ

Date 10/10/14

I. Introduction

The North Carolina Division of Air Quality (NC-DAQ) works with the state's citizens to protect and improve outdoor, or ambient, air quality in North Carolina for the health and benefit of all. To carry out this mission, the NC-DAQ has programs for monitoring air quality, permitting and inspecting air emissions sources, developing plans for improving air quality and educating and informing the public about air quality issues.

The NC-DAQ, which is part of the N.C. Department of Environment and Natural Resources (DENR), also enforces state and federal air pollution regulations. In North Carolina, the General Assembly enacts state air pollution laws and the Environmental Management Commission adopts most regulations dealing with air quality. In addition, the U.S. Environmental Protection Agency (EPA) has designated the NC-DAQ as the lead agency for enforcing federal laws and regulations dealing with air pollution in North Carolina.

The Ambient Monitoring Section (AMS) of the NC-DAQ operates an air quality-monitoring program for the state. The AMS is responsible for measuring levels of regulated pollutants in the ambient (outdoor) air by maintaining a network of 60 monitoring stations across the state and measuring the concentration of pollutants such as ozone, lead, particles (dust), nitrogen oxides, sulfur dioxide and carbon monoxide. The AMS provides these monitoring services in accordance with U.S. EPA regulatory requirements. The criteria pollutant monitoring system is designed to make measurements to assess compliance with the National Ambient Air Quality Standards (NAAQS) as set by the EPA. The NAAQS define air pollutant concentration level thresholds judged necessary to protect the public health and welfare.

The law as defined in Title 40 of the Code of Federal Regulations (CFR) Part 58.10 *Annual Monitoring Network Plan and Periodic Network Assessment* requires an annual monitoring network plan. This plan must provide the following information for each monitoring station in the network:

- The Air Quality System (AQS) site identification number;
- The location, including street address and geographical coordinates;
- The sampling and analysis method(s) for each measured parameter;
- The operating schedules for each monitor;
- Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal;
- The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part;
- The identification of any sites that are suitable and sites that are not suitable for comparison against the annual fine particle (PM_{2.5}) NAAQS as described in §58.30; and
- The Metropolitan Statistical Area (MSA), Core-Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.
- The designation of any lead (Pb) monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR Part 58.

- Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
- Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.
- The identification of required nitrogen dioxide (NO₂) monitors as either near-road or area-wide sites in accordance with appendix D, section 4.3 of this part.

This plan contains information on the criteria pollutant monitoring networks operated by the NC-DAQ and continues in the following sections outlined below:

- II. Summary of Proposed Changes
- III. Carbon Monoxide (CO) Monitoring Network
- IV. Sulfur Dioxide Monitoring Network
- V. Ozone Monitoring Network
- VI. Particle Monitoring Network for Particles with Aerodynamic Diameters of 10 Micrometers or Less (PM₁₀)
- VII. Fine Particle (PM_{2.5}) Monitoring Network
- VIII. Lead Monitoring Network
- IX. Urban Air Toxics Monitoring Network
- X. NC-DAQ NCore Monitoring Network
- XI. Nitrogen Dioxide Monitoring Network
- XII. EPA Approval Dates for Quality Management Plan and Quality Assurance Project Plans
- XIII. Equipment Condition of North Carolina Monitoring Sites

A table summarizing the monitoring network and providing the types of monitors operated at each station is provided in Appendix A. Summary of Monitoring Sites and Types of Monitors. The annual network review forms filled out each year for each of the monitoring sites operated by the NC-DAQ and the Western North Carolina Regional Air Quality Agency are attached as an appendix to each regional section in Volume 2 and are also available for review at the Division of Air Quality, 217 West Jones Street, Raleigh, North Carolina, 27603. The Mecklenburg County Air Quality 2014 Annual Monitoring Network Plan is provided in Appendix B. The Forsyth County Office of Environmental Assistance and Protection 2014 Annual Monitoring Network Plan is provided in Appendix C.

Volume II of the annual network plan discusses the monitoring network by Metropolitan Statistical Areas (MSAs) organized by the area of the state in which they are located. The day-to-day operations of the monitors are managed by regional office monitoring staff located in one of the seven regional Division of Air Quality Offices located in Asheville, Mooresville, Winston-Salem, Raleigh, Fayetteville, Washington and Wilmington. Volume II of the monitoring plan discusses the monitoring network for each regional office starting with Asheville in the west and moving to Wilmington in the east. Each region is subdivided into sections based on Metropolitan Statistical Areas. Volume II discusses the current monitoring as well as future monitoring plans or needs.

In February of 2013 the Office of Management and Budget revised the definitions of MSAs based on the 2010 census as shown in Figure 1.¹ As a result of these revisions, North Carolina gained two MSAs in the eastern part of the state: Myrtle Beach-Conway-North Myrtle Beach and New Bern. Three MSAs gained additional counties and, thus, additional people— Charlotte-Concord-Gastonia, Virginia Beach-Norfolk-New Port News and Winston-Salem. Two MSAs lost counties and, thus, people – Greenville and Wilmington. The discussions in this network monitoring plan are based on the 2013 MSA definitions.



Figure 1. North Carolina Metropolitan Statistical Areas as of February 2013

¹ Office of Management and Budget, OMB BULLETIN NO. 13-01: Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas and Combined Statistical Areas and Guidance on Uses of the Delineations of These Areas, February 28, 2013, available on the worldwide web at <http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf>, accessed March 22, 2013.

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II. Summary of Proposed Changes

This section lists the known changes to the network expected to occur during the next 18 months. It also includes a list of required near road monitors that will be required in 2017 according to 40 CFR 58 Appendix D 4.3.2 (a). Table 1 contains a list of fastest growing counties in North Carolina for reference in the discussions in this section and the following sections of the report, which describe monitoring changes required because of population growth in the MSA. The discussion in this section is organized as follows:

- Monitors scheduled to start-up or shut-down in 2014 or 2015;
- Sites to be relocated or moved in 2014;
- Changes to the Methods Used to Measure Fine Particles for Comparison to the NAAQS;
- Rotating Background Monitors and their Operating Schedules; and
- Current Requirement for Near Road Monitoring in 2017.

Table 1. Alphabetical List of Fastest Growing Counties in North Carolina based on population change between April 1, 2010, or July 1, 2012 and July 1, 2013.

County Name	Population Estimate July 1, 2013	State Ranking of Counties by 2013 Estimate	Reason for Selection as one of the Fastest Growing Counties in North Carolina
Brunswick	115,301	25	Growth of 2.8 % from 2012 to 2013 and 7.3 % from April 1, 2010, to July 1, 2013. Nation's 47 th (annual) & 64 th (decade) fastest growing county.
Durham	288,133	6	Growth of 6,052 people from 2012 to 2013 and 20,546 people from April 1, 2010, to July 1, 2013. Nation's 94 th (annual) and 88 th (decade) fastest growing county (percentagewise).
Guilford	506,610	3	Growth of 5,592 people from 2012 to 2013 and 18,204 people from April 1, 2010, to July 1, 2013.
Harnett	124,987	23	Growth of 2.3 % from 2012 to 2013 and 9.0 % between 4/1/2010 and 7/1/2013. Nation's 78 th (annual) and 41 st fastest growing county.
Hoke	51,322	54	Growth of 9.3 % between April 1, 2010 and July 1, 2013. Nation's 32 nd fastest growing county.
Mecklenburg	990,997	1	Growth of 23,006 people (2.4 %) from 2012 to 2013 and 71,349 people (7.8 %) between 4/1/2010 and 7/1/2013. Nation's 74 th (annual) and 58 th (decade) fastest growing county (percentagewise).
New Hanover	213,267	8	Growth of 3,121 people from 2012 to 2013 and 10,600 people from April 1, 2010, to July 1, 2013.
Pender	55,334	51	Growth of 2.1 % from July 1, 2012 to July 1, 2013. Nation's 98 th fastest growing county.

Table 1. Alphabetical List of Fastest Growing Counties in North Carolina based on population change between April 1, 2010, or July 1, 2012 and July 1, 2013.

County Name	Population Estimate July 1, 2013	State Ranking of Counties by 2013 Estimate	Reason for Selection as one of the Fastest Growing Counties in North Carolina
Union	212,756	9	Growth of 4,258 people from 2012 to 2013 and 11,464 people from April 1, 2010, to July 1, 2013.
Wake	974,289	2	Growth of 22,146 people (2.3 %) from 2012-2013 & 73,296 people (8.1 %) from 4/1/10-7/1/13. Nation's 79 th (annual) & 54 th (decade) fastest growing county.

A. Monitors Scheduled to Start Up or Shut Down in 2014 or 2015

Table 2 presents a list of monitors that are expected to start-up or shut-down in 2014 listed by Metropolitan Statistical Area (MSA) and AQS Site Identification Number. Changes to the monitors operated by Mecklenburg County Air Quality are discussed in Appendix B. 2014 Annual Monitoring Network Plan for Mecklenburg County Air Quality. The only changes discussed here are those applying to the eight monitoring sites listed in the table that are operated by the NC-DAQ.

Table 2. Summary of Monitors Scheduled to Start Up or Shut Down in 2014 or 2015

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370710016	Grier School	PM2.5	FRM & TEOM monitors no longer needed & will shut down	12/31/2014
		WS/WD	Sensors no longer needed to support PM2.5 monitoring	12/31/2014
37119044	Remount Road	NO ₂	A near-road NO2 monitor began operating to meet Appendix D requirements	6/01/2014
371590021	Rockwell	Reactive Oxides of Nitrogen	Monitor was upgraded to an i-series trace level unit	12/5/2013
		Speciation	The SASS and URG monitors will shut down	12/31/2014

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370690001	Franklinton	Ozone	Monitor is no longer needed and will shut down	10/31/2014
371830014	Millbrook	NO ₂	An area-wide Photolytic NO2 monitor began operating to meet Appendix D requirements	12/18/2013
		Carbonyls	Carbonyl sampling resumed	07/03/2013
		PM10	Collocated low volume PM10 will be added to meet Appendix A requirements	01/01/2015
371830021	Triple Oak Road	NO ₂	A near-road NO2 monitor began operating	01/08/2014

Greensboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370830014	Colfax	PM2.5	FRM Monitor is no longer required and will shut down	12/31/2014
		WS/WD	Sensors no longer needed to support PM2.5 monitoring	12/31/2014

Table 2. Summary of Monitors Scheduled to Start Up or Shut Down in 2014 or 2015

Winston-Salem Metropolitan Statistical Area

AQS Site Id No.	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370570002	Lexington	Speciation	The SASS and URG monitors will shut down	12/31/2014
370590003	Mocksville	Ozone	Monitor is no longer needed and will shut down	10/31/2014

Durham Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370370004	Pittsboro	PM2.5	FRM Monitor is no longer required and will shut down	12/31/2014
370630015	Durham Armory	PM2.5	TEOM will be replaced with a BAM	12/31/2014
		PM10	Manual monitor will be replaced with a BAM	12/31/2014
371450003	Bushy Fork	Ozone	Monitor is no longer needed and will shut down	10/31/2014
		SO2	Monitor started operating to collect background data	6/1/14 to 5/31/15

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370210034	Board of Ed	PM2.5	FRM and collocated FRM monitor will shut down	12/31/2014
		Speciation	The SASS and URG monitors will shut down	12/31/2014

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370510009	William Owen	PM10	Collocated monitor from Hickory will be relocated here	1/1/2015

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370350004	Hickory	PM10	Monitor is no longer needed and will shut down; the collocated monitor will be relocated to William Owen	12/31/2014
		Speciation	The SASS and URG monitors shut down	5/31/2014

Burlington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370010002	Hopedale	PM2.5	FRM monitor is are no longer needed and will shut down	12/31/2014

Goldsboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371910005	Dillard School	PM2.5	FRM & BAM are no longer required & will shut down	12/31/2014
		WS/WD	Sensors no longer needed to support PM2.5 monitoring	12/31/2014

**Table 2. Summary of Monitors Scheduled to Start Up or Shut Down in 2014 or 2015
Not In A Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites**

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371050002	Black-stone	Ozone	Monitor started to measure background concentrations	11/5/2013
		PM2.5	BAM monitor started to measure background concentrations	1/1/2014
		SO2	Monitor will start to measure background concentrations	9/1/2014
		NO2	Monitor will start to measure background concentrations	9/1/2014
		Air Toxics	VOC & carbonyl monitoring to measure background concentrations	11/6/2013
		Hydrocarbons	Monitoring started to measure background concentrations	11/6/2013
		WS/WD	Sensors started to support background concentration study	1/16/2014
371230001	Candor	PM2.5	BAM monitor started for comparison with the FRM	8/1/2013
		Air Toxics	Carbonyl monitoring to measure background concentrations	6/3/2013
371550005	Linkhaw	PM2.5	Monitor is less than 80% of NAAQS and will shut down	12/31/2014
371730002	Bryson City	SO2	Monitor started operating to collect background data	9/1/2014 to 8/31/2015

^a Operated by Mecklenburg County Air Quality

1. Monitoring Changes in the Charlotte-Concord-Gastonia MSA

At the **Grier School** (37-071-0016) site in Gaston County, the NC-DAQ operates a one-in-six day fine particle FRM monitor, a continuous fine particle monitor and a wind speed and wind direction sensor. This entire site will shut down on December 31, 2014. Both monitors are not required by 40 CFR 58 Appendix D, the NC-DAQ no longer needs the continuous monitor at the site for air quality forecasting and because of the lower fine particle concentrations throughout the state, the monitors are no longer needed to ensure an adequate fine particle network. The site is shown in Figure 2.



Figure 2. The Grier School Fine Particle Monitoring Site

At the **Rockwell** (37-159-0021) site in Rowan County, the NC-DAQ operates a year-round ozone monitor, one-in-three day fine particle FRM monitor, a one-in-six day collocated fine particle monitor, a continuous fine particle monitor and one-in-six day speciation fine particle monitors. In addition a high sensitivity reactive oxides of nitrogen monitor operated year round at this site until mid May 2013, when it was shut

down because it was not operating properly. On December 5, 2013, this monitor was upgraded to a trace level monitor. A continuous fine particle nitrate monitor and aethalometer also operate year-round here. In early 2012, the NC-DAQ decided to add a continuous sulfate monitor to this site. To make resources available to operate the continuous sulfate monitor, the NC-DAQ shut down the carbon monoxide monitor at the end of June 2012. Installation of the continuous sulfate monitor continues to be on hold. The EPA Office of Air Quality Planning and Standards (OAQPS) plans to end the funding for the analysis of the samples from the one-in-six day speciation monitors at the end of 2014. The NC-DAQ plans to shut down those speciation monitors when the funding ends. The site is shown in Figure 3.



Figure 3. The Rockwell Ozone, Particle and Precursor Monitoring Site

2. Changes to Monitoring in the Raleigh MSA

In the Raleigh MSA, ozone monitoring will end at one site (Franklinton), nitrogen dioxide monitoring started at two sites (Millbrook and Triple Oak Road) and carbonyl sampling started at Millbrook. At the **Franklinton** (37-069-0001) site in Franklin County the NC-DAQ operates a seasonal ozone monitor. This entire site will shut down on October 31, 2014. The ozone monitor is not required by 40 CFR 58 Appendix D, the NC-DAQ can continue doing air quality forecasting without the monitor and because of our knowledge about ozone concentrations throughout the state, the monitor is no longer needed to ensure an adequate ozone network. The site is shown in Figure 4.



Figure 4. The Franklinton Ozone Monitoring Site

At the **Millbrook** (37-183-0014) site, the NC-DAQ operates a year-round ozone monitor, one-in-three day fine particle Federal Reference Method (FRM), low-volume manual PM₁₀ and manual fine particle speciation monitors, one continuous fine particle Federal Equivalent Method (FEM) monitor, trace-level sulfur dioxide, carbon monoxide and reactive oxides of nitrogen monitors and air toxics volatile organic compound and carbonyl monitors. The NC-DAQ also operates continuous fine particle monitors for sulfate, nitrate and black carbon at this site. The site is shown in Figure 5. Because the Millbrook site is an NCore site, the NC-DAQ began analyzing the low-volume PM₁₀ samples for lead, starting December 27, 2011. The NC-DAQ began operating a fine particle Beta Attenuation Monitor (BAM) at the site as an FEM in January 2011. July 3, 2013, the NC-DAQ began operating a carbonyl sampler at the site to support shale gas development background monitoring studies in Lee County. December 18, 2013, the NC-DAQ also began operating an area wide photolytic nitrogen dioxide monitor at the site to meet the requirements in 40 CFR 58 Appendix D. At the end of 2014 or beginning of 2015 the NC-DAQ will add a collocated low-volume PM₁₀ monitor to meet Appendix A collocation requirements for manual PM₁₀ monitors.



Figure 5. Millbrook NCore Monitoring Site

At the new **Triple Oak Site**, the NC-DAQ is operating a near road nitrogen dioxide monitoring site. The site was established in collaboration with the U.S. EPA Office of Research and Development (ORD) and will be a multi-pollutant site. The photolytic nitrogen dioxide monitor started operating on January 8, 2014. A trace level carbon monoxide monitor and a fine particle monitor will be added by January 1, 2017. The NC-DOT currently operates a traffic counter at the site. The U.S. EPA also plans to operate a wide suite of monitors at this site, including air toxics monitors, continuous fine particle monitors and meteorological sensors.

3. Monitoring Changes in the Greensboro MSA

At the **Colfax** (37-083-0014) site in Guilford County, the NC-DAQ operates a one-in-three day fine particle FRM monitor and a wind speed and wind direction sensor. This entire site will shut down on December 31, 2014. The FRM monitor is no longer required by 40 CFR 58 Appendix D and because of the lower fine particle concentrations throughout the state, the monitor is no longer needed to ensure an adequate fine particle network. The site is shown in Figure 6.

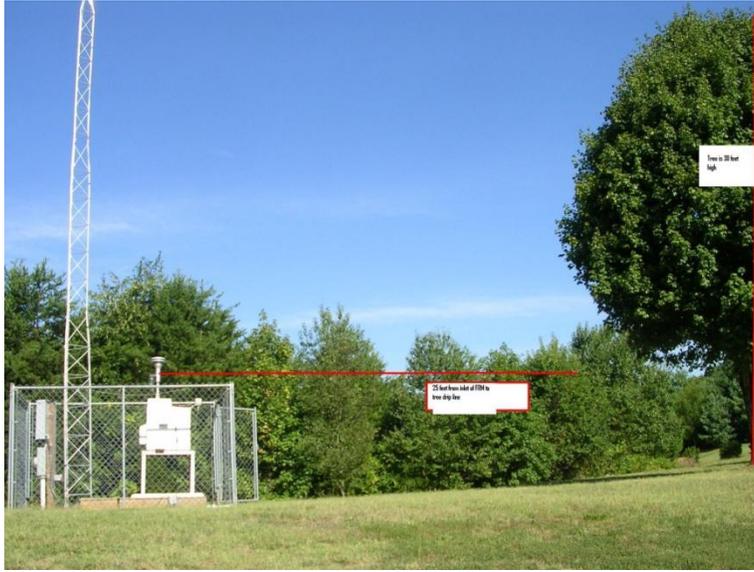


Figure 6. The Colfax Fine Particle Monitoring Site

4. Monitoring Changes in the Winston-Salem MSA

At the **Lexington** (37-057-0002) site in Davidson County, the NC-DAQ operates a one-in-three day fine particle FRM monitor, one-in-six day MetOne Super SASS and URG 3000N speciation fine particle monitors and a continuous fine particle monitor. The MetOne and URG monitors will be shut down at the end of 2014. The OAQPS plans to end the funding for the analysis for these speciation monitors so the NC-DAQ decided to shut these monitors down. The site is shown in Figure 7.



Figure 7. The Lexington Fine Particle Monitoring site

At the **Mocksville** (37-059-0003) site in Davie County, the NC-DAQ operates an ozone monitor. This entire site will shut down on October 31, 2014. The ozone monitor is not required by 40 CFR 58 Appendix D, the NC-DAQ can continue ozone air quality forecasting without this monitor and because of our increased knowledge regarding ozone formation and transportation throughout the state, the monitor is no longer needed to ensure an adequate fine particle network. The site is shown in Figure 8.



Figure 8. The Mocksville Ozone Monitoring Site

5. Monitoring Changes in the Durham-Chapel Hill MSA

In the Durham-Chapel Hill MSA, monitors will be shut down at the Pittsboro site in Chatham County and the Bushy Fork site in Person County. Also, sulfur dioxide monitoring started at Bushy Fork to provide background sulfur dioxide data for Person County. At **Pittsboro** (37-037-0004), the NC-DAQ operates a one-in-three day fine particle FRM monitor and a seasonal ozone monitor. On December 31, 2014, the NC-DAQ will shut down the fine particle monitor. This monitor is no longer required by 40 CFR 58 Appendix D. Because of lower fine particle concentrations throughout the state, the monitor is no longer needed to ensure an adequate fine particle network. The seasonal ozone monitor will continue to operate. It is one of two ozone monitors required by 40 CFR 58 Appendix D for the Durham Chapel Hill MSA. Figure 9 shows the site.



Figure 9. The Pittsboro Ozone and Fine Particle Monitoring Site

At the **Durham Armory** site, the NC-DAQ operates a seasonal ozone monitor, a sulfur dioxide population-weighted emission index monitor, a one-in-three day fine particle monitor, a continuous fine particle monitor and a one-in-three day low volume PM₁₀ monitor that is also used with the PM_{2.5} monitor to measure PM_{10-2.5}. Before the end of 2014 the continuous fine particle monitor and low volume PM₁₀ monitor will be replaced with Beta Attenuation Monitors (BAMs) designed to measure continuous PM_{10-2.5}.

At the **Bushy Fork** (37-145-0003) site in Person County, the NC-DAQ operates a seasonal ozone monitor and a temporary special purpose background sulfur dioxide monitor. The seasonal ozone monitor at this site will shut down on October 31, 2014. The ozone monitor is not required by 40 CFR 58 Appendix D, the NC-DAQ can continue air quality forecasting without the monitor and the monitor is no longer needed to ensure an adequate ozone network. The sulfur dioxide monitor will start in June 2014 and operate for one year to provide background sulfur dioxide concentrations. The site is shown in Figure 10.



Figure 10. The Bushy Fork Ozone and Sulfur Dioxide Monitoring Site

6. Monitoring Changes in the Asheville MSA

At the **Board of Education** (37-021-0034) site in Buncombe County, the Western North Carolina Regional Air Quality Agency (WNCRAQA) operates one-in-three and one-in-six day fine particle FRM monitors, a continuous fine particle monitor and one-in-six day speciation monitors. On December 31, 2014, the WNCRAQA will shut down the two FRM monitors and the SASS and URG speciation monitors. The FRM monitors are not the design value monitors for the MSA and are not required by 40 CFR 58 Appendix A or D. The OAQPS plans to end funding for the analysis for the speciation monitors so the WNCRAQA and NC-DAQ decided to shut these monitors down.

7. Monitoring Changes in the Fayetteville MSA

At the **William Owen School** (37-071-0016) site in Cumberland County, the NC-DAQ operates a one-in-six day fine particle FRM monitor, a continuous fine particle monitor, a one-in-six day PM₁₀ monitor, wind speed and wind direction and air temperature and relative humidity sensors, a solar radiation sensor and a rain gauge. On January 1, 2015, the NC-DAQ will begin operating a collocated PM₁₀ monitor at this site to replace the collocated PM₁₀ monitor at the Hickory site. The collocated monitor is required by 40 CFR 58 Appendix A. The site is shown in Figure 11.



Figure 11. The William Owen School Particle Monitoring Site

7. Monitoring Changes in the Hickory MSA

At the **Hickory** (37-035-0004) site in Catawba County, the NC-DAQ operates a one-in-three and a one-in-six day fine particle FRM monitor, a continuous fine particle monitor, two fine particle speciation one-in-six day monitors and two one-in-six day PM10 monitors. Both one-in-six day PM10 monitors will shut down on December 31, 2014. The PM10 monitor is not required by 40 CFR 58 Appendix D, the NC-DAQ does not use the PM10 data from this site for permit modeling and the monitor is no longer needed to ensure an adequate PM10 network. The SASS and URG speciation monitors were shut down in late May 2014 because the SASS monitor broke, the OAQPS planned on ending funding at the end of 2014 and the NC-DAQ decided the monitor was not worth repairing. The site is shown in Figure 12.



Figure 12. The Hickory Particle Monitoring Site

8. Monitoring Changes in the Burlington MSA

At the **Hopedale** (37-001-0002) site in Alamance County, the NC-DAQ operates a one-in-six day fine particle FRM monitor, a continuous fine particle monitor and a wind speed and wind direction sensor. The one-in-six day fine particle FRM monitor will shut down on December 31, 2014. This monitor is no longer required by 40 CFR 58 Appendix D. The NC-DAQ and Forsyth County continue to use the continuous monitor at the site for air quality forecasting. Also, the site will become an ozone site sometime in the future if the EPA requires ozone monitoring in the Burlington MSA. The site is shown in Figure 13.



Figure 13. The Hopedale Fine Particle Monitoring Site

9. Monitoring Changes in the Goldsboro MSA

At the **Dillard School** (37-191-0005) site in Wayne County, the NC-DAQ operates a one-in-three day fine particle FRM monitor, a continuous fine particle FEM monitor and a wind speed and wind direction sensor. This entire site will shut down on December 31, 2014. Both monitors are not required by 40 CFR 58 Appendix D, the NC-DAQ no longer needs the continuous monitor at the site for air quality forecasting and because of the lower fine particle concentrations throughout the state, the monitors are no longer needed to ensure an adequate fine particle network. The site is shown in Figure 14.



Figure 14. The Dillard School Fine Particle Monitoring Site

10. Changes to Monitoring in the Areas Outside Metropolitan Statistical Areas

In the fall of 2013 the NC-DAQ established a temporary monitoring site in Lee County on Blackstone Road to obtain background air quality data as part of a shale gas development study conducted by the NC Department of Environment and Natural Resources. At the **Blackstone** site, the NC-DAQ began operating a year-round ozone monitor on November 5, 2013 and air toxic monitors for volatile organic compounds, carbonyl compounds and hydrocarbons on November 6, 2013. A continuous fine particle air quality index monitor began operating on January 1, 2014. Meteorological equipment

was also installed in 2014. Sometime in 2014 a sulfur dioxide monitor and a nitrogen dioxide monitor will also be added to the site. The site is expected to operate at least one or two years.

At the **Candor** (37-123-0001) site in Montgomery County, the NC-DAQ operates a one-in-three day fine particle FRM monitor and a one-in-six day air toxic monitor for volatile organic compounds. In July of 2013 the NC-DAQ expanded air toxics monitoring at the site to include a one-in-six day carbonyl sampler. In August of 2013 the NC-DAQ add a continuous fine particle monitor to the site.

At the **Linkhaw** (37-155-0005) site in Robeson County, the NC-DAQ operates a one-in-three day fine particle FRM monitor. This entire site will shut down on December 31, 2014. The monitor is not required by 40 CFR 58 Appendix D and is measuring concentrations less than 80 percent of the National Ambient Air Quality Standards and because of the lower fine particle concentrations throughout the state, the monitor is no longer needed to ensure an adequate fine

particle network. The site is shown in Figure 15.



Figure 15. The Linkhaw Fine Particle Monitoring Site

At the **Bryson City** (37-173-0002) site in Swain County, the NC-DAQ operates a seasonal ozone monitor, a continuous fine particle monitor and a meteorological station. Starting sometime in August 2014 the NC-DAQ will add a sulfur dioxide monitor to the site to collect background data for modeling of sulfur dioxide emissions at the Asheville power plant. This monitor will operate for 12 months.

B. Sites to be Relocated or Moved

One monitoring site was relocated at the end of 2013 and another site will be relocated between the 2014 and 2015 ozone seasons. These sites are listed in Table 3.

Table 3. List of Sites to Be Relocated and New Locations Where Applicable

Fayetteville Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370511003	Golfview	Ozone & SO2	Site will move to a nearby school	4/1/2015
Not in a Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371210001	Spruce Pine City Hall	Fine Particles (PM _{2.5})	Evicted, site moved to hospital	12/31/2013
371210004	Spruce Pine Hospital	Fine Particles (PM _{2.5})	Replaced City Hall site	1/1/2014

1. Monitoring Site Relocations in the Fayetteville MSA

The Fayetteville MSA has three monitoring sites: two ozone-monitoring sites at Golfview (37-051-1003) and Wade (37-051-0008) and one particle monitoring site at the William Owen School (37-051-0009) in Fayetteville. Only the Golfview site needs to be relocated at this time. The **Golfview** site is shown in Figure 17. In February 2014, the NC-DAQ discovered the golf course where the monitoring station is located was closed and the property where the monitor is located is for sale. The property owner agreed to allow NC-DAQ to continue using the site until the site is sold. The property was sold in August. The new owner requested the NC-DAQ move the site as soon as possible. The NC-DAQ investigated surrounding properties to identify a potential location for the monitoring station. The property abuts



Figure 17. The Golfview Ozone Monitoring Site

YMCA property on one side and city property on the other. The NC-DAQ requested permission to move the site about 100 meters southeast to the adjacent YMCA property. The Y never responded to the request. Thus, the NC-DAQ is working with the school system to move the site to Honeycutt Elementary school, located about 9 kilometers northwest of the current site as shown in Figure 16. Figure 18 shows an aerial view of Honeycutt school. This season will be the last ozone season at the Golfview location.

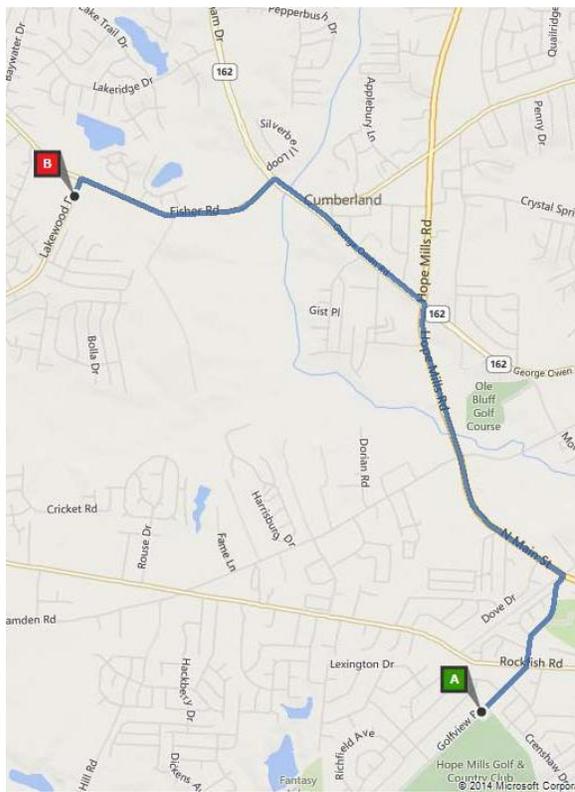


Figure 16. Location of proposed site in relation to the current monitoring site



Figure 18. Aerial view of the Honeycutt school property

2. Monitoring Site Relocations in non-MSAs

The NC-DAQ was evicted from the monitoring site located in Spruce Pine on the top of town hall (37-121-0001). The eviction notice from the Town of Spruce Pine is attached. The Town of Spruce Pine purchased a building and relocated their offices at the end of 2013. As a result, the NC-DAQ shut down the Spruce Pine site at the end of 2013 and established a new site at the Blue Ridge Regional Hospital (37-121-0004). Because of the timing of the notice, we were unable to include this modification to the network in the July 2013 Network Monitoring Plan. Thus, the NC-DAQ requested emergency approval from the U.S. Environmental Protection Agency Region IV for shutting down the old site and establishing the new site. Details on the new site are provided below.

Spruce Pine is in the mountains where there are very few flat open spaces where a monitor can be located. The NC-DAQ prefers to keep the monitors on the ground for safety reasons and for ease of access. After searching around Spruce Pine within a mile of the City Hall location, a new location was identified at Blue Ridge Regional Hospital, 125 Hospital Dr, Spruce Pine, NC. As shown in Figure 19, the hospital location is approximately 1 kilometer east southeast of the City Hall site. It is approximately 75 meters southeast of Highway U.S. 19 East, which had an average annual daily traffic count of 9,500 in 2012. According to Figure E-1 in 40 CFR 58 Appendix E, the monitor is on the edge of the neighborhood-urban scale boundary. The site is located approximately at latitude 35.912487 and longitude -82.062082. Pictures taken from the site location looking in 8 compass directions are provided in Figure 20 through Figure 21.

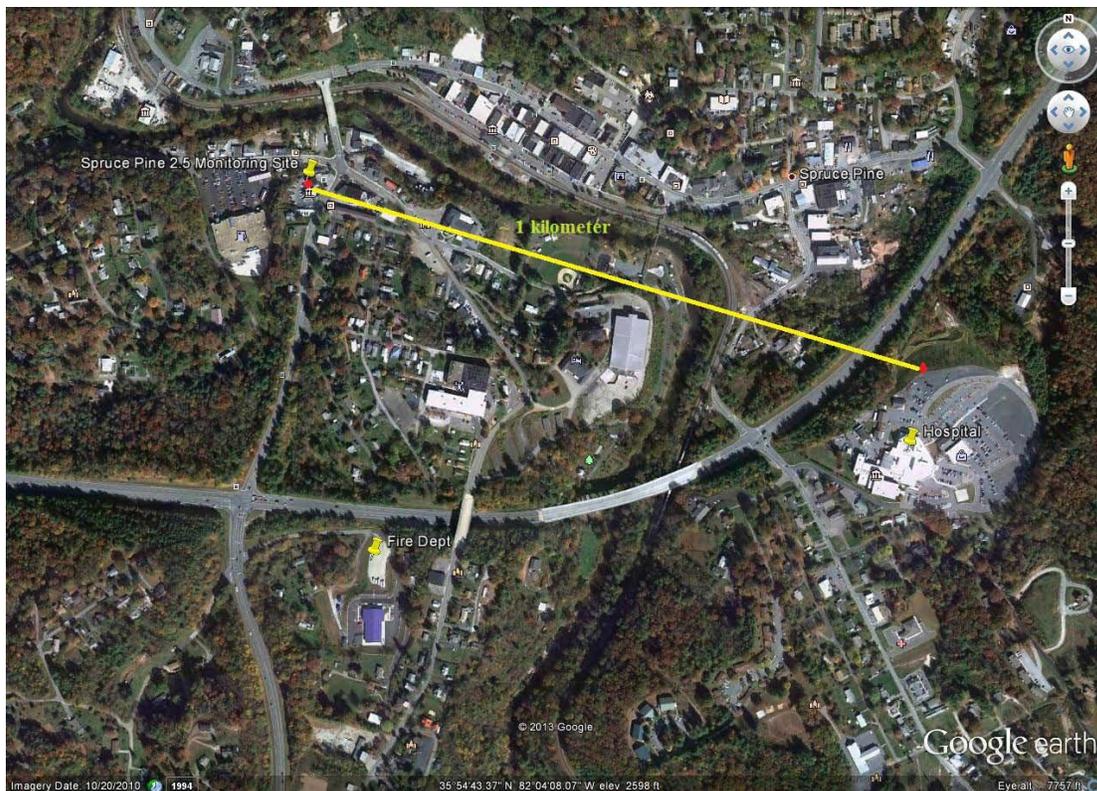


Figure 19. Aerial view of City Hall and Hospital monitoring sites



Figure 20. Spruce Pine Hospital Site Looking North



Figure 23. Spruce Pine Hospital Site Looking Northeast



Figure 21. Spruce Pine Hospital Site Looking Northwest



Figure 24. Spruce Pine Hospital Site Looking East



Figure 22. Spruce Pine Hospital Site Looking West



Figure 25. Spruce Pine Hospital Site Looking Southeast



Figure 26. Spruce Pine Hospital Site Looking Southwest



Figure 27. Spruce Pine Hospital Site Looking South

The hospital has a boiler house and emergency generators but the monitor is at least 200 meters northeast from them. The trees to the northeast are about 32 meters high and 80 meters from the site. The trees to the east are about 33 meters high and 86 meters away. The trees to the southeast are 60 meters tall and 140 meters away. The building to the southwest is about 11 meters high and 130 meters from the site. The trees to the west are about 38 meters tall and 90 meters away. All of the trees and buildings are far enough away as to not be obstacles to the flow of the air. Sometime in the future the hospital may expand the parking lot out to the area where NC-DAQ proposes to place the monitor. The NC-DAQ anticipates that should that happen, the monitor will still be at least 3 meters from the nearest parking space.

C. Changes to the Methods Used to Measure Fine Particles for Comparison to the NAAQS

Currently the NC-DAQ uses an R & P Model 2025 PM_{2.5} Sequential Monitor with a WINS impactor (Air Quality System (AQS) Method Code 118) and U.S. EPA reference method designation RFPS-0498-118 for determining compliance with the fine particle NAAQS for all but three of its sites. The NC-DAQ uses a Ruprecht & Patshneck TEOM Series 1400a for continuous (averaged on an hourly basis) measurement of fine particles for many of its sites. The TEOM is ineligible to become an equivalent method for fine particles because it does not work as well in other parts of the nation as it does in North Carolina. Reference and equivalent methods need to work the same throughout the nation. Also, the TEOM is no longer supported by the manufacturer so eventually parts will not be available for it.

In early 2008, the Met One Beta Attenuation Monitor (BAM) was approved as a Federal Equivalent Method (FEM). Since 2008 the NC-DAQ purchased 12 BAMs. After one-to-two-year studies, three R & P Model 2025 PM_{2.5} Sequential Monitors have been replaced by BAMs. These BAM monitors are located at the Raleigh Millbrook (37-183-0014), Cherry Grove (37-033-0001) and Bryson City (37-173-0002) monitoring sites. Four other BAMs installed for a two-year study in 2012 in the eastern half of the state as special purpose non-regulatory monitors did not meet the equivalency requirements as shown in Figure 70 through Figure 73. Table 4 lists the current sites and proposed sites with BAMs that are operating but not being compared to the NAAQS. In 2013 a special purpose non-regulatory BAM was added to the Candor site for a two year

comparison study. In 2014 the NC-DAQ established a new site at Blackstone in Lee County and plans to add BAMs at the Boone, Lexington, Rockwell and Hickory sites.

Table 4. List of Monitoring Sites with Special Purpose Non-Regulatory and Air Quality Index Continuous Fine Particle Monitors

Charlotte-Concord-Gastonia Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371590021	Rockwell	Fine Particles (PM _{2.5})	Will swap out TEOM for a BAM in 2014	7/31/2014
Winston-Salem Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370570002	Lexington	Fine Particles (PM _{2.5})	Will swap out TEOM for a BAM in 2014	7/31/2014
Durham-Chapel Hill Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370630015	Durham Armory	Fine Particles (PM _{2.5})	Will swap out TEOM for a BAM in 2014	12/31/2014
Hickory Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370350004	Hickory	Fine Particles (PM _{2.5})	Will swap out TEOM for a BAM the end of 2014	1/1/2015
Wilmington Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371290002	Castle Hayne	Fine Particles (PM _{2.5})	BAM will be converted to an AQI monitor only	10/23/2014
Goldsboro Metropolitan Statistical Area				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371910005	Dillard	Fine Particles (PM _{2.5})	BAM will be converted to an AQI monitor only Monitor will shut down	9/30/2014 12/31/2014
Not In A Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites				
AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370330001 ^c	Cherry Grove	Fine Particles (PM _{2.5})	BAM became the primary NAAQS monitor	3/1/2014
370610002	Kenansville	Fine Particles (PM _{2.5})	BAM will be converted to an AQI monitor only	1/1/2014
371050002	Blackstone	Fine Particles (PM _{2.5})	BAM started in 2014	1/1/2014
371170001	Jamesville	Fine Particles (PM _{2.5})	BAM will be converted to an AQI monitor only	9/30/2014
371290001	Candor	Fine Particles (PM _{2.5})	Added a continuous monitor in 2013	8/1/2013
371890003	Boone	Fine Particles (PM _{2.5})	Will add a continuous monitor in summer 2014	7/31/2014

D. Rotating Background Monitors

Currently the NC-DAQ operates two rotating background monitoring networks for providing background concentration data for prevention of significant deterioration (PSD) modeling. PSD modeling is a federal requirement necessitating the collection of 12 consecutive months of background data. Monitors for sulfur dioxide (SO₂) or PM₁₀ rotate to these sites every three years. The rotating sites were selected to provide the greatest possible spatial coverage from the coastal plain to the foothills. The sites with background monitors and the schedules for operating the background monitors are provided in Table 5.

Table 5. List of Rotating Background Monitors**Charlotte-Concord-Gastonia Metropolitan Statistical Area**

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370710016	Grier Middle School/ Gastonia	PM ₁₀	Rotating background PM ₁₀ monitoring will be moved to Taylorsville-Liledoun when this site shuts down	3/25/2014

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371570099	Bethany	SO ₂	Rotating SO ₂ monitor resumed operating in 2014	2/2014 to 1/2015

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370370004	Pittsboro	SO ₂	Rotating SO ₂ monitor resumed operating in 2014	2/2014 to 1/2015

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370511003	Golfview	SO ₂	Rotating SO ₂ monitor will resume operating in 2015	3/2015 to 2/2016

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370030005	Taylorsville-Liledoun	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling will be relocated to this site	4/2016 to 3/2017
370270003	Lenoir	SO ₂	Rotating SO ₂ monitor will resume operating in 2016	4/2016 to 3/2017

Not In A Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370330001 ^c	Cherry Grove	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling will resume	4/2016 to 3/2017
370610002	Kenansville	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling will resume	8/2013 to 8/2014
371110004	East Marion	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling resumed	3/1/2014 to 2/28/2015
371170001	Jamesville	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling will resume	3/2015 to 2/2016
		SO ₂	Rotating SO ₂ monitor will resume operating in 2016	4/2016 to 3/2017
371290001	Candor	PM ₁₀	Rotating background PM ₁₀ monitoring to support PSD modeling resumed	4/22/2014 to 4/30/2015

E. Currently Required Future Near-Road Monitors

The current monitoring regulations will require the NC-DAQ to add additional near road monitors in 2017. Table 6 lists future near road sites as well as monitors that will need to be added to the two near road sites that are scheduled to start January 1, 2014. At this time the US EPA does not have funding to add additional near road nitrogen dioxide monitoring sites in areas with population s between 500,000 and one million. If funding is provided for additional near road sites, those sites will be discussed in greater detail in the 2015 and 2016 network plans. At this time the NC-DAQ plans to

seek a waiver for the Durham near road monitor and may also ask for waivers for the monitors in Greensboro and Winston-Salem.

Table 6. List of Near Road Monitoring Scheduled to Start January 1, 2017

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
37119044 ^a	Remount Road	CO	A near-road CO monitor will begin operating to meet Appendix D requirements	1/01/2017
		Fine Particles (PM _{2.5})	A near-road PM _{2.5} monitor will begin operating to meet Appendix D requirements	1/01/2017

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
371830021	Triple Oak Road	CO	A near-road CO monitor will begin operating to meet Appendix D requirements	1/01/2017
		Fine Particles (PM _{2.5})	A near-road PM _{2.5} monitor will begin operating to meet Appendix D requirements	1/01/2017

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370830015	Knox Road	NO ₂	A near-road NO ₂ monitor is currently required to meet Appendix D requirements	1/01/2017

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
370670031 ^b	To be determined	NO ₂	A near-road NO ₂ monitor is currently required to meet Appendix D requirements	1/01/2017

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor or Pollutant	Proposed Change	Time Frame
37063016	Page Road	NO ₂	A near-road NO ₂ monitor is currently required to meet Appendix D requirements	1/01/2017

^a Operated by Mecklenburg County Air Quality

^b Operated by Forsyth County Office of Environmental Assistance and Protection

III. Carbon Monoxide (CO) Monitoring Network

Carbon Monoxide monitoring is conducted in three of the major urban areas of the State. The 2014-2015 state-operated network consists of a monitor in the Raleigh-Durham-Cary-Chapel Hill Combined Statistical Area that collects data using a Federal Reference Method for comparison to the National Ambient Air Quality Standards (NAAQS). Local program agencies operate carbon monoxide monitors in Charlotte and Winston-Salem. These state and local agency sites are in three of the five largest urban areas in North Carolina. The Peters Creek Winston-Salem location is a micro-scale site that provides maximum carbon monoxide concentrations for the monitoring area. The Raleigh and Charlotte sites are middle and neighborhood scale sites that are part of the National Core (NCore) network. None of these sites reported exceedances of the one or eight hour ambient air quality standard from 2009 to 2013. In 2012, the state shut down the high sensitivity carbon monoxide non-reference method monitor at Rockwell in Rowan County.

The Crabtree micro-scale maximum concentration CO site in Raleigh (Wake County) operated to meet requirements in the NC DAQ CO maintenance State Implementation Plan (SIP). The SIP requires the state to operate at least one CO monitor in either Durham or Wake Counties so that the data from the monitor can be used to trigger contingency requirements. In 2009 the NC DAQ started operating the trace-level CO monitor at the Millbrook NCore site in Raleigh. This trace level monitor is classified by EPA as a Federal Reference Method and is therefore suitable to be compared to the NAAQS. The 2nd-highest 8-hour average for both monitors in 2010 was 2 parts per million, which is less than 25 percent of the NAAQS. Because the monitors had the same design value in 2010 and the design value was so far below the standard, the NC DAQ shut down the Crabtree site on March 31, 2011 and is now using the Millbrook CO monitor to meet the requirements in the SIP.

In 2012 the NC-DAQ evaluated the ozone and fine particle precursor monitoring at Rockwell and decided that the carbon monoxide monitor provided information that was less needed than information from other monitors that have been planned for the site but not installed because of limited resources. As a result, the NC-DAQ shut down the non-regulatory carbon monoxide monitor at the site in July 2012 when it broke.

Table 7 provides the highest maximum 1-hour and 8-hour concentrations for each operating site for 2009 through 2013. Table 8 provides the locations of the sites for the North Carolina Carbon Monoxide Monitoring Network. Table 9 provides the statement of purpose for each current and proposed monitoring site in the North Carolina Carbon Monoxide Monitoring Network. Table 10 summarizes the status for each current and proposed monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in Appendices A, C, D and E of 40CFR58. Table 10 also provides a summary of proposed and planned changes to the carbon monoxide monitoring network.

Table 7 Carbon Monoxide Concentrations Measured by the North Carolina Carbon Monoxide Monitoring Network 2009 to 2013 ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr 1 st max for 2009-2013			Highest 8-hr 1 st max for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371190041 ^{c, d}	Garinger	4.2	12 %	2012	2.0	22 %	2010
371190041 ^{c, e}	Garinger	2.7	-	2012	1.7	-	2010
371590021 ^{e, f, g, h}	Rockwell	1.5	-	2009	0.8	-	2011

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr 1 st max for 2009-2013			Highest 8-hr 1 st max for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371830014 ^{e, f}	Millbrook	2.7	7.7 %	2009	1.7	19 %	2010
371830018 ^{d, g}	Crabtree	2.3	6.6 %	2009	1.8	20 %	2010

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr 1 st max for 2009-2013			Highest 8-hr 1 st max for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370670023 ^{d, i}	Peters Creek	3.9	11 %	2009	2.3	26 %	2011

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr 1 st max for 2009-2013			Highest 8-hr 1 st max for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370630015 ^{e, g}	Durham Armory	0.8	-	2009	0.7	-	2009

^a All monitors use an Instrumental Nondispersive Infrared Thermo Electron 48C Method (Air Quality System (AQS) Method Code 054) except one of the monitors operated by the Mecklenburg County Air Quality which uses an Instrumental Gas Filter Correlation Teledyne API 300 EU (AQS Method Code 593)

^b The National Ambient Air Quality Standard (NAAQS) for a 1-hour period is 35 parts per million and 9 for an 8-hour period. Attainment is based on the second highest average for the calendar year.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d Monitor method suitable for comparing to the NAAQS

^e Monitor method unsuitable for comparing to the NAAQS

^f Year-round trace-level CO

^g This monitor was shut down

^h The Rockwell monitor was located in Rowan County as a downwind site for the Charlotte MSA and an upwind site for the Greensboro-High Point MSA.

ⁱ Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

Table 8 North Carolina Carbon Monoxide Monitoring Network – Monitor Locations^a
Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Site Location				MSA, CSA, or CBSA represented
		Street Address	City	Longitude	Latitude	
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	-80.7857	35.2401	Charlotte
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	-80.7857	35.2401	Charlotte

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Site Location				MSA, CSA, or CBSA represented
		Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	-78.5742	35.8561	Raleigh

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Site Location				MSA, CSA, or CBSA represented
		Street Address	City	Longitude	Latitude	
370670023 ^c	Peters Creek	1401 Corporation Parkway	Winston-Salem	-80.2583	36.0658	Winston-Salem

^a All monitors use an Instrumental Nondispersive Infrared Thermo Electron 48C or 48 i Method (Air Quality System (AQS) Method Code 054 or 554) except the NCore monitor operated by Mecklenburg County Air Quality which uses an Instrumental Gas Filter Correlation Teledyne API 300 EU (AQS Method Code 593)

^b Operated by Mecklenburg County Air Quality (Air Quality System (AQS) Reporting Agency 0669)

^c Operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

Table 9 North Carolina Carbon Monoxide Monitoring Network - Statement of Purpose^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371190041 ^b	Garinger	SLAMS	Hourly Year round	Compliance with the NAAQS, Required in SIP.	Population Exposure	Neighborhood
371190041 ^b	Garinger	SLAMS	Hourly Year round	Ozone and fine particle precursor monitoring	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	SLAMS	Hourly Year round	Ozone and fine particle precursor monitoring. Compliance with the NAAQS, Required in SIP.	Population Exposure; General/ Background	Middle

Winston-Salem Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370670023 ^c	Peters Creek	SLAMS	Hourly Year round	Compliance with the NAAQS, Required in SIP.	Highest Concentration	Micro

^a All monitors use an Instrumental Nondispersive Infrared Thermo Electron 48C or 48i Method (Air Quality System (AQS) Method Code 054 or 554) except one of the monitors operated by the Mecklenburg County Air Quality which uses an Instrumental Gas Filter Correlation Teledyne API 300 EU (AQS Method Code 593)

^b Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

Table 10 Status of North Carolina Carbon Monoxide Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D & E ^b		Proposal to Move or Change
			C ^c	D	
371190041 ^d	Garinger	Yes	Yes: RFCA-0981-054	No Criteria	Shut down when trace analyzer is set up to run dual levels.
371190041 ^d	Garinger	Yes	Yes: RFCA-1093-093	Yes - NCore	None

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D & E ^b		Proposal to Move or Change
			C ^c	D	
371830014	Millbrook	Yes	Yes: RFCA-0981-054	Yes - NCore	None

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D & E ^b		Proposal to Move or Change
			C ^c	D	
370670023 ^e	Peters Creek	Yes	Yes: RFCA-0981-054	No Criteria	None

^a All monitors use an Instrumental Nondispersive Infrared Thermo Electron 48C or 48i Method (Air Quality System (AQS) Method Code 054 or 554) except one of the monitors operated by Mecklenburg County Air Quality which uses an Instrumental Gas Filter Correlation Teledyne API 300 EU (AQS Method Code 593)

^b All monitors meet the requirements of 40CFR58 Appendix A. The only monitors required in Appendix D are for NCore. All sites meet the appropriate siting criteria in Appendix E of 40CFR58.

^c RFCA-0981-054 is the code assigned by the U.S. EPA to reference and equivalent methods that are suitable for comparison to the National Ambient Air Quality Standards. The list of reference and equivalent methods is available at <http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf>.

^d Operated by the Mecklenburg County Air Quality (Air Quality System (AQS) Reporting Agency 0669)

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

IV. Sulfur Dioxide Monitoring Network

Sulfur Dioxide (SO₂) monitoring is currently conducted in North Carolina at 12 sites operated by the North Carolina Division of Air Quality (NC-DAQ) and at two sites operated by local programs. In addition, the South Carolina Department of Health and Environmental Control operates a background Special Purpose SO₂ monitor in York County, South Carolina [part of the Charlotte- Concord-Gastonia Metropolitan Statistical Area (MSA)]

The data collected is used to determine human health effect exposures in MSAs with more than one million people, to collect background levels for Prevention of Significant Deterioration (PSD) permit modeling and to determine the impact on SO₂ levels due to facilities that burn large quantities of fossil fuels or manufacture sulfuric acid. Though few major cities are being monitored for sulfur dioxide, data from previous years show these cities to have sulfur dioxide concentrations less than 40 percent of the limits established by the U.S. Environmental Protection Agency (EPA) for all areas except Wilmington (the SO₂ monitor in New Hanover County is currently at 64 percent of the one-hour SO₂ standard, but the SO₂ levels have fallen rapidly the past two years due to emissions reductions at nearby sources).

Table 11 lists the highest concentrations of sulfur dioxide measured in North Carolina between 2009 and 2013 as compared to the National Ambient Air Quality Standards (NAAQS). Table 12 provides the locations of the current and proposed sites through 2016 for the North Carolina Sulfur Dioxide Monitoring Network. Table 13 provides the statement of purpose for each current and proposed monitoring site in the North Carolina Sulfur Dioxide Monitoring Network. Table 14 summarizes the status of each current and proposed monitoring site regarding the suitability for comparison to the NAAQS and whether or not it meets the requirements as outlined in Appendices A, C, D and E of 40CFR58. Table 14 also provides a summary of proposed and planned changes to the sulfur dioxide monitoring network.

The NC-DAQ operates one trace-level SO₂ monitor on a 100 ppb scale because low levels of SO₂ are a precursor for fine particle formation. The current network consists of one site in Wake County. The Wake County site is a National Core (NCore) monitoring site. The NC DAQ monitors for these trace-level-particle precursor pollutants year-round because monitoring for fine particles is required on a year-round basis. Mecklenburg County Air Quality also operates a trace-level SO₂ monitor at the Garinger NCore site in Mecklenburg County.

The federal government requires industries that want to expand or begin operations in an area to conduct 12 consecutive months of background monitoring to use in modeling to demonstrate the addition or expansion of their facility will not contribute to the significant deterioration of air quality in that area. In 2010, the NC-DAQ modified the rotating PSD network by shutting down the Bryson City SO₂ monitor (Swain County) and adding rotating PSD SO₂ monitors at Lenoir (Caldwell County) and Bethany (Rockingham County). Assessment of the SO₂ monitoring network indicated that the ability of NC-DAQ to meet its obligation to provide relevant background SO₂ data for PSD modeling could be improved by these changes.

In 2011 the NC-DAQ moved the Aurora monitor across the Pamlico River to the Bayview Ferry station because more people live over there and the new site is downwind of the PCS facility. Figure 28 shows the relative locations of the two sites. The Bayview Ferry site began operating January 2011

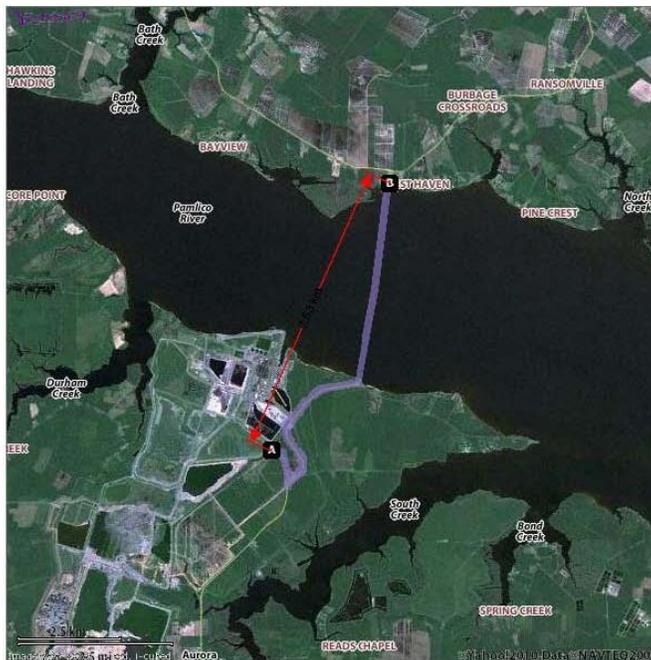


Figure 28. Location of the Bayview Ferry Site (B) Relative to the Aurora Site (A)

In 2010 the EPA changed the monitoring regulations for sulfur dioxide to support the lower sulfur dioxide NAAQS. For the SO₂ monitoring network the EPA developed the population weighted emissions index (PWEI). The PWEI is calculated for each Core-Based Statistical Area (CBSA) by multiplying the population of each CBSA, using the most current census data or estimates, by the total amount of SO₂ in tons per year emitted within the CBSA, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product is divided by 1,000,000, providing a PWEI value, the units of which are million person-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO₂ monitor is required within that CBSA. In 2013, the 2010 sulfur dioxide monitoring requirements required North Carolina to add three PWEI sulfur dioxide monitors to three MSAs in North Carolina: Charlotte-Concord-Gastonia, Durham-Chapel Hill and Wilmington.

The SO₂ monitoring site(s) required as a result of the calculated PWEI in each CBSA satisfies minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types (as defined in section 1.1.1 of 40 CFR 58 Appendix D): population exposure, highest concentration, source impacts, general background, or regional transport. SO₂ monitors at NCore

stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA that is required to have one or more PWEI monitors.

The 2010 regulations required the NC-DAQ to include a monitoring plan for the sulfur dioxide PWEI network with the Network Monitoring Plan due on July 1, 2011 and allowed that monitoring plan to be revised in 2012. After the 2012 monitoring plan was submitted, the US EPA recalculated the PWEI numbers. This plan reflects the revised numbers calculated by the US EPA in July 2012. Figure 29 shows the locations of the three required PWEI sulfur dioxide monitoring sites.

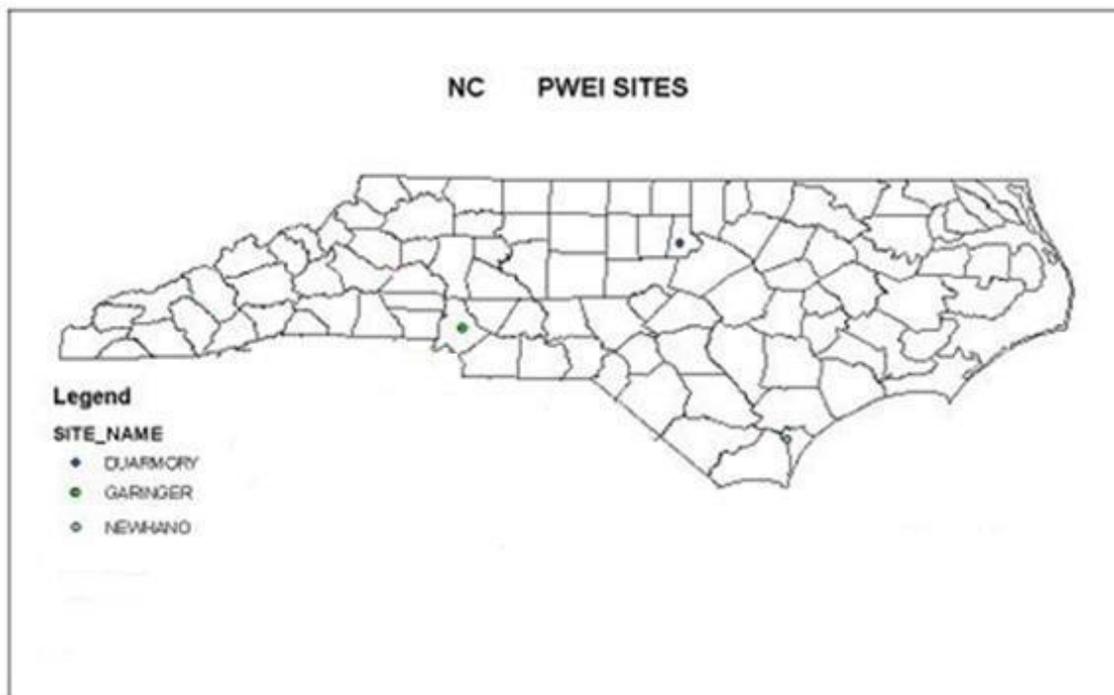


Figure 29. Location of North Carolina PWEI monitors

In 2011 the NC-DAQ and the MCAQ proposed the following monitoring sites to meet the PWEI requirements:

- Garinger as a population exposure monitor in the Charlotte-Concord-Gastonia MSA;
- Durham Armory as a population exposure monitor in the Durham MSA; and
- New Hanover as a population exposure/highest concentration monitor in the Wilmington MSA.

These locations were approved by EPA Region 4 in 2011 (see Appendix E. 2011 Network Plan EPA Approval Letter).

In the 2011 network plan the NC-DAQ proposed doing PWEI monitoring at five additional sites, located in the Asheville, Charlotte-Concord-Gastonia, Greensboro-High Point, Hickory and Winston-Salem MSAs. After the network plan was written the EPA developed revised PWEI lists, which no longer included required PWEI monitors for those three areas. As a result, the NC-DAQ did not add PWEI monitors to the Waynesville Elementary School, Mendenhall School and Hickory sites and the revised

2013 network plan, reflecting a smaller PWEI network, was approved by the EPA (see Appendix G. 2013 Network Plan EPA Approval Letter).

In 2014 the EPA came out with guidance for modeling and monitoring around specific facilities emitting over certain quantities of sulfur dioxide. The modeling and/or monitoring is required to demonstrate compliance with the NAAQS. The modeling guidance requires background levels of sulfur dioxide to be taken into account. The NC-DAQ anticipates that the Roxboro coal-fired electric generating facility in Person County will be one of the facilities in North Carolina for which the NC-DAQ will need to do modeling. Background sulfur dioxide data has not been collected in Person County within the last three years. As a result the NC-DAQ started collecting background sulfur dioxide data at the Bushy Fork site on May 21, 2014. The monitor will operate through the end of May 2015 to meet the federally-required modeling protocols. For similar reasons the NC-DAQ began sulfur dioxide monitor at Bryson City in Swain County in August 2014. The NC-DAQ anticipates that the Asheville coal-fired electric generating facility in Buncombe County may also be a facility for which the NC-DAQ will need to do modeling.

Table 11 Highest Sulfur Dioxide Concentration and Year Measured by the North Carolina Sulfur Dioxide Monitoring Network (2009 through 2013) ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371190041 ^c	Garinger	61	81%	2007-2009	0.0348	6.96%	2009

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371830014	Millbrook	13	17 %	2010-2012	0.035	7 %	2009

Greensboro-High-Point Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371570099 ^d	Bethany	17.5	-	2011	0.013	2.6 %	2011

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370670022 ^e	Hattie Avenue	37	49 %	2007-2009	0.031	6.2 %	2010

Table 11 Highest Sulfur Dioxide Concentration and Year Measured by the North Carolina Sulfur Dioxide Monitoring Network (2009 through 2013) ^a

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370370004 ^d	Pittsboro	12	-	2011	0.019	3.8 %	2011

Fayetteville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370511003 ^d	Golfview	10.0	-	2009	0.0086	2 %	2009

Wilmington Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
371290006	New Hanover	110	147 %	2008-2010	0.113	22.6 %	2010

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Identification Number	Site Name	Highest 1-hr Design Value Observed for 2009 to 2013			Highest 3-hr average observed (1 st max) for 2009 to 2013		
		Value (parts per billion)	Percent of NAAQS ^b	Year	Value (parts per million)	Percent of NAAQS ^b	Year
370130007 ^f	New Aurora	33	44 %	2007-2009	0.0323	6.46 %	2010
370130151 ^d	Bayview	24	32 %	2011-2013	0.020	4 %	2011
371170001 ^d	Jamesville	6	-	2010	0.008	2 %	2010
371730002 ^{d, g}	Bryson City	5	-	2010	0.005	1 %	2010

^a Monitors at all sites use an Automated Equivalent Method. The NC-DAQ monitors at all sites except for Millbrook in Raleigh use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C (Air Quality System (AQS) Method Code 009). The monitor at Millbrook in Raleigh and the monitor operated by Mecklenburg County Air Quality use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C-TLE (AQS Method Code 560). The monitor operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403) uses an Instrumental Ultraviolet Fluorescence method using an API Model 100 A SO₂ Analyzer (AQS Method Code 100).

^b The National Ambient Air Quality Standard for the 99th percentile maximum one hour concentration during a 24-hour period is 75 parts per billion averaged over 3 years and 0.5 parts per million for a 3-hour period. Attainment of the secondary standard is based on the second highest average for the calendar year.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d Three years of data are not available to calculate a design value.

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^f The New Aurora monitor was located in Beaufort County on the fence line of the PCS Phosphate facility. It began operation in September 2005 and stopped in January 2011.

^g The Bryson City monitor was located in Swain County and was operated every three years to provide background data for permit modeling to meet requirements for prevention of significant deterioration. The monitor was shut down in April 2010 because the site was moved, the monitor broke during the site move, the NC-DAQ learned that the data was not required for PSD modeling because of the terrain, the measured values were low and no users of the data could be identified.

Table 12 North Carolina Sulfur Dioxide Monitoring Network – 2014 and Proposed Monitor Locations ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	-80.785683	35.24028	Charlotte
450910006 ^c	York	2316 Chester Highway (US 321)	York, SC	-81.228409	34.935817	Charlotte
Raleigh Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	-78.574167	35.856111	Raleigh
Greensboro-High Point Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371570099 ^d	Bethany	6371 NC 65	Bethany	-79.859167	36.308889	Greensboro
Winston-Salem Metropolitan Statistical Area						
AQS Site Identification Number	Site Location Site Name	MSA, CSA, or CBSA represented				MSA, CSA, or CBSA represented
		Street Address	City	Longitude	Latitude	
370670022 ^d	Hattie Avenue	Corner of 13 th & Hattie Avenue	Winston-Salem	-80.226667	36.110556	Winston-Salem
Durham-Chapel Hill Metropolitan Statistical Area						
AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370370004	Pittsboro	Route 4, Box 62 Russett Run Road	Pittsboro	-79.159722	35.757222	Durham-Chapel Hill
370630015	Durham Armory	801 Stadium Drive	Durham	-78.905417	36.032944	Durham-Chapel Hill
371450003	Bushy Fork	Highway 49 South	Bushy Fork	-79.091970	36.306965	Durham-Chapel Hill
Fayetteville Metropolitan Statistical Area						
AQS Site Identification Number	Site Location Site Name	MSA, CSA, or CBSA represented				MSA, CSA, or CBSA represented
		Street Address	City	Longitude	Latitude	
370511003	Golfview	3625 Golfview Road	Hope Mills	-78.9625	34.968889	Fayetteville
Hickory Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370270003 ^f	Lenoir	110 Nuway Circle NE	Lenoir	-81.530278	35.935833	Hickory
Wilmington Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371290006	New Hanover	2400 US Highway 421 N	Wilmington	-77.956529	34.268403	Wilmington

Table 11 Highest Sulfur Dioxide Concentration and Year Measured by the North Carolina Sulfur Dioxide Monitoring Network (2009 through 2013) ^a

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370130151 ^g	Bayview	229 NC Highway 306N	Bath	-76.74	35.428	None
371170001	Jamesville	1210 Hayes Street	Jamesville	-76.89782	35.81069	None
371730002	Bryson City	Parks & Rec Bldg, Center Street	Bryson City	-83.443697	35.435509	None

^a Monitors at all sites use an Automated Equivalent Method. The NC-DAQ monitors, except the monitor at the Millbrook NCore site, use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C (Air Quality System (AQS) Method Code 009). The monitor at the Millbrook NCore site and the monitor operated by Mecklenburg County Air Quality use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C-TLE (AQS Method Code 560). The monitor operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403) uses an Instrumental Ultraviolet Fluorescence method using an API Model 100 A SO₂ Analyzer (AQS Method Code 100).

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by the South Carolina Department of Health and Environmental Control (AQS Reporting Agency 0971).

^d This monitor started operating on 1/1/2011 on a 1-in-3 year schedule.

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^f This monitor started operating on 1/1/2013 on a 1-in-3 year schedule. It replaces the Bryson monitor.

^g This monitor is located in Beaufort County on the fence line of the PCS Phosphate facility. It replaced the New Aurora Site (37013007) that was dislocated by nearby current land clearing and future mining activities.

^h This monitor has been proposed for several years to support fine particle precursor monitoring at this site.

Table 13 Statement of Purpose for North Carolina Sulfur Dioxide Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371190041 ^c	Garinger	NCORE	Every year	Compliance with the NAAQS; required monitor for NCore & PWEI.	Population Exposure	Neighborhood
371590021 ⁱ	Rockwell	Proposed SLAMS	Every year; Will begin trace-level monitoring in 2013	SO ₂ fine particle precursor monitoring. Compliance with the NAAQS.	General/Background	Urban
450910006 ^d	York	Special Purpose	Every year	Second required PWEI monitor for the MSA	Extreme Downwind	Urban

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	NCORE	Every year;	Required monitor for NCore. SO ₂ fine particle precursor monitoring. Compliance w/NAAQS.	General/Background	Neighborhood

Greensboro-High Point Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
37-157-0099 ^e	Bethany	Special	Every 3rd year.	Industrial expansion monitoring	General/	Urban

Table 13 Statement of Purpose for North Carolina Sulfur Dioxide Monitoring Network ^a

		Purpose		for PSD modeling.	Background	
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Winston-Salem Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370670022 ^f	Hattie Avenue	SLAMS	Every year	Compliance with the NAAQS; PWEI Monitor	Population Exposure	Neighborhood

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370370004	Pittsboro	Special Purpose	Every 3rd year. Site operated in '11 & will operate again in 2014	Industrial expansion monitoring for PSD modeling.	Upwind/Background General/Background	Urban
370630015	Durham Armory	SLAMS	Every year;	PWEI Monitor for Durham-Chapel Hill MSA	Population Exposure	Neighborhood
371450003	Bushy Fork	Special Purpose	5/21/2014 to 5/31/2015	Provide background data for SO2 permit modeling	General/Background	Urban

Fayetteville Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370511003	Golfview	SLAMS	Every 3rd year. Site operated in '12 & will operate again in '15	Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood

Hickory Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370270003 ^g	Lenoir	Special Purpose	Every 3rd year. Site is operating in 2013	Industrial expansion monitoring for PSD modeling.	General/Background	Regional

Wilmington Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371290006	New Hanover	SLAMS	Every year	Maximum concentration site to ensure compliance w/NAAQS; required PWEI monitor	Population Exposure/ Highest Concentration	Urban

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370130151 ^h	Bayview	SLAMS	Every year	Fence-line monitoring at PCS Phosphate facility to ensure compliance with the NAAQS	Source Oriented	Neighborhood
371170001	Jamesville	Special Purpose	Every 3rd year. Site is operating in '13.	Industrial expansion monitoring for PSD modeling.	Upwind/Background General/Background	Urban
371730002	Bryson City	Special Purpose	8/21/2014 to 8/31/2015	Provide background data for SO2 permit modeling	General/Background	Urban

^a Monitors at all sites use an Automated Equivalent Method. The NC-DAQ monitors, except the monitor at the Millbrook NC Core site, use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C (Air Quality

Table 13 Statement of Purpose for North Carolina Sulfur Dioxide Monitoring Network ^a

System (AQS) Method Code 009). The monitor at the Millbrook NCore site and the monitor operated by Mecklenburg County Air Quality use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C-TLE (AQS Method Code 560). The monitor operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403) uses an Instrumental Ultraviolet Fluorescence method using an API Model 100 A SO₂ Analyzer (AQS Method Code 100).

^b All monitors operate year round on an hourly schedule.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d Operated by the South Carolina Department of Health and Environmental Control (AQS Reporting Agency 0971).

^e This monitor started operating on 1/1/2011 on a 1-in-3 year schedule.

^f Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^g This monitor started operating on 1/1/2013 on a 1-in-3 year schedule. It replaced the Bryson monitor.

^h This monitor is located in Beaufort County on the fence line of the PCS Phosphate facility. It replaced the New Aurora site (37013007) that was dislocated by nearby land clearing and future mining activities.

ⁱ This monitor has been proposed for several years to support fine particle precursor monitoring at this site.

Table 14 Status of North Carolina Sulfur Dioxide Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
371190041 ^d	Garinger	Yes	Yes: EQSA-0486-060	None
450910006 ^e	York	Yes	Yes: EQSA-0486-060	None

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
371830014	Millbrook	Yes	Yes: EQSA-0486-060	None

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
371570099 ^f	Bethany	Yes	Yes: EQSA-0486-060	Site will operate 2/1/2014 to 1/31/2015

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
370670022 ^g	Hattie Avenue	Yes	Yes: EQSA-0495-100	None

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
370370004	Pittsboro	Yes	Yes: EQSA-0486-060	Site will operate 2/1/2014 to 1/31/2015
370630015	Durham Armory	Yes	Yes: EQSA-0486-060	None
371450003	Bushy Fork	Yes	Yes: EQSA-0486-060	Site started 5/21/2014 and will end 5/31/2015

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
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Table 14 Status of North Carolina Sulfur Dioxide Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

370511003	Golfview	Yes	Yes: EQSA-0486-060	Site operated in 2012 and will operate again in 2015; site will move to YMCA
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Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
370270003 ^h	Lenoir	Yes	Yes: EQSA-0486-060	Site operated in 2013 and will operate again in 2016

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
371290006	New Hanover	Yes	Yes: EQSA-0486-060	None

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices A, C, D, & E ^{b, c}	Proposal to Move or Change
370130151 ⁱ	Bayview Ferry	Yes	Yes: EQSA-0486-060	None
371170001	Jamesville	Yes	Yes: EQSA-0486-060	Site operated in 2013 and will operate again in 2016
371730002	Bryson City	Yes	Yes: EQSA-0486-060	Site started 8/21/2014 and will end 8/31/2015

^a Monitors at all sites use an Automated Equivalent Method. The NC-DAQ monitors use an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C (Air Quality System (AQS) Method Code 009). The monitor operated by Mecklenburg County Air Quality uses an Instrumental Pulsed Fluorescence method using a Thermo Electron 43C-TLE (AQS Method Code 560). The monitor operated by Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403) uses an Instrumental Ultraviolet Fluorescence method using an API Model 100 A SO₂ Analyzer (AQS Method Code 100).

^b All monitors meet the requirements of 40CFR58 Appendix A. The Quality Assurance Project Plan and Standard Operating Procedures are being revised to reflect the changes to Appendix A of Part 58 promulgated in 2006. Appendix D has no minimum requirements for Sulfur Dioxide Monitoring. All sites meet the appropriate siting criteria in Appendix E of 40CFR58 promulgated in 2006.

^c EQSA-0486-060 and EQSA-0495-100 are codes assigned by the U.S. EPA to reference and equivalent methods that are suitable for comparison to the National Ambient Air Quality Standards. The list of reference and equivalent methods is available <http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf>.

^d Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^e Operated by the South Carolina Department of Health and Environmental Control (AQS Reporting Agency 0971).

^f This monitor started operating on 1/1/2011 on a 1-in-3 year schedule.

^g Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^h This monitor will start operating on 1/1/2013 on a 1-in-3 year schedule. It will replace the Bryson monitor.

ⁱ This monitor is located in Beaufort County across the river from the PCS Phosphate facility. It replaced the Aurora site (37013007) that was dislocated by nearby land clearing and future mining activities.

^j This monitor has been proposed for several years to support fine particle precursor monitoring at this site.

V. Ozone Monitoring Network

The North Carolina Division of Air Quality (NC-DAQ) operates an extensive ozone network covering the state from large urban areas to smaller rural areas and from valley communities to mountain top recreation and wilderness areas. This strong network has greatly benefited the state by enabling the NC-DAQ to learn about how ozone is transported to and within the state, to identify the parts of the state where the formation of ozone results in peak concentrations and to know where ozone concentrations do and do not exceed the National Ambient Air Quality Standards (NAAQS). By having sufficient monitors to provide understanding of ozone formation in an area, NC-DAQ was able to make strong arguments with the United States Environmental Protection Agency (EPA) to prevent certain areas of the state from being designated as nonattainment and was able to develop effective state implementation plans.

Table 15 provides the highest ozone design values for the monitors in North Carolina for the past five years. This information is important because the monitoring regulations promulgated by the U.S. EPA in 2006 require a monitor to be attaining the NAAQS for the past five years before the monitor can be shut down. On March 27, 2008, the U.S. EPA lowered the 8-hour ozone standard to 0.075 parts per million. Currently 24 of the 40 monitors currently operating statewide have met an 8-hour ozone design value of 0.075 parts per million for the past five years. These monitors are located in the following areas of the state:

- The Raleigh MSA - Franklinton (37-069-0001) in Franklin, West Johnston (37-101-0002) in Johnston and Fuquay (370183-0016) in Wake County,
- The Winston-Salem MSA - Shiloh Church (37-067-0028) in Forsyth County,
- The Durham-Chapel Hill MSA - The Durham Armory (37-063-0015) in Durham County, Bushy Fork (37-145-0003) in Person County and Pittsboro (37-037-0004) in Chatham County,
- The Asheville MSA - Waynesville (37-087-0004/8) in Haywood County and Bent Creek (37-021-0030) in Buncombe County,
- The Fayetteville MSA - Wade (37-051-0008) and Golfview (37-051-1003) in Cumberland County,
- The Hickory-Lenoir-Morganton MSA - Lenoir (37-027-0003) in Caldwell County and Waggin Trail (37-003-0004), replaced by Taylorsville-Liledoun (37-003-0005), in Alexander County,
- The Wilmington MSA - Castle Hayne (37-129-0002) in New Hanover County,
- The Greenville MSA - Pitt County Ag Center (37-147-0006) in Pitt County,
- Rocky Mount MSA - Leggett (37-065-0099) in Edgecombe County,
- Mountain Top Sites - Joanna Bald (37-075-0001) in Graham County, Mount Mitchell (37-199-0004) in Yancey County, Purchase Knob (37-087-0036) and Frying Pan (37-087-0035) in Haywood County and
- Valley, Piedmont and Coastal Sites not in MSAs: Bryson City (37-173-0002) in Swain, Lenoir Community College (37-107-0004) in Lenoir, Jamesville (37-117-0001) in Martin and Linville Falls (37-011-0002) in Avery County.

Table 15 Summary of Ozone Concentrations Measured by the North Carolina Ozone Monitoring Network (2009 through 2013)^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-109-0004	Crouse	0.076	101%	2007-2009
37-119-0041 ^c	Garinger	0.083	111%	2010-2012
37-119-1005 ^c	Arrowood	0.077	103%	2010-2012
37-119-1009 ^c	County Line (U)	0.086	115%	2007-2009
37-159-0021	Rockwell	0.083	111%	2007-2009
37-159-0022	Enochville	0.083	111%	2007-2009
37-179-0003	Monroe Middle School	0.076	101%	2007-2009

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-069-0001	Franklinton	0.074	99%	2007-2009
37-101-0002	West Johnston	0.074	99%	2010-2012
37-183-0014	Millbrook	0.076	101%	2007-2009
37-183-0016	Fuquay	0.075	100%	2010-2012

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-081-0013	Mendenhall	0.079	105%	2007-2009
37-157-0099	Bethany	0.078	104%	2007-2009

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-059-0002	Cooleemee	0.078	104%	2007-2009
37-059-0003	Mocksville	0.073	97%	2010-2012
37-067-0022 ^d	Hattie Ave. (U)	0.078	104%	2010-2012
37-067-0028 ^d	Shiloh Church	0.073	97%	2008-2010
37-067-0030 ^d	Clemmons	0.076	101%	2010-2012
37-067-1008 ^d	Union Cross	0.075	100%	2010-2012

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-037-0004	Pittsboro	0.069	92%	2007-2009
37-063-0015	Durham Armory	0.074	99%	2007-2009
37-145-0003	Bushy Fork	0.074	99%	2007-2009

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-021-0030 ^e	Bent Creek	0.069	92%	2007-2009
37-087-0004	Waynesville	0.068	91%	2007-2009
37-087-0008	Waynesville Elem School	0.065	87%	2010-2012

Table 15 Summary of Ozone Concentrations Measured by the North Carolina Ozone Monitoring Network (2009 through 2013)^a

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-051-0008	Wade	0.073	97%	2007-2009
37-051-1003	Golfview	0.074	99%	2007-2009

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-003-0004	Waggin Trail	0.073	97%	2007-2009
37-027-0003	Lenoir	0.071	95%	2007-2009

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-129-0002	Castle Hayne	0.063	84%	2010-2012

Greenville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-147-0006	Pitt Co. Ag Center	0.071	95%	2010-2012

Rocky Mount Metropolitan Statistical Area

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-065-0099	Leggett	0.073	97%	2007-2009

Not in a Metropolitan Statistical Area – Mountain Top Sites

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-075-0001 ^f	Joanna Bald	0.073	97%	2008-2010
37-087-0035	Fry Pan	0.074	99%	2007-2009
37-087-0036	Purchase knob	0.074	99%	2007-2009
37-199-0004	Mount Mitchell	0.071	95%	2010-2012

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Highest 8-Hour Ozone Design Value for 2009-2013		
		Value (parts per million)	Percent of NAAQS ^b	Year
37-011-0002	Linville Falls	0.067	89%	2008-2010
37-033-0001	Cherry Grove	0.076	101%	2007-2009
37-077-0001	Butner	0.077	103%	2007-2009
37-107-0004	Lenoir community College	0.071	95%	2007-2009
37-117-0001	Jamesville	0.071	95%	2007-2009
37-173-0002	Bryson City	0.064	85%	2008-2010

^a All monitors use an Instrumental Ultra Violet method (Air Quality System (AQS) Method Code 047).

^b The National Ambient Air Quality Standard for an 8-hour period is 0.075 parts per million. Attainment is based on the average of the fourth highest values for three consecutive ozone seasons. The ozone season for North Carolina is from April 1 through October 31.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^e Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

^f This monitor started on April 3, 2003. The monitor is owned by the United States Forest Service and operated by the North Carolina Division of Air Quality (NC-DAQ).

However, none of these monitors meets the additional requirement of having less than 10 percent probability of exceeding 80 percent of the NAAQS during the next three years. Thus, they are not eligible to be shut down based on their design values alone.

Other ozone monitors that could be considered for shut down are those monitors that exceed the minimum number of monitors required in 40CFR58 Appendix D Table D-2 provided in Figure 30. The latest estimated population of the Metropolitan Statistical Area (MSA) and the most recent ozone 8-hour design value for the area determines the number of required monitors for an area.

TABLE D-2 OF APPENDIX D TO PART 58.—
SLAMS MINIMUM O₃ MONITORING REQUIREMENTS

MSA population ^{1,2}	Most recent 3-year design value concentrations $\geq 85\%$ of any O ₃ NAAQS ³	Most recent 3-year design value concentrations $< 85\%$ of any O ₃ NAAQS ^{3,4}
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 ⁵	1	0

¹Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

²Population based on latest available census figures.

³The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

⁴These minimum monitoring requirements apply in the absence of a design value.

⁵Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Figure 30. 40 CFR 58 Appendix D Table D-2

Table 16 provides the 2013 estimated population for the MSAs in North Carolina, the design values for 2011-2013, the number of required monitors based on Appendix D and the number of current monitors operated by the NC-DAQ and the local programs. Currently, the NC-DAQ and the local programs operate at least the minimum number of required monitors in every MSA except for the Virginia Beach-Norfolk-New Port News and the Myrtle Beach-Conway-North Myrtle Beach MSAs. The NC-DAQ has a written agreement with the Virginia Department of Environmental Quality (VDEQ), Office of Air Quality Monitoring, that VDEQ will maintain the minimum required number of monitors for the Virginia Beach-Norfolk-New Port News MSA (see Appendix H. Monitoring Agreement Between Virginia and North Carolina for the Virginia Beach-Norfolk-New Port News Metropolitan Statistical Area). The Office of Management and Budget changed the Myrtle Beach –Conway-North Myrtle Beach MSA definition in February 2013 to include Brunswick County in North Carolina. Adding Brunswick County to the MSA resulted in the MSA exceeding the 350,000 population threshold for a required ozone monitor. The NC DAQ and the South Carolina Department of Health and Environmental Control are working together to determine who will operate the necessary monitor, where to put the monitor and what the monitoring agreement will say. Details on this monitor will be included in the 2015 network monitoring plan. Brunswick County was formerly part of the Wilmington (NC) MSA and for many years was characterized by the Castle Hayne ozone monitor. As noted in Table 15, Castle Hayne’s

highest design value during the past five years was 63 ppb. It has never violated the ozone standard.

Table 16 Design Values and Required Ozone Monitors for North Carolina Metropolitan Statistical Areas (MSA)

MSA	Population Estimate (2013) ^a	2013 Ozone 8-Hour Design Value (As percent of NAAQS) ^b	Number of Monitors operated in North Carolina	
			Required	Current
Charlotte-Concord- Gastonia	2,335,358	104	2	6 ^c
Virginia Beach-Norfolk-Newport News, VA-NC	1,707,369	<100	2	0 ^d
Raleigh	1,214,516	95	2	4
Greensboro-High Point	741,065	96	2	2
Winston-Salem	650,820	98	2	5
Durham-Chapel Hill	534,578	92	2	3
Asheville	437,657	92	2	2
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	404,951	Not Available	1	0 ^e
Fayetteville	377,193	92	2	2
Hickory-Lenoir-Morganton	363,572	88	2	2
Wilmington	268,601	85	1	1
Jacksonville	185,220	Not Available	0	0
Greenville	174,263	92	1	1
Burlington	154,378	Not Available	0	0
Rocky Mount	150,667	92	1	1
New Bern	127,657	Not Available	0	0
Goldsboro	124,583	Not Available	0	0

^a Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013; Source: U.S. Census Bureau, Population Division; Release Date: March 2014, available on the world wide web at <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

^b The National Ambient Air Quality Standard for an 8-hour period is 0.075 parts per million. Attainment is based on the average of the 4th highest value over three consecutive ozone seasons. Values of 0.075 (100 %) and below are considered to be attaining the National Ambient Air Quality Standard.

^c South Carolina Department of Health and Environment operates an additional monitor in York County, South Carolina.

^d Virginia Department of Environmental Quality (VDEQ), Office of Air Quality Monitoring operates three monitors in this MSA.

^e South Carolina Department of Health and Environment plans to begin operating a monitor in Horry County, South Carolina.

The NC-DAQ evaluated each MSA with more than the required monitors to determine if all of the current monitors in the MSA are still needed and providing valuable information. The local program monitors were not included in this analysis. The local program monitors were excluded because the decision on whether to continue

to operate them or shut them down is up to the local program and not the NC-DAQ. Thus, seven monitors were considered in this evaluation:

- Franklinton (37-069-0001) in the Raleigh MSA (see Figure 31) – this monitor is the downwind monitor for the Raleigh MSA when the wind is coming from the primary wind direction during the third quarter of the year when measured ozone concentrations are usually the highest. Its 2011-2013 design value is 0.068 parts per million. Although the NC-DAQ views this monitor as valuable, the NC-DAQ has considered shutting down this site if monitors are required in other parts of the state and additional resources are unavailable. The 8-hour maximum ozone concentrations at Franklin correlate well with the 8-hour maximum concentrations at Millbrook as shown in Figure 32 and Figure 33. In addition the monitor is not expected to be needed to help define nonattainment boundaries in the future. For these reasons, the NC-DAQ has decided to move forward with shutting down this ozone monitoring site at the end of the 2014 ozone monitoring season.



A is the Franklinton monitor; B is the West Johnston monitor; C is the Millbrook monitor; D is the Fuquay monitor. Circles represent the urban and neighborhood scales (4 to 50 Km for Franklinton and West Johnston and 0.5 to 4 Km for Millbrook and Fuquay).

Figure 31. Raleigh MSA Ozone Monitor Locations.

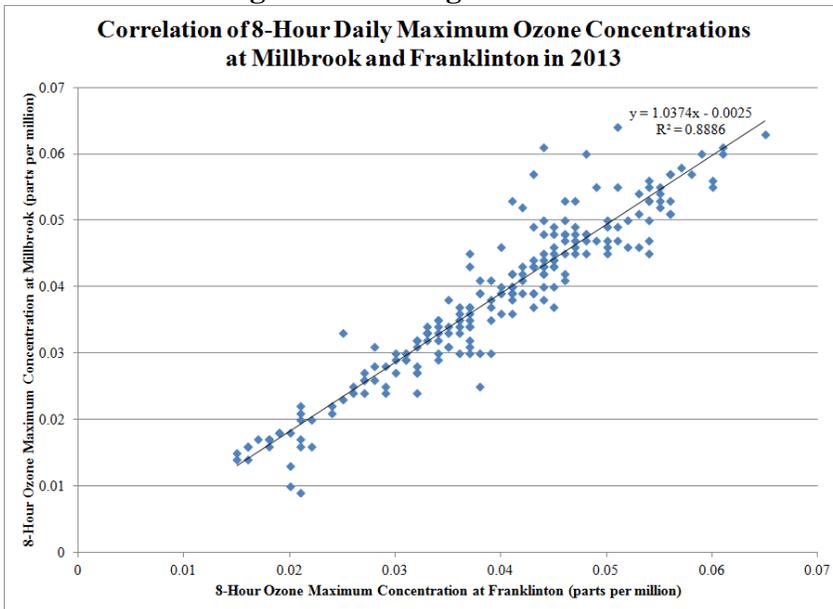


Figure 32. Correlation of 8-Hour Maximum Ozone Concentrations at Millbrook and Franklinton

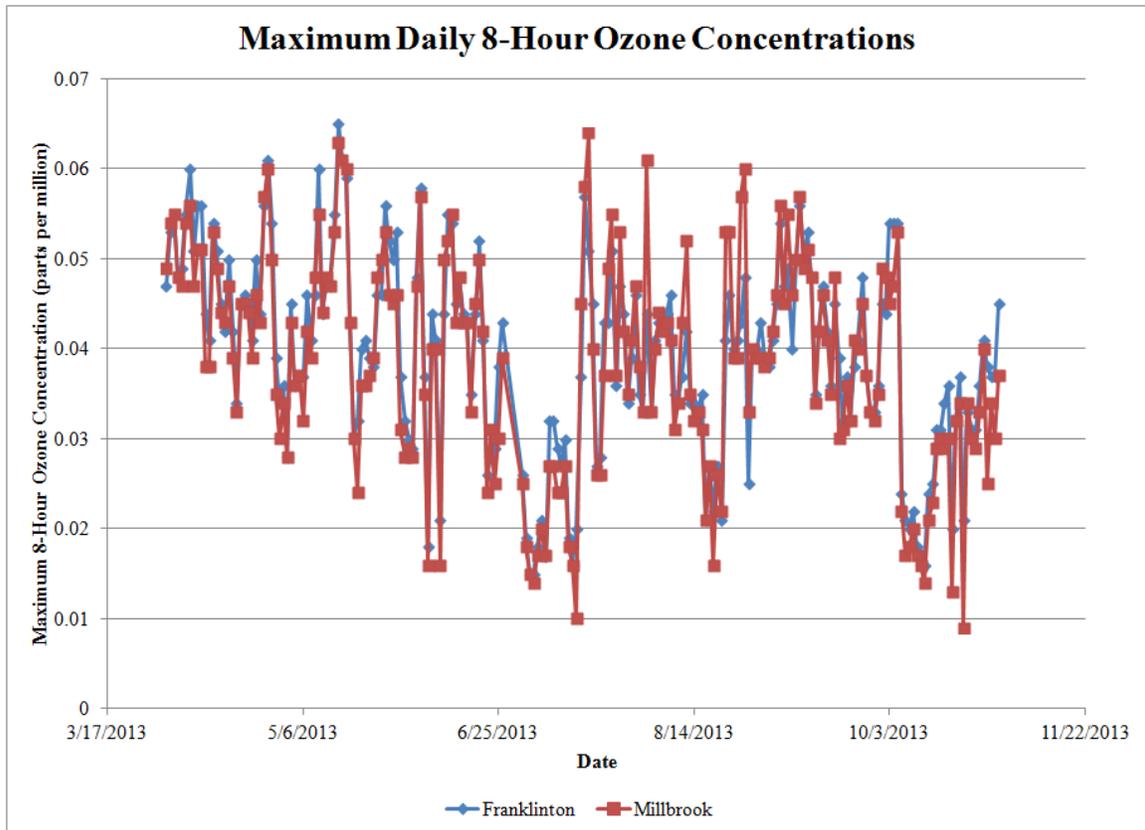


Figure 33. 2013 Maximum 8-Hour Daily Ozone Concentrations at Franklinton and Millbrook

- West Johnston (37-101-0002) in the Raleigh MSA (see Figure 31) – this monitor is the upwind ozone monitor for the Raleigh MSA when the wind is coming from the secondary wind direction during the third quarter of the year when measured ozone concentrations are usually the highest. In the past, it has also been valuable in helping to identify nonattainment boundaries. Its 2011-2013 design value is 0.070 parts per million. Johnston County has also been one of the fastest growing counties in North Carolina, as well as one of the 100 fastest growing counties in the nation, although it did not make it on either list the last two years. The NC-DAQ views this monitor as being a significant monitor for attainment and maintenance plan development for the Triangle (Raleigh-Durham) area.
- Mocksville (37-059-0003) in the Winston-Salem MSA (see Figure 34) – this monitor was established in 2010 to replace the Cooleemee monitor which was the 8-hour ozone design value monitor in the MSA. Model results indicated that the Mocksville monitor would also measure maximum ozone concentrations; however, Hattie Avenue reads higher than Mocksville almost 75 percent of the time. Because of its strategic location between the Charlotte and Winston-Salem MSAs and between the major interstates I-77 and I-40, this monitor provides valuable information regarding the transport of ozone out of Charlotte and into Winston-Salem for planning and forecasting. It is also helpful in identifying nonattainment boundaries. However, comparison of the daily maximum 8-hour ozone concentrations at Mocksville with those measured at Clemmons School in 2013

(Figure 35 and Figure 36) indicate the values are well correlated and the same information is provided by the Clemmons School monitor. Thus, the NC-DAQ will shut down this ozone monitoring station at the end of 2014.

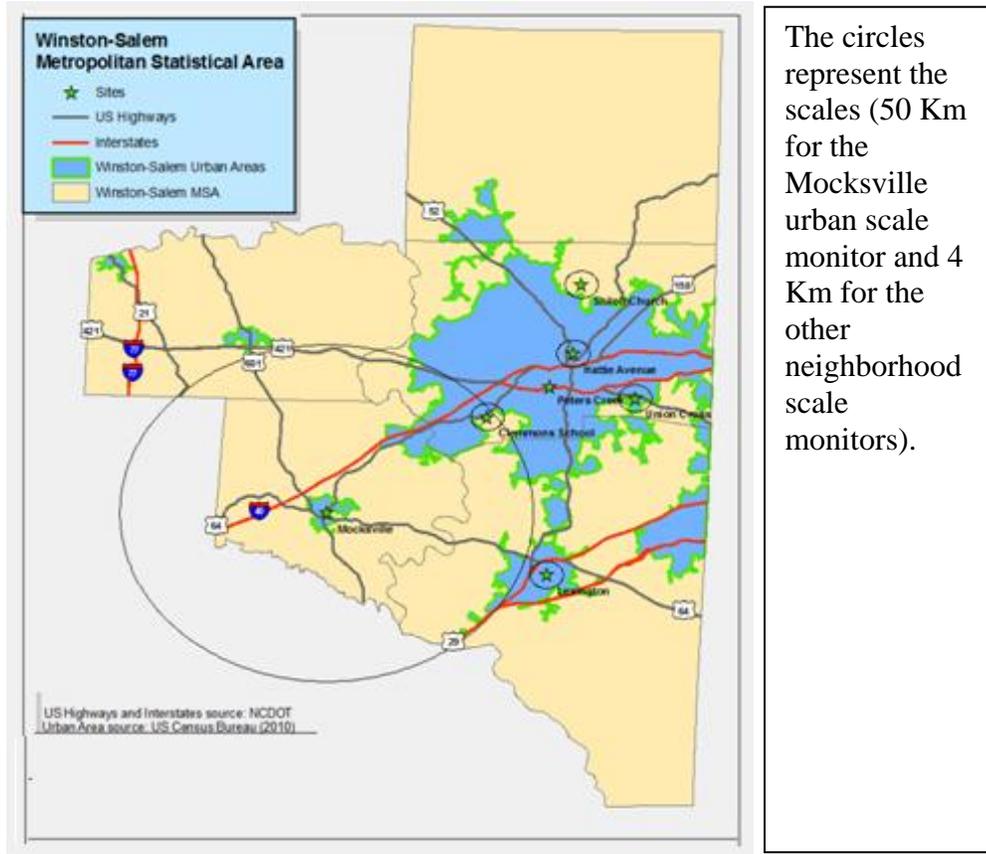


Figure 34. Winston Salem MSA Ozone Monitor Locations.

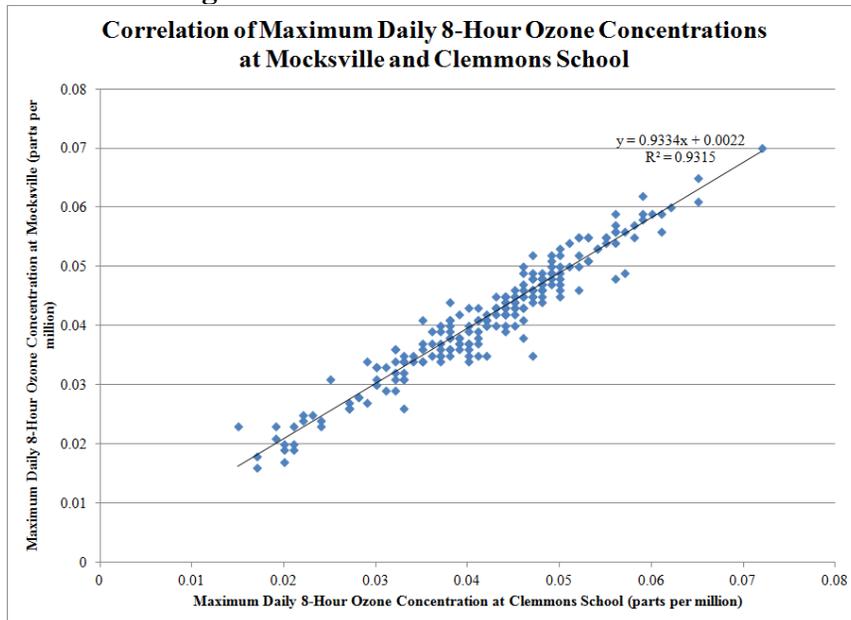


Figure 35. Correlation of Maximum Daily 8-Hour Ozone Concentrations at Mockville and Clemmons School

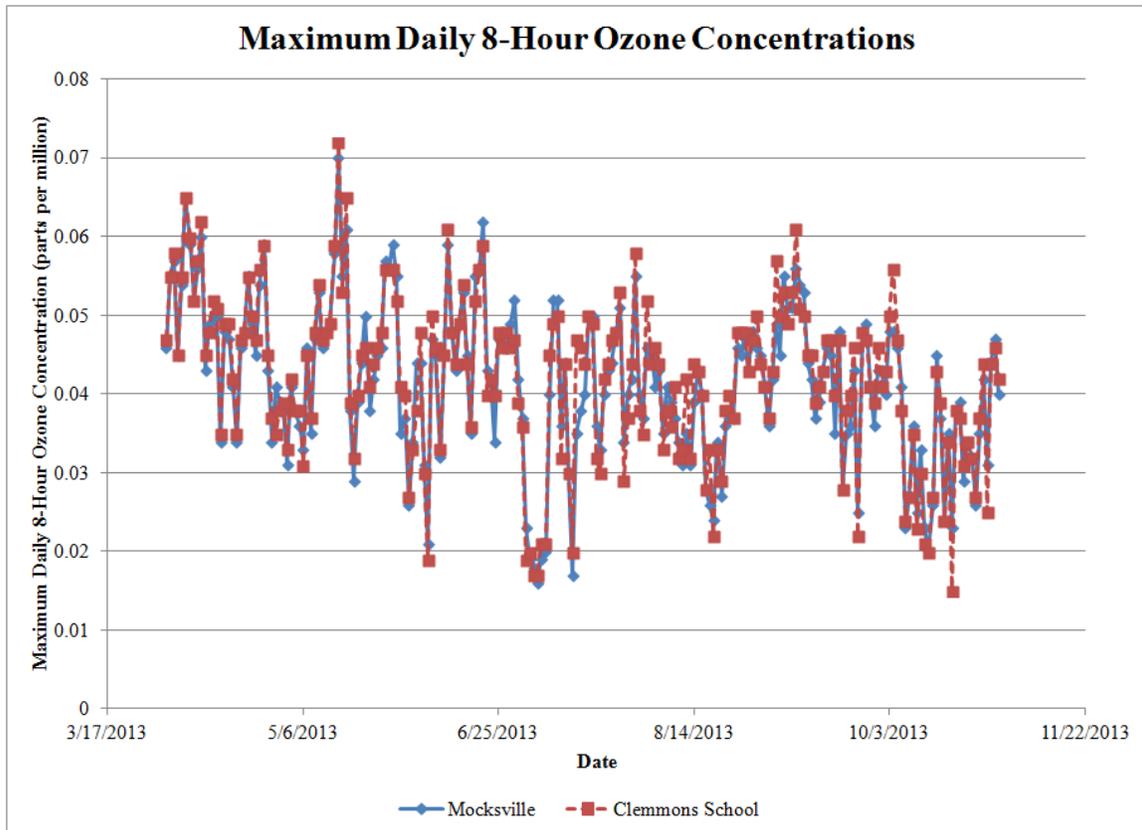


Figure 36. Maximum Daily 8-Hour Ozone Concentrations at Mocksville and Clemmons School

- Bushy Fork (37-145-0003) in the Durham-Chapel Hill MSA (see Figure 37) – although this monitor provides valuable information on model performance, the daily 8-hour maximum ozone concentrations measured at this site correlate well with those measured at Cherry Grove (see Figure 38 and Figure 39). As a result, the NC-DAQ plans to shut down this monitoring site at the end of the 2014 ozone season.



A is the Bushy Fork monitoring site; B is the Durham Armory monitoring site; C is the Pittsboro monitoring site. Circles show the scale of representation for the monitor: urban scale for Pittsboro and Bushy Fork (4 to 50 kilometers) and neighborhood scale for Durham Armory (0.5 to 4 kilometers).

Figure 37. Location of Ozone Monitors in the Durham-Chapel Hill MSA.

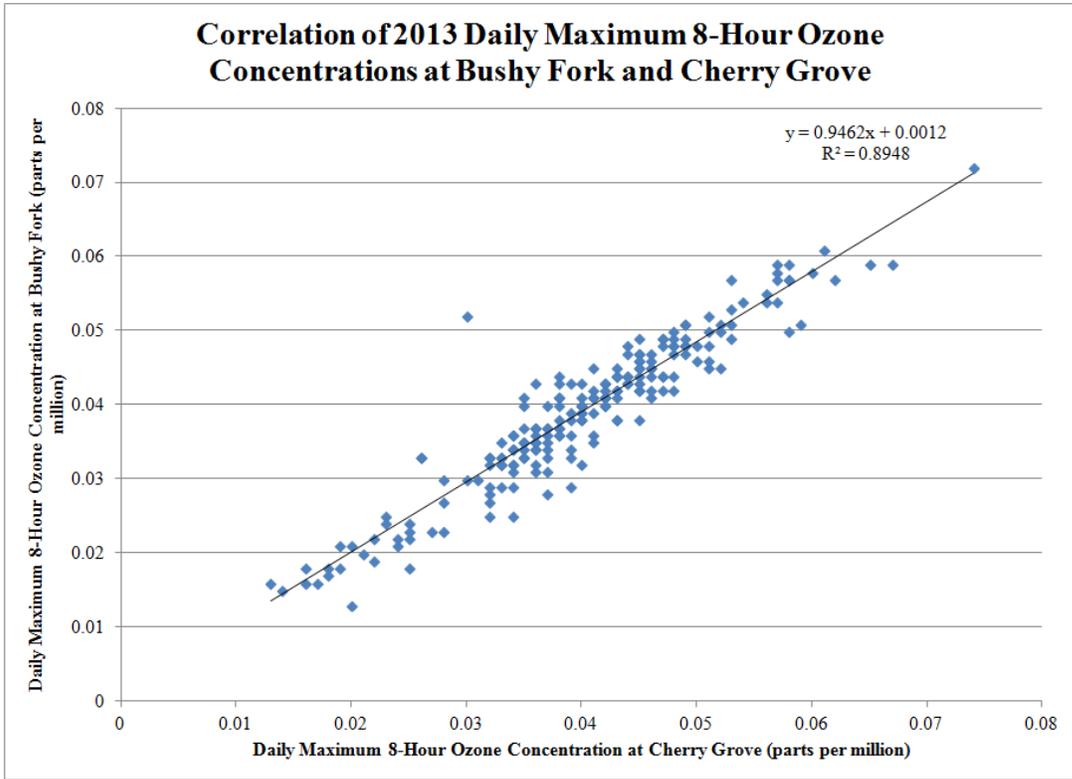


Figure 38. Correlation of Daily Maximum 8-Hour Ozone Concentrations at Bushy Fork and Cherry Grove

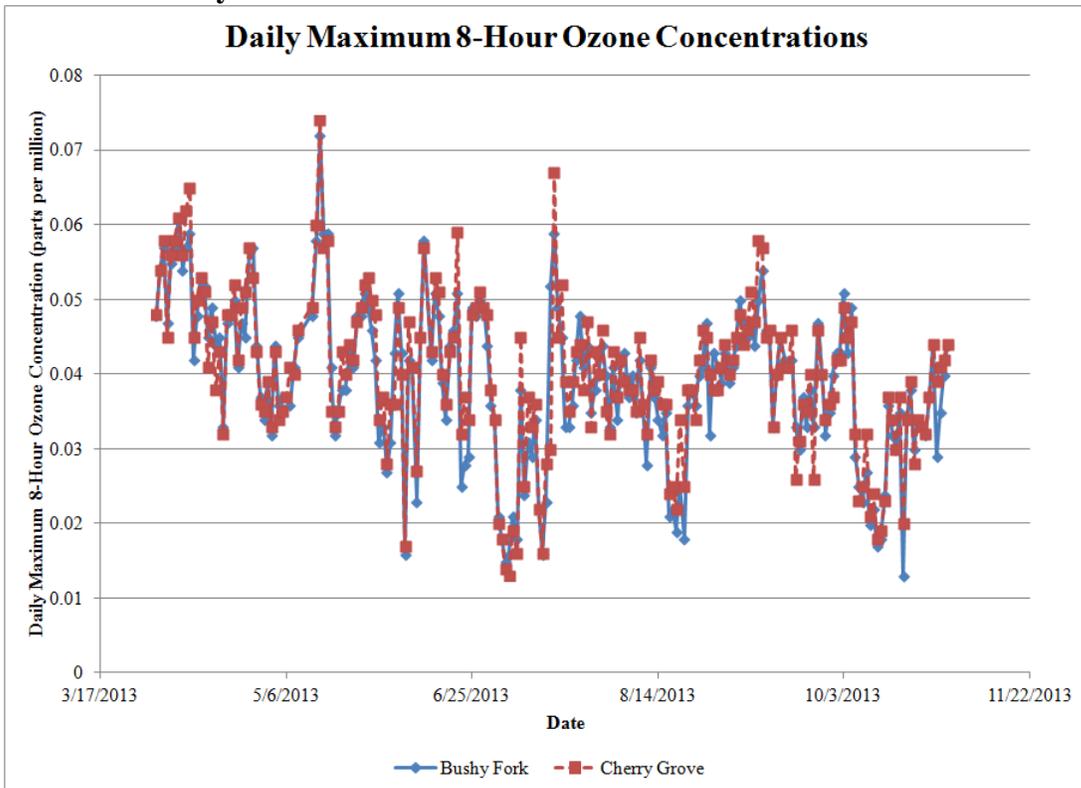


Figure 39. Daily Maximum 8-Hour Ozone Concentrations at Bushy Fork and Cherry Grove

- Monroe Middle School (37-179-0003) in the Charlotte-Gastonia-Concord MSA (see Figure 40) – this monitor provides valuable information for ozone forecasting in the Charlotte area. Because it is attaining the standard, these data are also used to justify excluding part of Union County from the Metrolina Nonattainment area. Union County is one of the fastest growing counties in North Carolina and has been one of the fastest growing counties in the nation, although it did not make it on the top 100 list this year. It is also located in the state’s largest MSA. The NC-DAQ views this monitor as being a significant monitor for attainment and maintenance plan development for the Metrolina (Charlotte-Concord-Gastonia) area.

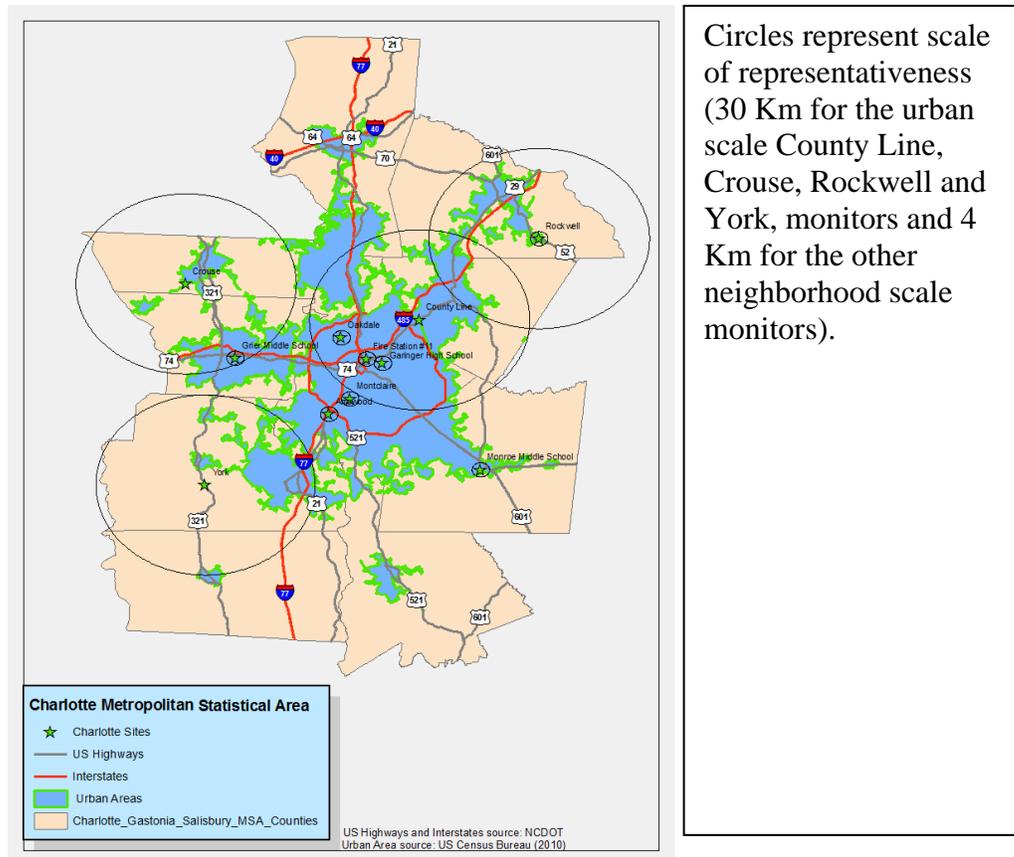


Figure 40. Charlotte MSA North Carolina Ozone Monitors.

- Crouse (37-109-0004) in the Charlotte-Gastonia-Concord MSA (see Figure 40) – this monitor provides valuable spatial information for ozone forecasting in the Charlotte area. Elimination of the Crouse monitor would leave a hole in the ozone network in the area to the west of Charlotte. The data from this monitor is also valuable in helping to determine nonattainment boundaries and keeping Lincoln County or parts of Lincoln County from being designated as nonattainment. The NC-DAQ views this monitor as being a significant monitor for attainment and maintenance plan development for the Metrolina area.
- Rockwell (37-159-0021) in the Charlotte-Gastonia-Concord MSA (see Figure 40) – the ozone measured at Rockwell is sometimes some of the highest ozone measured in the Metrolina area. NC-DAQ also expanded monitoring at this site in the past

decade and believes the information collected here is important in adding to our understanding of pollution formation and transport in the Piedmont area. Rockwell is downwind of Charlotte and provides information on the pollution being transferred out of Charlotte into the Winston-Salem area. The NC-DAQ views this monitor as being a significant monitor for attainment and maintenance plan development. As a result the NC-DAQ plans to retain the Rockwell monitoring site into the future.

The NC DAQ also evaluated the fastest growing areas in the state. Of the 10 fastest growing counties in North Carolina listed in Table 1, four of those counties currently do not have an ozone monitor:

- Brunswick County (growth of 7.3 percent between April 1, 2010 and July 1, 2013 and the 64th fastest growing county in the nation) – This county is impacted by growth in the Wilmington, North Carolina and North Myrtle Beach, South Carolina, areas. As of February 2013 Brunswick County is one of two counties making up the Myrtle Beach-Conway-North Myrtle Beach MSA. Before February 2013 Brunswick County was part of the Wilmington MSA. In 2013 Brunswick County petitioned unsuccessfully to be restored to the Wilmington MSA. The Myrtle Beach-Conway-North Myrtle Beach MSA now has a population exceeding 350,000 so an ozone monitor is required. Based on ozone monitoring at Castle Hayne in the Wilmington MSA, the design value for the Myrtle Beach-Conway-North Myrtle Beach MSA is expected to be around 85 percent of the standard. The NC-DAQ is working with the SCDHEC to establish a monitoring site in the Myrtle Beach-Conway-North Myrtle Beach MSA.
- Harnett County (growth of 10,309 people and 9.0 percent between April 1, 2010 and July 1, 2013 and the 41st fastest growing county in the nation) – This county is located between Raleigh to the north and Fort Bragg and the Fayetteville MSA to the south, two rapidly growing areas. As shown in Figure 41 there are five ozone monitors surrounding Harnett County (West Johnston to the northeast, Wade to the south, Blackstone to the west, Pittsboro to the northwest and Fuquay to the north). Thus, the NC-DAQ has no plans to monitor for ozone in Harnett County at this time.

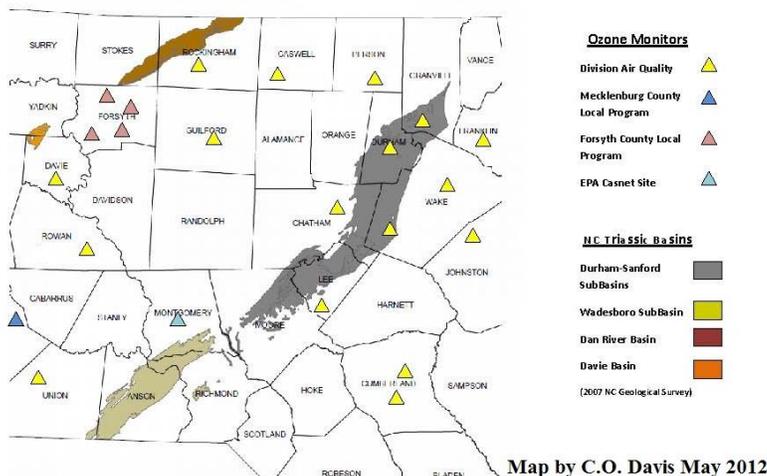


Figure 41. Ozone monitors surrounding Harnett County

- Hoke County (growth of 9.3 percent between April 1, 2010 and July 1, 2013 and the 32nd fastest growing county in the nation) – This county is part of the Fayetteville MSA. The NC DAQ currently operates two ozone monitors in the Fayetteville MSA as required by 40 CFR 58 Appendix D. The VISTAS Unmonitored Areas Analysis for ozone in 2012 (see Figure 42) indicates that expected ozone levels in Hoke County would be similar to the concentrations measured by the Wade monitor in Cumberland County. Currently this monitor has a design value of 0.068 parts per million. As a result the NC DAQ has no plans to monitor for ozone in Hoke County at this time.

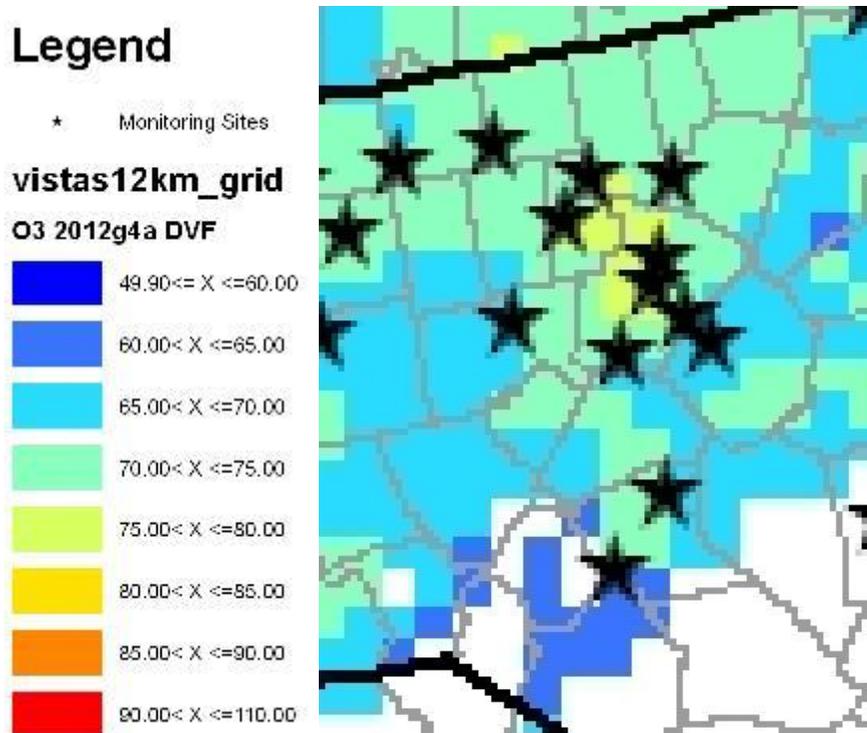


Figure 42. VISTAS Unmonitored Areas Analysis Map for Harnett and Hoke Counties

- Pender County (estimated growth of 1,146 people (2.1 percent) between July 1, 2012 and July 1, 2013, the 98th fastest growing county in the nation) – this county is in the Wilmington MSA. Currently, the NC-DAQ is required to operate one monitor in the MSA. This monitor is located at Castle Hayne in New Hanover County. The Castle Hayne monitor indicates that the ozone concentrations on the coast are currently at 85 percent of the NAAQS. The VISTAS unmonitored area analysis for Pender County shown in Figure 43 indicates that the ozone levels in Pender are lower than the levels at Castle Hayne. As a result the NC DAQ has no plans to monitor for ozone in Pender County at this time.

Legend

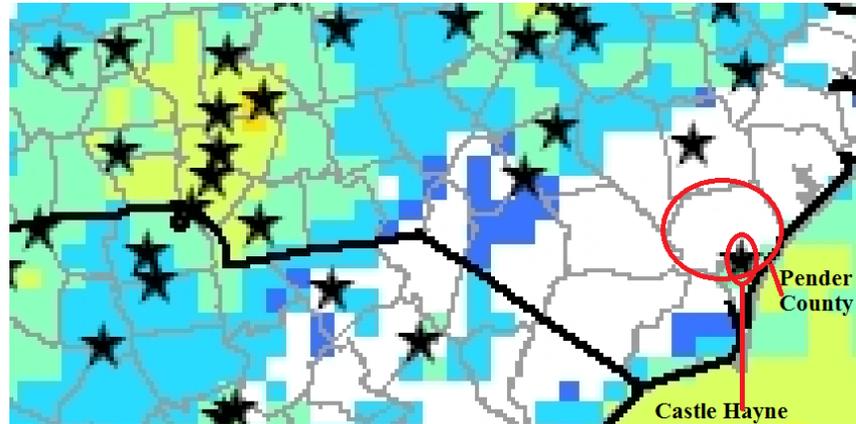


Figure 43. VISTAS Unmonitored Area Analysis for Ozone in 2012

In February 2014, the NC-DAQ learned that the property where the Golfview (37-051-0008) monitor is located in Cumberland County will be sold sometime this year. The NC-DAQ expects to be evicted from the site by the new property owner and is working on obtaining permission to move the monitor to a nearby school property (see subsection 1. Monitoring Site Relocations in the Fayetteville MSA in Section II. Summary of Proposed Changes for more details). Two ozone monitors were also relocated in 2013 because their locations no longer met 40 CFR Appendix E requirements: Waggin Trail and Bent Creek. Both relocations were discussed in the 2013 Network Monitoring Plan.

At this time, the NC DAQ recommends:

- Relocating the Golfview site to the nearby Honeycutt school;
- Not establishing any new ozone sites in 2014 or 2015;
- Operating the special purpose monitoring site in Lee County for baseline shale gas development monitoring, through the end of the 2015 ozone season (October 31, 2015) and then either shutting down the monitor or converting it to a SLAMS; and
- Shutting down the ozone monitors at Franklinton, Bushy Fork and Mocksville at the end of the 2014 ozone season.

The locations of the current ozone-monitoring sites are provided in Table 17. All monitors listed in Table 17 are suitable for comparison to the National Ambient Air Quality Standards and meet the requirements of Appendices A, C, D and E of Part 58. All of these monitors use the U.S. EPA equivalent method designation EQOA-0880-047. The locations of the monitors are shown in Figure 44.

Table 18 provides the monitor type, operating schedules, monitoring objectives and scales for all of the current and proposed monitors in the North Carolina Ozone Monitoring Network. All monitors operate on an hourly schedule from April 1 through October 31 each year. Several of the monitors operate year-round. Table 19 lists the statement of purpose for each monitor in the North Carolina Ozone Monitoring Network and also provides any proposed changes to the network.

Table 17 North Carolina Ozone Monitoring Network – Monitor Locations^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-109-0004	Crouse	1487 Riverview Road	Lincolnton	-81.276750	35.438556
37-119-0041 ^b	Garinger	1130 Eastway Drive	Charlotte	-80.785683	35.240100
37-119-1005 ^b	Arrowood	400 Westinghouse Blvd.	Charlotte	-80.919532	35.113164
37-119-1009 ^b	County Line	29 N@ Mecklenburg Cab Co	Charlotte	-80.695000	35.347222
37-159-0021	Rockwell	301 West Street	Rockwell	-80.395039	35.551868
37-179-0003	Monroe Middle School	701 Charles Street	Monroe	-80.540833	34.973889

Raleigh Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-069-0001	Franklinton	431 South Hillsborough Street	Franklinton	-78.463719	36.096189
37-101-0002	West Johnston	1338 Jack Road ^c	Clayton	-78.461944	35.590833
37-183-0014	Millbrook	3801 Spring Forest Road	Raleigh	-78.574167	35.856111
37-183-0016	Fuquay	201 North Broad Street	Raleigh	-78.792500	35.596944

Greensboro-High Point Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-081-0013	Mendenhall	205 Willoughby Blvd.	Greensboro	-79.810456	36.100711
37-157-0099	Bethany	6371 NC 65	Bethany	-79.859167	36.308889

Winston-Salem Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-059-0003	Mocksville	220 Cherry Street	Mocksville	-80.557278	35.897068
37-067-0022 ^d	Hattie Ave.	1300 block of Hattie Avenue	Winston-Salem	-80.226667	36.110556
37-067-0028 ^d	Shiloh Church	6496 Baux Mountain Road	Winston-Salem	-80.215833	36.203056
37-067-0030 ^d	Clemmons	Fraternity Church Road	Clemmons	-80.342000	36.026000
37-067-1008 ^d	Union Cross	3656 Piedmont Memorial Drive	Union Cross	-80.143889	36.050833

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-037-0004	Pittsboro	325 Russett Run Road	Pittsboro	-79.159722	35.757222
37-063-0015	Durham Armory	801 Stadium Drive	Durham	-78.905417	36.032944
37-145-0003	Bushy Fork	Highway 49 South	Bushy Fork	-79.091970	36.306965

Asheville Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-021-0030 ^e	Bent Creek	Route 191 South	Asheville	-82.599860	35.500102
37-087-0008	Waynesville E.S.	2236 Asheville Road	Waynesville	-82.963370	35.507160

Fayetteville Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-051-0008	Wade	7112 Covington Lane	Wade	-78.728035	35.158686
37-051-1003	Golfview	3625 Golfview Road	Hope Mills	-78.962500	34.968889

Table 17 North Carolina Ozone Monitoring Network – Monitor Locations ^a

Hickory Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-003-0005	Liledoun	700 Liledoun Road	Taylorsville	-81.191	35.9139,
37-027-0003	Lenoir	219 Nuway Circle	Lenoir	-81.530278	35.935833

Wilmington Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-129-0002	Castle Hayne	6028 Holly Shelter Road	Castle Hayne	-77.838611	34.364167

Greenville Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-147-0006	Pitt County	403 Government Cir	Greenville	-77.358050	35.638610

Rocky Mount Metropolitan Statistical Area

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-065-0099	Leggett	7589 NC Hwy 33-NW	Leggett	-77.582778	35.988333

Not in Metropolitan Statistical Areas – Mountain Top Sites

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-075-0001 ^f	Joanna Bald	Forest Road 423 Spur	Robbinsville	-83.795620	35.257930
37-087-0035	Fry Pan	State Rd 450, Blue Ridge Pkwy Mile 409	Pisgah Forest	-82.792500	35.379167
37-087-0036	Purchase Knob	6905 Purchase Road	Waynesville (GSMNP)	-83.077500	35.590000
37-199-0004	Mount Mitchell	2388 State Hwy 128	Burnsville	-82.264944	35.765413

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site ID Number	Site Location				
	Site Name	Street Address	City	Longitude	Latitude
37-011-0002	Linville Falls	100 Linville Falls road	Linville Falls	-81.933056	35.972222
37-033-0001	Cherry Grove	7074 Cherry Grove Road	Reidsville	-79.467417	36.307033
37-077-0001	Butner	800 Central Ave	Butner	-78.768056	36.141111
37-105-0002	Blackstone	4110 Blackstone Drive	Sanford	-79.288700	35.432500
37-107-0004	Lenoir Community College	231 Highway 58 S	Kinston	-77.568792	35.231459
37-117-0001	Jamesville	1210 Hayes Street	Jamesville	-76.897820	35.810690
37-173-0002	Bryson City	Parks & Rec Bldg, Center Street	Bryson City	-83.443697	35.435509

^a All monitors use an Instrumental Ultra Violet method (Air Quality System (AQS) Method Code 047). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of Part 58. All monitors use the U.S. EPA equivalent method designation EQOA-0880-047.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c The monitor is located 10 meters South of Jack Road, which had a 2002 average daily traffic count of 3,700. This location meets the requirements in Table E-1 for spacing between roadways and probes for neighborhood and urban scale monitors in operation before December 18, 2006, but does not meet the spacing requirements for a new site.

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^e Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

^f This monitor started on April 3, 2003. The monitor is owned by the United States Forest Service and operated by the North Carolina Division of Air Quality (NC DAQ).

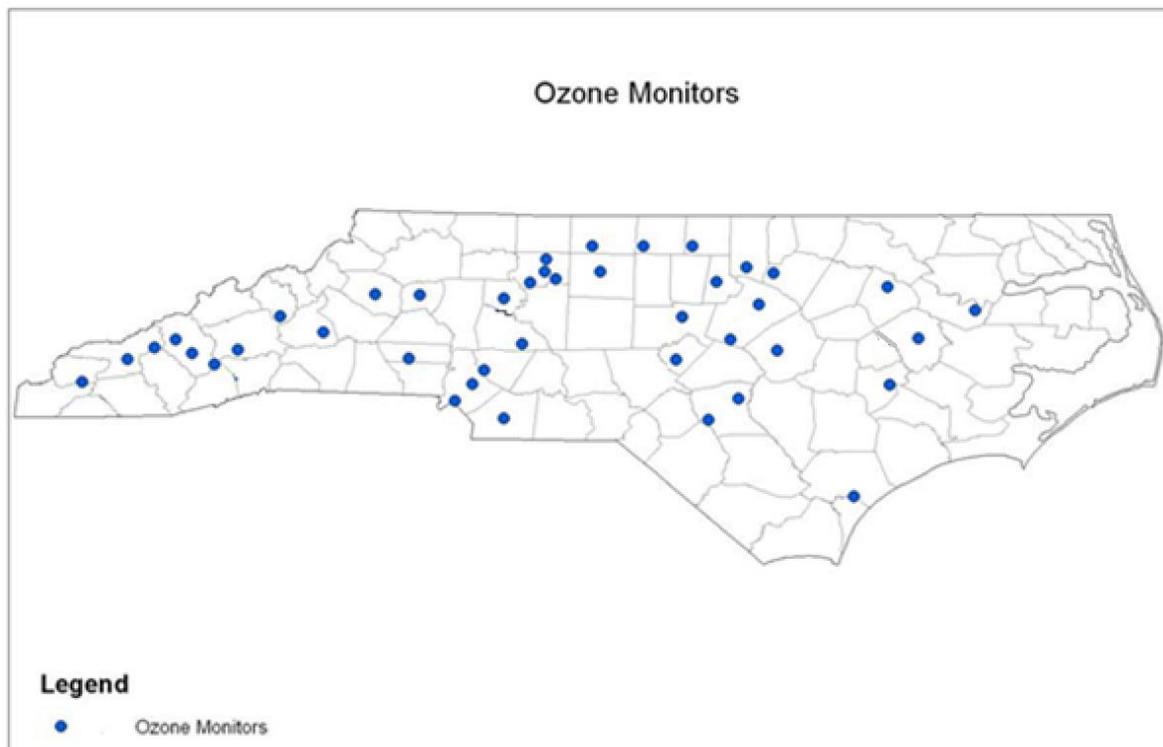


Figure 44. Location of 2014 Ozone Monitoring Stations

Table 18 Monitor Type, Operating Schedules, Monitoring Objectives and Scales for the North Carolina Ozone Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-109-0004	Crouse	SLAMS	4/1 to 10/31	General/Background	Urban
37-119-0041 ^c	Garinger	NCORE	1/1 to 12/31	Highest Concentration	Neighborhood
37-119-1005 ^c	Arrowood	SLAMS	4/1 to 10/31	Highest Concentration	Neighborhood
37-119-1009 ^c	County Line	SLAMS	4/1 to 10/31	Highest Concentration	Urban
37-159-0021	Rockwell	SLAMS	1/1 to 12/31	Highest Concentration	Urban
37-179-0003	Monroe Middle School	Special Purpose	4/1 to 10/31	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-069-0001	Franklinton	SLAMS	4/1 to 10/31	Population Exposure	Urban
37-101-0002	West Johnston	SLAMS	4/1 to 10/31	General/Background	Urban
37-183-0014	Millbrook	NCORE	1/1 to 12/31	Maximum Ozone Concentration/ Population Exposure	Neighborhood
37-183-0016	Fuquay	Other	4/1 to 10/31	Highest Concentration	Neighborhood

Greensboro-High Point Metropolitan Statistical Area

AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-081-0013	Mendenhall	SLAMS	4/1 to 10/31	Population Exposure	Urban
37-157-0099	Bethany	SLAMS	4/1 to 10/31	Highest Concentration	Urban

Table 18 Monitor Type, Operating Schedules, Monitoring Objectives and Scales for the North Carolina Ozone Monitoring Network ^a

Winston-Salem Metropolitan Statistical Area					
AQS Site Id No	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-067-0022 ^d	Hattie Ave.	Other	4/1 to 10/31	Population Exposure	Neighborhood
37-067-0028 ^d	Shiloh Church	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood
37-067-0030 ^d	Clemmons	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood
37-067-1008 ^d	Union Cross	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood
37-059-0003	Mocksville	SLAMS	4/1 to 10/31	Population Exposure	Urban

Durham-Chapel Hill Metropolitan Statistical Area					
AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-037-0004	Pittsboro	SLAMS	4/1 to 10/31	Upwind Background/ General/Background	Urban
37-063-0015	Durham Armory	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood
37-145-0003	Bushy Fork	SLAMS	4/1 to 10/31	Background/ Highest Concentration	Urban

Asheville Metropolitan Statistical Area					
AQS Site Id No	Site Name	Monitor Type	Operating Schedule	Monitoring Objective	Scale
37-021-0030	Bent Creek	SLAMS	Hourly, 4/1 to 10/31	Maximum Ozone Concentration/ Highest Concentration	Urban
39-087-0013 ^f	Waynesville ES	SLAMS	Hourly, 4/1 to 10/31	Population Exposure	Urban

Fayetteville Metropolitan Statistical Area					
AQS Site ID No	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-051-0008	Wade	SLAMS	4/1 to 10/31	Highest Concentration	Urban
37-051-1003	Golfview	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood

Hickory Metropolitan Statistical Area					
AQS Site ID No	Site Name	Monitor Type	Operating Schedule	Monitoring Objective	Scale
37-003-0005	Taylorsville -Liledoun	Special Purpose	Hourly, 4/1 to 10/31	Population Exposure	Urban
37-027-0003	Lenoir	SLAMS	Hourly, 4/1 to 10/31	General/ Background	Regional

Wilmington Metropolitan Statistical Area					
AQS Site ID No	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-129-0002	Castle Hayne	SLAMS	4/1 to 10/31	Population Exposure	Neighborhood

Greenville Metropolitan Statistical Area					
AQS Site ID No	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
371470006	Pitt Co Ag Center	SLAMS	4/1 to 10/31	General/Background	Regional

Rocky Mount Metropolitan Statistical Area					
AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-065-0099	Leggett	SLAMS	4/1 to 10/31	General/ Background	Regional

Not in a Metropolitan Statistical Area – Mountain Top Sites					
AQS Site ID No	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-075-0001 ^f	Joanna Bald	Other	4/1 to 10/31	Welfare Related Impacts/ General/Background	Regional
37-087-0035	Fry Pan	Other	4/1 to 10/31	Welfare Related Impacts/ General/Background	Regional
37-087-0036	Purchase Knob	Other	4/1 to 10/31	Welfare Related Impacts/ General/Background	Regional
37-199-0004	Mount Mitchell	Special Purpose	4/1 to 10/31	Welfare Related Impacts/ General/ Background/ Regional Transport	Regional

Table 18 Monitor Type, Operating Schedules, Monitoring Objectives and Scales for the North Carolina Ozone Monitoring Network ^a

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites					
AQS Site ID Number	Site Name	Monitor Type	Operating Schedule ^b	Monitoring Objective	Scale
37-011-0002	Linville Falls	Other	4/1 to 10/31	Welfare Related Impacts/ General/Background	Urban
37-033-0001	Cherry Grove	Other	4/1 to 10/31	General/Background	Urban
37-077-0001	Butner	SLAMS	4/1 to 10/31	Highest Concentration	Urban
37-105-0002	Blackstone Road	Special Purpose	1/1 to 12/31	General/Background	Urban
37-107-0004	Lenoir community College	Other	4/1 to 10/31	General/ Background	Neighborhood
37-117-0001	Jamesville	SLAMS	4/1 to 10/31	General/Background	Regional
37-173-0002	Bryson City	SLAMS	4/1 to 10/31	General/ Background	Neighborhood

^a All monitors use an Instrumental Ultra Violet method (Air Quality System (AQS) Method Code 047).
^b All monitors operate on an hourly schedule.
^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)
^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).
^e Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).
^f This monitor started on April 3, 2003. The monitor is owned by the United States Forest Service and operated by the North Carolina Division of Air Quality (NC DAQ).

Table 19 Statement of Purpose for the North Carolina Ozone Monitoring Network and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-109-0004	Crouse	Compliance w/NAAQS; SIP development.	None
37-119-0041 ^b	Garinger	Compliance w/NAAQS.	None
37-119-1005 ^b	Arrowood	Compliance w/NAAQS.	None
37-119-1009 ^b	County Line	Compliance w/NAAQS.	None
37-159-0021	Rockwell	Modeling. Ozone Precursor Monitoring. Compliance w/NAAQS.	None
37-179-0003	Monroe Middle School	Forecasting. Compliance w/NAAQS. SIP Development	None

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-069-0001	Franklinton	Downwind site for Raleigh MSA. Modeling. Real-time AQI reporting for the Raleigh MSA. Compliance w/NAAQS	Site will shut down on 10/31/2014
37-101-0002	West Johnston	Real-time AQI reporting for the Raleigh MSA. Compliance w/NAAQS. SIP development	None
37-183-0014	Millbrook	Maximum Concentration Site for Raleigh MSA. Ozone Precursor Monitoring Site. Real-time AQI reporting for the Raleigh MSA. Compliance w/NAAQS.	None
37-183-0016	Fuquay	Upwind Site for Raleigh MSA. Modeling. Real-time AQI reporting for the Raleigh MSA. Compliance w/NAAQS.	None

Table 19 Statement of Purpose for the North Carolina Ozone Monitoring Network and Proposed Changes to the Network ^a

Greensboro-High Point Metropolitan Statistical Area

AQS Site ID Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-081-0013	Mendenhall	Maximum concentration site downwind of the Greensboro-High Point MSA. Compliance w/NAAQS. Real-time AQI reporting for the Greensboro-Winston-Salem-High-Point CSA.	None
37-157-0099	Bethany	Maximum ozone concentration site downwind of the Winston-Salem MSA. Real-time AQI reporting for the Greensboro-Winston-Salem-High-Point CSA. Compliance w/NAAQS.	None

Winston-Salem Metropolitan Statistical Area

AQS Site ID Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-059-0003	Mocksville	Upwind site for the Greensboro-High Point MSA. Real-time AQI reporting. Compliance w/NAAQS.	Site will shut down on 10/31/2014
37-067-0022 ^c	Hattie Ave.	Urban Center City Site for Modeling. Real-time AQI reporting for the Greensboro-Winston-Salem-High-Point CMSA. Compliance w/NAAQS.	None
37-067-0028 ^c	Shiloh Church	Compliance w/NAAQS.	None
37-067-0030 ^c	Clemmons	Real-time AQI reporting for the Greensboro-Winston-Salem-High-Point CMSA. Compliance w/NAAQS.	None
37-067-1008 ^c	Union Cross	Compliance w/NAAQS.	None

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-037-0004	Pittsboro	Upwind Background site for Durham-Chapel Hill MSA. Modeling. Real-time AQI reporting for the Durham-Chapel Hill MSA. Compliance with the NAAQS.	None
37-063-0015	Durham Armory	Maximum concentration site in the Durham-Chapel Hill MSA. Ozone precursor monitoring site. Real-time AQI reporting for the Durham-Chapel Hill MSA. Compliance w/NAAQS.	None
37-145-0003	Bushy Fork	Compliance w/NAAQS.	Site will shut down on 10/31/2014

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-021-0030 ^d	Bent Creek	Industrial expansion monitoring for PSD modeling. Real-time AQI reporting. Compliance with the NAAQS.	None
37-087-0013	Waynesville E.S.	Low elevation (valley) site for Haywood County. Real-time AQI reporting. Modeling. Compliance w/NAAQS.	None

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-051-0008	Wade	Maximum concentration site in the Fayetteville MSA. Real-time AQI reporting for the Fayetteville MSA. Compliance w/NAAQS.	None
37-051-1003	Golfview	Upwind site in the Fayetteville MSA. Real-time AQI reporting for the Fayetteville MSA. Compliance with the NAAQS	Move to Honeycutt school

Table 19 Statement of Purpose for the North Carolina Ozone Monitoring Network and Proposed Changes to the Network ^a

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-003-0005	Taylorsville-Liledoun	Compliance w/NAAQS.	None
37-027-0003	Lenoir	Highest Ozone Precursor Concentration Site for Hickory MSA. . Real-time AQI reporting. Compliance w/NAAQS.	None

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-129-0002	Castle Hayne	Real-time AQI reporting. Compliance w/NAAQS.	None

Greenville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-147-0006	Pitt Ag Center	Real-time AQI reporting. Compliance w/NAAQS.	None

Rocky Mount Metropolitan Statistical Area

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-065-0099	Leggett	Real-time AQI reporting. Compliance with the NAAQS.	None

Not in a Metropolitan Statistical Area – Mountain Top Sites

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-075-0001 ^e	Joanna Bald	Operated in cooperation with the USFS. Located in a Class I area. Provides ozone data for PSD modeling for industrial expansion. Provides AQI data for recreational users. Modeling. Compliance w/NAAQS.	None
37-087-0035	Fry Pan	Operated in cooperation with the USFS. Located in a Class I area and collocated at an IMPROVE site. Provides ozone data for PSD modeling for industrial expansion. Provides AQI data for recreational users. Real-time AQI reporting for the Asheville MSA. Modeling. Compliance w/NAAQS.	None
37-087-0036	Purchase Knob	Operated in cooperation with the USFS. Located in a Class I area. Provides ozone data for PSD modeling for industrial expansion. Provides AQI data for recreational users. Real-time AQI reporting for the Asheville MSA. Modeling. Compliance w/NAAQS.	None
37-199-0004	Mount Mitchell	Provides ozone data for PSD modeling for industrial expansion. Provides AQI data for recreational users. Modeling. Compliance w/NAAQS.	None

Table 19 Statement of Purpose for the North Carolina Ozone Monitoring Network and Proposed Changes to the Network ^a

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Statement of Purpose	Proposal to Move or Change
37-011-0002	Linville Falls	Operated in cooperation with the USFS. Located in a Class I area and collocated at an IMPROVE site. Provides ozone data for PSD modeling for industrial expansion. Provides AQI data for recreational users. Modeling. Compliance w/NAAQS.	None
37-033-0001	Cherry Grove	Extreme downwind site for the Greensboro-High Point MSA. Modeling. Ozone Precursor monitoring site. Real-time AQI reporting for the Greensboro-Winston-Salem-High-Point CMSA. Compliance with the NAAQS	None
37-077-0001	Butner	Maximum concentration site downwind for the Durham-Chapel Hill MSA. Modeling. Real-time AQI reporting for the Raleigh-Durham-Chapel Hill CMSA. Compliance w/NAAQS.	None
37-105-0002	Blackstone Road	General/Background site for shale gas development study.	Will either end 10/31/15 or convert to SLAMS
37-107-0004	Lenoir Community College	Compliance w/NAAQS.	None
37-117-0001	Jamesville	Compliance w/NAAQS.	None
37-173-0002	Bryson City	Regional Transport and General Background Site. Low elevation (valley) mountain site on the NC side of the Great Smokey Mountains National Park. Modeling. Forecasting. Compliance w/NAAQS.	None

^a All monitors use an Instrumental Ultra Violet method (Air Quality System (AQS) Method Code 047).

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^d Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

^e This monitor started on April 3, 2003. The monitor is owned by the United States Forest Service and operated by the North Carolina Division of Air Quality (NC-DAQ).

VI. Particle Monitoring Network for Particles with Aerodynamic Diameters of 10 Micrometers or Less (PM₁₀)

Monitoring for particles of 10 micrometers or less aerodynamic diameter (PM₁₀) is currently being conducted in North Carolina at seven sites operated by the North Carolina Division of Air Quality (NC-DAQ) and at five sites operated by local programs. The data collected are used to determine human health effect exposures in Metropolitan Statistical Areas (MSAs) with over 500,000 people and to collect background levels for Prevention of Significant Deterioration (PSD) purposes. The NC-DAQ also uses PM₁₀ as a surrogate for PSD modeling for the state standard for total suspended solids (TSP).

Table 20 provides the highest PM₁₀ concentrations measured in North Carolina for the past five years. The monitoring regulations promulgated by the U.S. EPA in 2006 require a monitor to be attaining the NAAQS for the past five years before the monitor can be shut down. All PM₁₀ monitors operated in North Carolina in the last five years have attained the NAAQS and have reported values less than 80 percent of the standard. Thus, the only monitors that the U.S. EPA requires the state to operate are the ones required to meet the minimum monitoring requirements in 40CFR58 Appendix D Table D-4 provided in Figure 45 and those used to provide background data for PSD modeling.

TABLE D-4 OF APPENDIX D TO PART 58. PM₁₀ MINIMUM MONITORING REQUIREMENTS (NUMBER OF STATIONS PER MSA)¹

Population category	High concentration ²	Medium concentration ³	Low concentration ^{4,5}
>1,000,000	6-10	4-8	2-4
500,000-1,000,000	4-8	2-4	1-2
250,000-500,000	3-4	1-2	0-1
100,000-250,000	1-2	0-1	0

¹ Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.

² High concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding the PM₁₀ NAAQS by 20 percent or more.

³ Medium concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding 80 percent of the PM₁₀ NAAQS.

⁴ Low concentration areas are those for which ambient PM₁₀ data show ambient concentrations less than 80 percent of the PM₁₀ NAAQS.

⁵ These minimum monitoring requirements apply in the absence of a design value.

Figure 45. Table D-4 from 40CFR58 Appendix D

The 2013 estimated population of the Metropolitan Statistical Area (MSA) and the most recent PM₁₀ ambient concentration values for the area determines the number of required monitors for an area. Table 21 provides the 2013 estimated total population for the MSAs in North Carolina, the maximum ambient daily concentration values as percentage of the NAAQS for 2013, the number of required monitors based on 40CFR58 Appendix D Table D-4 and the number of current monitors operated by the NC-DAQ and the local programs.

Currently, the NC-DAQ and the local programs are operating the minimum number of required monitors in every MSA except for the Virginia Beach-Norfolk-New Port News and the Raleigh MSA. The NC-DAQ has a written agreement with the Virginia Department of Environmental Quality (VDEQ), Office of Air Quality Monitoring, that VDEQ will maintain the minimum required number of monitors for the Virginia Beach-Norfolk-New Port News MSA (see Appendix H. Monitoring Agreement Between Virginia and North Carolina for the Virginia Beach-Norfolk-New Port News

Metropolitan Statistical Area). The NC-DAQ received a waiver from the EPA for the second required monitor in the Raleigh MSA. The EPA granted the waiver because PM₁₀ values recorded in the Raleigh MSA have been less than 50 percent of the NAAQS except for when the existing monitor was impacted by an exceptional event on June 12, 2008.

Currently the NC-DAQ is operating two PM₁₀ monitors that may not be required by 40CFR58 Appendix D. These monitors are located at Hickory and William Owen School in Fayetteville. The monitors may not be required because Appendix D requires zero to one monitor for areas with populations less than 500,000 and measured concentrations less than 80 percent of the NAAQS. The NC-DAQ evaluated the purposes for these monitors and the use of the data from these monitors. The data from the William Owen monitor is used for PSD modeling so the NC-DAQ decided to continue operating this monitor. However, the PM₁₀ data from the Hickory monitor is not used for PSD modeling and, as shown in Figure 46, the data seems to be trending downward for the last eight years. Because the measured concentrations are less than 40 percent of the standard and trending downward, the population is less than 500,000 and the data are not used for permitting purposes, the NC-DAQ will shut down the PM₁₀ monitor at Hickory at the end of 2014.

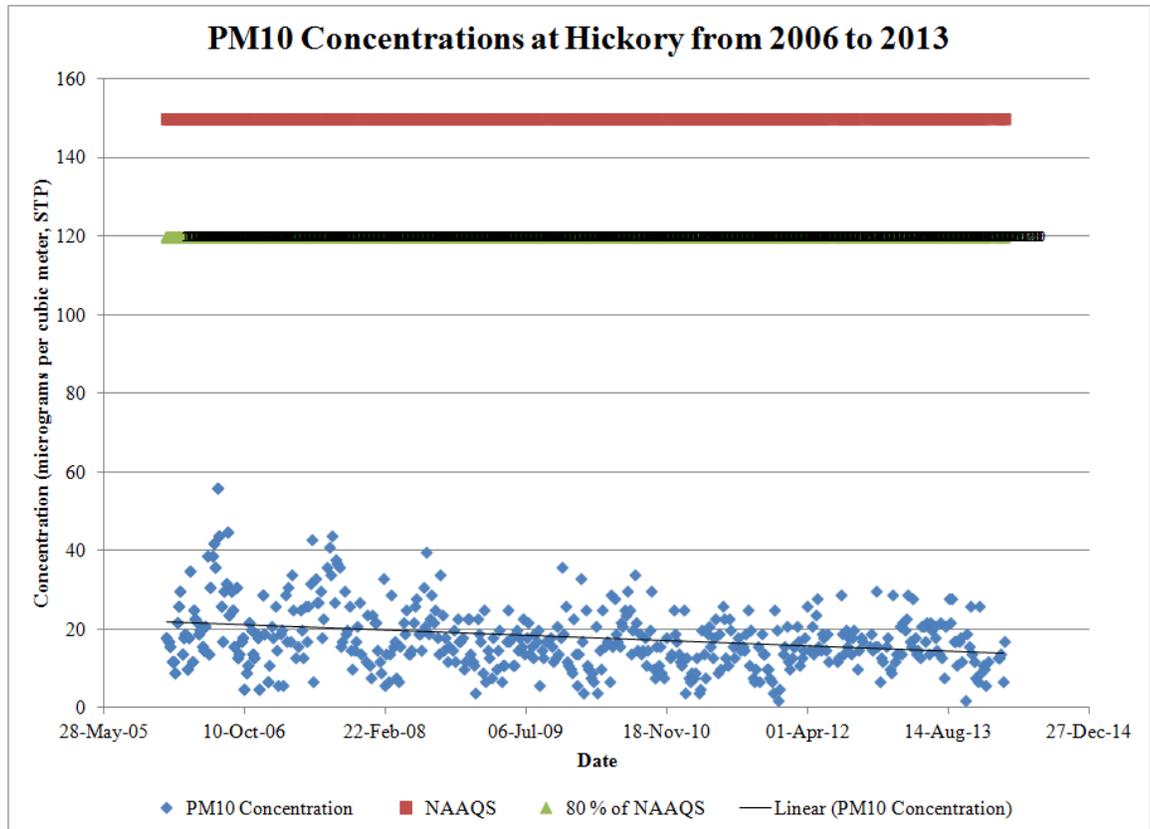


Figure 46. PM₁₀ Concentrations at Hickory Compared to the NAAQS

In 2011 the NC-DAQ modified its PM₁₀ PSD monitoring network by establishing a network of rotating background PM₁₀ sites. One to three PM₁₀ monitors operate each year and each site operates once every three years. Because the NC-DAQ decided to shut

down the Grier School particle monitoring site in Gastonia at the end of 2014, the rotating PM₁₀ monitor at Grier School will be replaced with a rotating PM₁₀ monitor at the Taylorsville Liledoun site. Thus, the six PM₁₀ background sites are:

- Candor and Marion, operating from March 2014 through February 2015;
- Jamesville operating from March 2015 through February 2016; and
- Kenansville, Cherry Grove and Taylorsville Liledoun, operating from April 2016 through March 2017.

Five of these six sites are also fine particle monitoring sites. Taylorsville Liledoun is an ozone monitoring site.

The monitoring regulations promulgated in 2006 include a method for measuring coarse particles. The coarse particle monitoring method measures coarse particles by the difference between the measured PM₁₀ concentration and the fine particle concentration measured using the same sampling and analytical method. The NC-DAQ purchased two coarse particle BAM monitors and plans to gradually convert the current manual PM₁₀ high volume samplers to PM₁₀ low volume samplers. Some of these sites can be used to measure both PM₁₀ and coarse particles.

Also, Mecklenburg County Air Quality (MCAQ) and the NC-DAQ may become separate Primary Quality Assurance Organizations (PQAO) in 2015 or 2016. Currently MCAQ operates the collocated low-volume PM₁₀ monitor for the PQAO. If MCAQ and the NC-DAQ become separate PQAOs, the NC-DAQ will need a collocated low volume PM₁₀ monitor. As a result the NC-DAQ will add a collocated low volume PM₁₀ monitor at Millbrook starting January 1, 2015.

The locations of the current and rotating PM₁₀-monitoring sites are provided in Table 22 and Figure 47. All monitors listed in Table 22 are suitable for comparison to the NAAQS. All of the monitors meet the requirements of Appendices C and E of 40CFR58. Two of the monitors currently do not meet Appendix A requirements. The monitor at Millbrook (37-183-0014) and the monitor at the Durham Armory do not meet Appendix A requirements because they do not have an approved QA/SOP.

Table 23 provides the monitor type, operating schedules, monitoring objectives, scales and statement of purpose for all of the current and proposed monitors in the North Carolina PM₁₀ Monitoring Network. All of the monitors operate year-round. Table 24 summarizes the status for each current and proposed monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in Appendices A, C, D and E of 40CFR58 and also provides the proposed changes to the network.

Table 20 Ambient PM₁₀ Concentrations Measured in North Carolina

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^a	Year
370710016	Grier School	28	19 %	2013
371190003 ^{b, c}	Fire Station #11	54	36 %	2013
371190041 ^{b, d}	Garinger	40	27 %	2010
371190042 ^{b, d}	Montclair	57	38 %	2010
371191001 ^{b, c}	Davidson	39	26 %	2010
371191005 ^{b, c}	Arrowood	48	32 %	2010

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
371830014 ^e	Millbrook	55	37%	2010

Greensboro-High Point Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370810013 ^f	Mendenhall	63	42 %	2010

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370670022 ^{g, h}	Hattie Avenue	47	31 %	2010
370670023 ^{g, h}	Peter's Creek	49	33 %	2010

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370630015 ^d	Durham Armory	33	22 %	2011

Asheville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370891006 ^f	Allen Street	30	20 %	2009

Fayetteville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370510009 ^f	William Owen	51	34 %	2010

Hickory Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2008-2012		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370350004 ^f	Hickory	43	29 %	2010

Table 20 Ambient PM₁₀ Concentrations Measured in North Carolina

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Identification Number	Site Name	Highest 24-hr 1 st max for 2009-2013		
		Value (micrograms per cubic meter, standard conditions)	Percent of NAAQS ^b	Year
370330001 ^f	Cherry Grove	29	19 %	2013
370610002 ^f	Kenansville	30	20 %	2010
371110004 ^f	Marion	26	17 %	2011
371170001 ^f	Jamesville	35	23 %	2012
371290001 ^f	Candor	27	18 %	2011

^a The National Ambient Air Quality Standard for a 24-hour period is 150 micrograms per cubic meter. The standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter is equal to or less than one averaged over 3 years.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Monitor uses a high-volume SA/GMW-1200 (AQS Method Code 063), U.S. EPA reference method designation RFPS-1087-063

^d Monitor uses a low-volume Thermo R&P 2025 (AQS Method Code 127), U.S. EPA reference method designation RFPS-1298-127

^e Monitor used a Ruprecht & Patshneck TEOM Series 1400 (AQS Method Code 079), U.S. EPA equivalent method designation EQPM-1090-079 until 3/31/2009 when it was replaced with a low-volume Thermo R&P 2025 (AQS Method Code 127), U.S. EPA reference method designation RFPS-1298-127

^f Monitor uses a high-volume-Wedding-inlet (AQS Method Code 062), U.S. EPA reference method designation RFPS-1087-062

^g Monitor used a Ruprecht & Patshneck TEOM Series 1400 (AQS Method Code 079), U.S. EPA equivalent method designation EQPM-1090-079

^h Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

Table 21 Ambient Concentrations and Required Number of PM₁₀ Monitors for North Carolina Metropolitan Statistical Areas (MSA)

MSA	Population Estimate (2013) ^a	2013 PM ₁₀ 24-Hour Maximum Ambient Concentration As percent of NAAQS	Number of Monitors operated in North Carolina	
			Required ^b	Current
Charlotte-Concord-Gastonia	2,335,358	37	2-4	3
Virginia Beach-Norfolk-New Port News, VA-NC	1,707,369	19	2-4	0 ^c
Raleigh	1,214,516	25	2-4	1 ^d
Greensboro-High Point	741,065	19	1-2	1
Winston-Salem	650,820	19	1-2	1
Durham-Chapel Hill	534,578	20	1-2	1
Asheville	437,657	20 ^e	0-1	0
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	404,951	Not Available	0-1	0
Fayetteville	377,193	19	0-1	1
Hickory	363,572	19	0-1	1
Wilmington	268,601	10 ^f	0-1	0
Jacksonville	185,220	25 ^g	0	0
Greenville	174,263	Not Available	0	0
Burlington	154,378	Not Available	0	0
Rocky Mount	150,667	30 ^h	0	0
New Bern	127,657	Not Available	0	0
Goldsboro	124,583	21 ^g	0	0

^a Source: U.S. Census Bureau, Population Division, Released April 2012, available on the world wide web at <http://www.census.gov/popest/data/counties/totals/2011/index.html>

^b 40 CFR 58 Appendix D Table D-4

^c The Virginia Department of Environment operates 2 PM₁₀ monitors

^d The NC-DAQ received a waiver in 2008 for the second required PM₁₀ monitor

^e PM₁₀ 24-hour maximum ambient concentration is from 2009

^f Only 8 samples were collected from mid February to the end of March 2008.

^g PM₁₀ 24-hour maximum ambient concentration is from 2007

^h PM₁₀ 24-hour maximum ambient concentration is from 2006

Table 22 North Carolina PM₁₀ Monitoring Network – Monitor Locations

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370710016	Grier Middle School	1622 East Garrison Blvd.	Gastonia	-81.153333	35.253056	Charlotte-Concord-Gastonia
371190003 ^a	#11 Fire Station	Fire Station #11, 620 Moretz Avenue	Charlotte	-80.824717	35.251717	Charlotte-Concord-Gastonia
371190041 ^a	Garinger	1130 Eastway Drive	Charlotte	-80.785683	35.240100	Charlotte-Concord-Gastonia
371190042 ^{a, b}	Montclaire	1935 Emerywood Drive	Charlotte	-80.866983	35.151283	Charlotte-Concord-Gastonia

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	-78.574167	35.856111	Raleigh

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370810013	Mendenhall	205 Willoughby Blvd.	Greensboro	-79.810456	36.100711	Greensboro-High Point

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370670022 ^e	Hattie Avenue	Corner of 13 th & Hattie Avenue	Winston-Salem	36.110556	-80.226667	Winston-Salem

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370630015 ^d	Durham Armory	801 Stadium Drive	Durham	-78.905417	36.032944	Durham-Chapel Hill

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370510009	William Owens	4533 Raeford Road	Fayetteville	-78.953112	35.041416	Fayetteville

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
37-003-0005	Taylorsville -Liledoun	700 Liledoun Road	Taylorsville	-81.191	35.9139,	Hickory
370350004 ^f	Hickory Water Tower	1650 1st Street	Hickory	-81.365556	35.728889	Hickory

Not in a Metropolitan Statistical Area Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370330001 ^c	Cherry Grove	7074 Cherry Grove Road	Reidsville	-79.467417	36.307033	None
370610002 ^c	Kenansville	328 Limestone Road	Kenansville	-77.960781	34.954823	None
371110004 ^c	East Marion	700 State Street	Marion	-81.993889	35.687500	None
371170001 ^c	Jamesville	33215 US Highway 64	Jamesville	-76.897820	35.810690	None
371230001 ^c	Candor	112 Perry Drive	Candor	-79.836613	35.262490	None

^a Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

Table 22 North Carolina PM₁₀ Monitoring Network – Monitor Locations

^b This site has a collocated low volume PM₁₀ monitor.

^c One of six background PM₁₀ monitors that operates for one year every three years.

^d Monitor started in 2011 to meet minimum PM₁₀ monitoring requirements in the Durham-Chapel Hill MSA.

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^f This site has a collocated high volume PM₁₀ monitor.

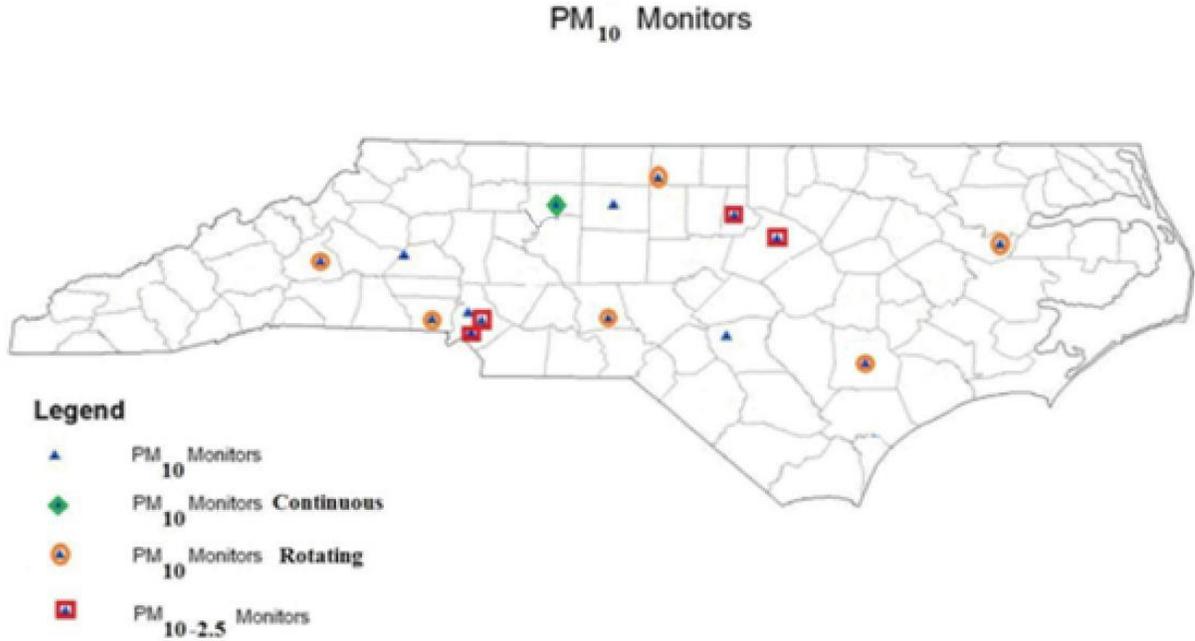


Figure 47. PM 10 Monitor Locations

Table 23 Statement of Purpose for North Carolina PM₁₀ Monitoring Network

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370710016	Grier Middle School	SPECIAL PURPOSE	24-hour, midnight to midnight, 1 in 6 day ^c	Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood
371190003 ^a	#11 Fire Station	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Highest Concentration/Population Exposure	Neighborhood
371190041 ^a	Garinger	SLAMS	24-hour, midnight to midnight, 1 in 3 day	Required by Appendix D for NCore sites in 2011. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood
371190042 ^{a, b}	Montclaire	SLAMS	24-hour, midnight to midnight, 1 in 3 day	Required by Appendix D. Collocated low volume PM10 site required by Appendix A. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	SLAMS	24-hour, midnight to midnight, 1 in 3 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370810013	Mendenhall	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure/General/Background	Neighborhood/Urban

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370670022 ^d	Hattie Avenue	SLAMS	Hourly	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370630015 ^c	Durham Armory	SLAMS	24-hour, midnight to midnight, 1 in 3 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Neighborhood

Table 23 Statement of Purpose for North Carolina PM₁₀ Monitoring Network

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370510009	William Owens	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	Population Exposure	Urban

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
37-003-0005	Taylorville -Liledoun	SPECIAL PURPOSE	24-hour, midnight to midnight, 1 in 6 day ^c	Industrial expansion monitoring for PSD modeling.	General/Background	Urban
370350004 ^e	Hickory Water Tower	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Required by Appendix D. Compliance w/NAAQS. Industrial expansion monitoring for PSD modeling.	General/Background	Neighborhood

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370330001	Cherry Grove	Special Purpose	24-hour, midnight to midnight, 1 in 6 day	Industrial expansion monitoring for PSD modeling for northern piedmont areas	Population Exposure General/Background	Urban
370610002	Kenansville	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Industrial expansion monitoring for PSD modeling for coastal areas	Population Exposure General/Background	Neighborhood
371110004	East Marion	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Industrial expansion monitoring for PSD modeling for foothill areas	Population Exposure	Neighborhood
371170001	Jamesville	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Industrial expansion monitoring for PSD modeling for northern coastal areas	General/Background	Regional
371230001	Candor	SLAMS	24-hour, midnight to midnight, 1 in 6 day	Industrial expansion monitoring for PSD modeling for sand hill areas	Population Exposure General/Background	Regional

^a Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^b This site has a collocated low volume PM₁₀ monitor.

^c Monitor started January 1, 2011.

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^e This site has a collocated high volume PM₁₀ monitor

Table 24 Status of North Carolina PM₁₀ Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
370710016	Grier Middle School	Yes	Yes: RFPS-1087-062	No	Site will shut down 12/31/2014
371190003 ^c	#11 Fire Station	Yes	Yes: RFPS-1287-063	Yes	None
371190041 ^c	Garinger	Yes	Yes: RFPS-1298-127	Yes	None
371190042 ^c	Montclair	Yes	Yes: RFPS-1298-127	Yes	None

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^d			Proposal to Move or Change
		A	C	D	
371830014	Millbrook	No	Yes: RFPS-1298-127	Yes	Add a collocated PM10 monitor

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^e			Proposal to Move or Change
		A	C	D	
370810013	Mendenhall	Yes	Yes: RFPS-1087-062	Yes	May change monitoring method in 2014

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Meets Requirements of Part 58 Appendices ^f			Proposal to Move or Change
		A	C	D	
370670022	Hattie Avenue	Yes	Yes: EQPM-1090-079	Yes	None

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^d			Proposal to Move or Change
		A	C	D	
370630015	Durham Armory	No	Yes: RFPS-1298-127	Yes	Monitoring method will change in 2014

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^e			Proposal to Move or Change
		A	C	D	
370510009	William Owens	Yes	Yes: RFPS-1087-062	Yes	Add a collocated PM10 monitor

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^e			Proposal to Move or Change
		A	C	D	
370030005	Taylorville - Liledoun	Yes	Yes: RFPS-1087-062	Yes	Operates every third year (3/2015 to 2/2016)
370350004	Hickory Water Tower	Yes	Yes: RFPS-1087-062	Yes	Monitor will shut down 12/31/2014

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^e			Proposal to Move or Change
		A	C	D	
370330001	Cherry Grove	Yes	Yes: RFPS-1087-062	Not Required	Operates every third year (4/2016 to 3/2017)
370610002	Kenansville	Yes	Yes: RFPS-1087-062	Not Required	Operates every third year (8/2013-8/2014)
371110004	East Marion	Yes	Yes: RFPS-1087-062	Not Required	Operates every third year (2/2014 to 1/2015)
371170001	Jamesville	Yes	Yes: RFPS-1087-062	Not Required	Operates every third year (3/2015 to 2/2016)
371230001	Candor	Yes	Yes: RFPS-1087-062	Not Required	Operates every third year (2/2014 to 1/2015)

Table 24 Status of North Carolina PM₁₀ Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network^a

^a All monitors provide data that are suitable for comparing to the NAAQS.

^b All monitors meet the requirements of Appendix E of 40CFR58.

^c Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d The Quality Assurance Project Plan and Standard Operating Procedures are being written for the low volume PM₁₀ monitor operated by the NC-DAQ. The monitor meets the requirements of Appendix E of 40CFR58.

^e The Quality Assurance Project Plan and Standard Operating Procedures are being revised to reflect changes made to the monitoring regulations in 2006. All monitors meet the requirements of Appendix E of 40 CFR 58.

^f Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

VII. Fine Particle (PM_{2.5}) Monitoring Network

This section is divided into three subsections. The first discusses the network of Federal Reference Method (FRM) and Federal Equivalent Method (FEM) fine particle monitors that are used to determine compliance with the National Ambient Air Quality Standards (NAAQS). The second section discusses the continuous fine particle monitors that are used for air quality forecasting, real-time reporting and air quality index reporting. Three of these monitors are FEMs that are also part of the FRM/FEM network. The third section discusses the fine particle manual speciation monitors.

A. *The Federal Reference Method and Federal Equivalent Method Network*

The North Carolina Division of Air Quality (NC-DAQ) currently operates 27 Federal Reference Method (FRM) or Federal Equivalent Method (FEM) fine particle monitoring sites and the local programs operate six. The monitors at these sites have been approved by the United States Environmental Protection Agency (EPA) and can be used to determine compliance with the National Ambient Air Quality Standards (NAAQS). This strong network has greatly benefited the state by enabling the NC-DAQ to learn how fine particles are transported to and within the state, to identify the parts of the state with the highest concentrations of fine particles and to know where fine particle concentrations do and do not exceed the NAAQS.

Table 25 provides the highest fine particle design values for the monitors in North Carolina for the past five years. This information is important because the monitoring regulations promulgated by the U.S. EPA in 2006 require a monitor to be attaining the NAAQS for the past five years before the monitor can be shut down (40CFR58.14(c)(1)). A total of 26 of the currently operating FRM/FEM monitors, listed in Table 26, meet this requirement. However, as indicated in Table 26, 40CFR58 Appendix D 4.7 requires 10 of these 26 monitors. The other 16 of these monitors, as indicated in Table 26, meet the additional requirement of having less than 10 percent probability of exceeding 80 percent of the NAAQS during the next three years (40CFR58.14(c)(1)). Thus, there are 16 monitors, four operated by local programs and 12 operated by the NC-DAQ, that are not required by Appendix D that meet all of the requirements of 40CFR58.14(c)(1) to be shut down. The Western North Carolina Regional Air Quality Agency decided to shut down the monitor and co-located monitor at the Board of Education site (37-021-0034). The NC-DAQ reviewed the 12 monitors operated by the NC-DAQ and their current monitoring objectives and decided to shut down six of these monitors at the end of 2014: 37-001-0002 on Hopedale Road in Burlington, 37-037-0004 in Pittsboro, 37-071-0016 at Grier School in Gastonia, 37-083-0014 in Colfax, 37-155-0005 on Linkhaw Road in Lumberton and 37-191-0005 at Dillard School in Goldsboro. The design values for the last six years for these six monitors are graphed in Figure 48. Figure 49 through Figure 60 show time series and correlations of these six monitors with other nearby monitors.

Table 25 Fine Particle Concentrations Measured by the North Carolina Fine Particle Monitoring Network in the Last Five Years (2009-2013) ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370710016	Grier Middle School	24	69 %	2007-2009	12.0	100 %	2007-2009
371190041 ^b	Garinger	26	74 %	2007-2009	12.2	102 %	2007-2009
371190042 ^b	Montclair	24	69 %	2007-2009	12.6	105 %	2007-2009
371190043 ^b	Oakdale	25	71 %	2007-2009	12.0	100 %	2007-2009
371590021	Rockwell	24	69 %	2007-2009	12.3	103 %	2007-2009

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
37101000	West Johnston	20	57 %	2010-2012	9.3	78 %	2008-2010
371830014	Millbrook	26	74 %	2007-2009	11.2	93 %	2007-2009
371830020	Finley Farm	21	60 %	2009-2011	10.2	85 %	2007-2009

Greensboro-High Point Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370810013	Mendenhall	24	69 %	2007-2009	11.3	94 %	2007-2009
370810014	Colfax	23	66 %	2007-2009	11.0	92 %	2007-2009

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370570002	Lexington Water Tower	25	71 %	2007-2009	13	108 %	2007-2009
370670022 ^c	Hattie Ave.	25	71 %	2007-2009	11.8	98 %	2007-2009
370670030 ^c	Clemmons School	26	74 %	2007-2009	11.7	98 %	2007-2009

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370370004	Pittsboro	22	63 %	2007-2009	10.2	85 %	2007-2009
370630001	Durham Health	30	86 %	2007-2009	12.9	108 %	2007-2009
370630015	Durham Armory	22	63 %	2007-2009	11.1	93 %	2007-2009
371350007	HR	26	74 %	2007-2009	12.3	103 %	2007-2009

Asheville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370210034 ^d	Board of Ed	23	66 %	2007-2009	9.9	83 %	2007-2009
370870010	Waynesville Fire Station	27	77 %	2007-2009	12.6	105 %	2007-2009
370870012	Waynesville Recreation	23	66 %	2008-2010	10.6	88 %	2008-2010

Table 25 Fine Particle Concentrations Measured by the North Carolina Fine Particle Monitoring Network in the Last Five Years (2009-2013) ^a

Fayetteville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370510009	William Owen	24	69 %	2007-2009	11.7	98 %	2007-2009

Hickory Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370350004	Hickory Water Tower	26	74 %	2007-2009	12.5	104 %	2007-2009

Wilmington Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
371290002	Castle Hayne	26	74 %	2009-2011	8.7	73.0 %	2007-2009

Jacksonville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
371330005	Northwoods	22	63 %	2007-2009	9.5	79 %	2007-2009

Greenville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
371470005	Greenville South	19	54 %	2007-2009	10.4	87 %	2007-2009
371470006	Pitt Co Ag Center	22	63 %	2010-2012	9.9	83 %	2007-2009

Burlington Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370010002	Hopedale	25	71 %	2007-2009	11.6	97 %	2007-2009

Rocky Mount Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
370650004	Springfield Rd	22	63 %	2007-2009	10.4	87 %	2007-2009

Goldsboro Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year	Value ($\mu\text{g}/\text{m}^3$)	% of NAAQS	Year
371910005	Dillard	23	66 %	2007-2009	11.1	93 %	2007-2009

Table 25 Fine Particle Concentrations Measured by the North Carolina Fine Particle Monitoring Network in the Last Five Years (2009-2013) ^a

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Identification Number	Site Name	Highest 24-hr design value			Highest annual design value		
		Value (µg/m ³)	% of NAAQS	Year	Value (µg/m ³)	% of NAAQS	Year
370330001	Cherry Grove	23	66 %	2007-2009	10.7	89 %	2007-2009
370610002	Kenansville	21	60 %	2007-2009	9.6	80 %	2007-2009
371070004	Lenoir Community College	22	63 %	2010-2012	9.7	81 %	2007-2009
371110004	East Marion	24	69 %	2007-2009	11.5	96 %	2007-2009
371170001	Jamesville	24	69 %	2010-2012	9.5	79 %	2007-2009
371210001	Spruce Pine	23	66 %	2007-2009	10.8	90 %	2007-2009
371230001	Candor	22	63 %	2007-2009	10.6	88 %	2007-2009
371550005	Linkhaw	24	69 %	2007-2009	11.2	93 %	2007-2009
371730002	Bryson City	23	66 %	2007-2009	11.0	92 %	2007-2009
371890003	Boone	21	60 %	2007-2009	9.6	80 %	2007-2009

^a All monitors use an R & P Model 2025 PM2.5 Sequential Monitor with a WINS impactor (Air Quality System (AQS) Method Code 118, U.S. EPA reference method designation RFPS-0498-118) except the Bryson and Millbrook monitors which started using a Met One BAM-1020 Monitor in 2011 (AQS Method Code 170). All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^d Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

Table 26 Fine Particle Monitors that Have Demonstrated Attainment of the National Ambient Air Quality Standards for the Past Five Years

Charlotte-Concord-Gastonia Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-071-0016	Grier Middle School	Gaston	No	Yes
37-119-0042	Oakdale	Mecklenburg	No	Yes
Raleigh Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-101-0002	West Johnston	Johnston	Yes – 1 of 2 required monitors for the Raleigh Cary MSA	Yes
37-183-0014	Millbrook	Wake	Yes – 1 of 2 required monitors for the Raleigh Cary MSA	No
Greensboro-High Point Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-081-0013	Mendenhall	Guilford	Yes –for the Greensboro-High Point MSA	Yes
37-081-0014	Colfax	Guilford	Not at this time	Yes
Winston-Salem Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-067-0022	Hattie Avenue	Forsyth	No	Yes
37-0670030	Clemmons School	Forsyth	No	Yes
Durham-Chapel Hill Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-037-0004	Pittsboro	Chatham	No	Yes
37-063-0015	Durham Armory	Durham	Yes – for the Durham-Chapel Hill MSA	Yes
Asheville Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-021-0034 ^b	Board of Ed	Buncombe	No –	Yes
370870012	Waynesville Recreation	Haywood	No – design value monitor for the Asheville MSA	Yes
Fayetteville Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-051-0009	William Owen	Cumberland	No	Yes
Wilmington Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-129-0002	Castle Hayne	New Hanover	No	Yes
Greenville Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-147-0006	Pitt Co Ag Center	Pitt	No	Yes
Burlington Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-001-0002	Hopedale	Alamance	No	Yes

Table 26 Fine Particle Monitors that Have Demonstrated Attainment of the National Ambient Air Quality Standards for the Past Five Years

Goldsboro Metropolitan Statistical Area				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-191-0005	Dillard	Wayne	No	Yes
Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites				
Site Code	Site Name	County	Required by 40 CFR 58 Appendix D?	< 10% probability of exceeding 80% of NAAQS in next 3 years?
37-033-0001	Cherry Grove	Caswell	Yes - regional transport monitor for the piedmont part of the state	Yes
37-061-0002	Kenansville	Duplin	Yes - general/ background monitor for the coastal part of the state	Yes
37-111-0004	East Marion	McDowell	No	Yes
37-117-0001	Jamesville	Martin	Yes - regional transport monitor for the coastal part of the state	Yes
37-121-0001	Spruce Pine	Mitchell	No	Yes
37-123-0001	Candor	Montgomery	Yes - general/ background monitor for the central piedmont area of the state	Yes
37-155-0005	Linkhaw	Robeson	No	Yes
37-173-0002	Bryson City	Swain	Yes – background and regional transport monitor for the mountains	Yes
37-189-0003	Boone	Watauga	Yes – background and regional transport monitor for the mountains	Yes

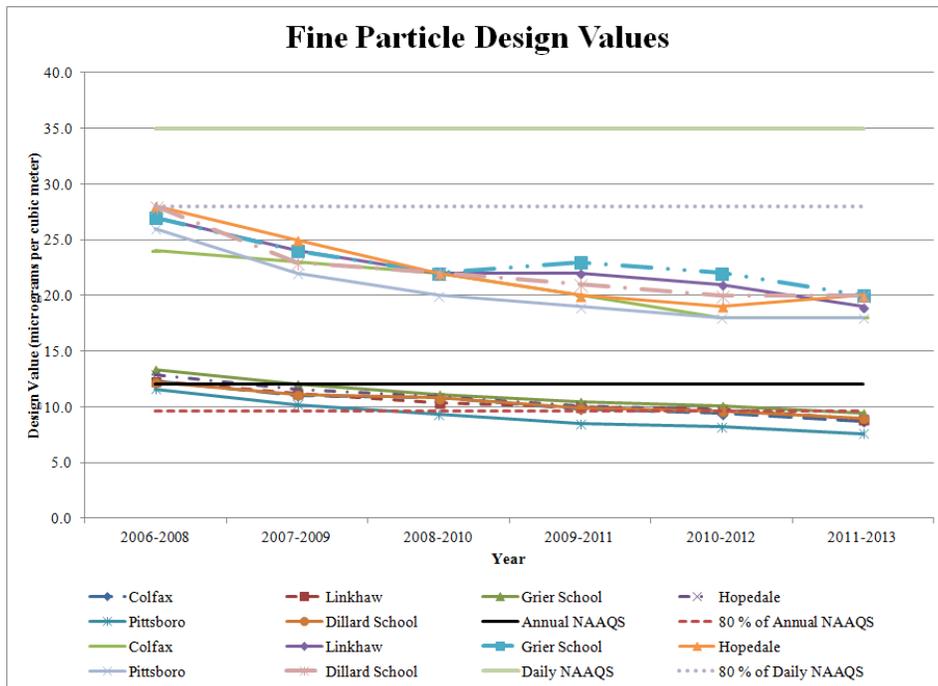


Figure 48. Historical Design Values for Sites Proposed to be Shut Down

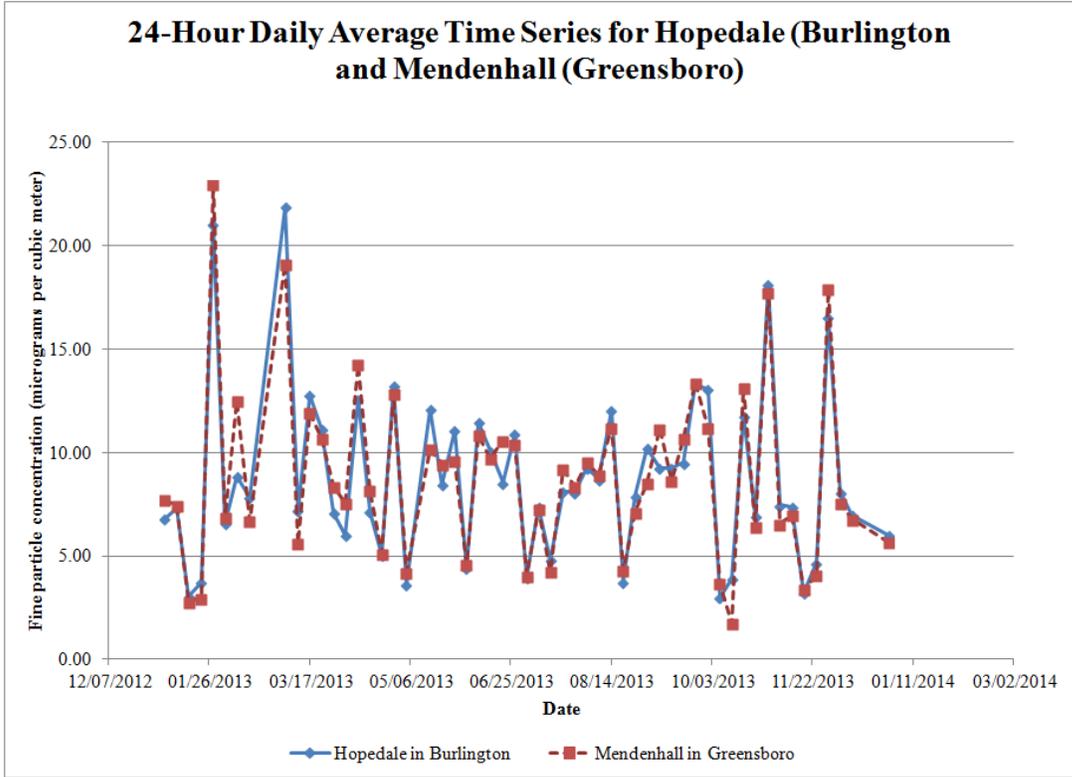


Figure 49. Average 24-Hour Fine Particle Concentrations at Burlington and Greensboro

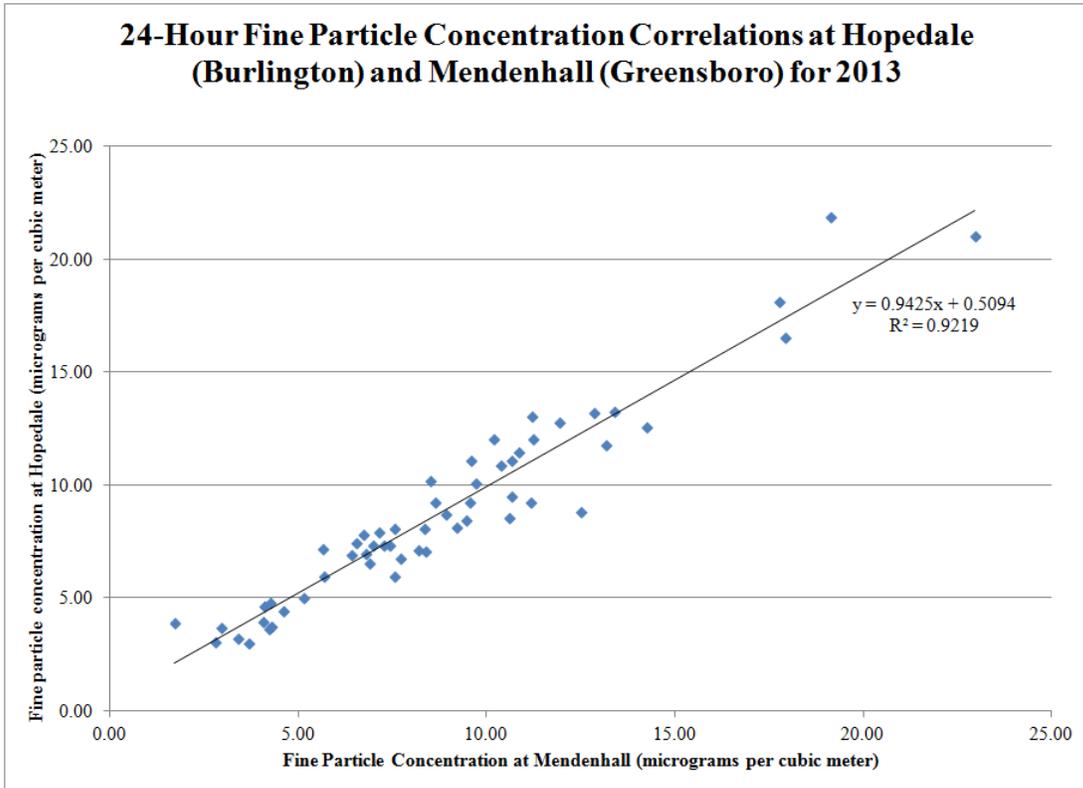


Figure 50. 24-Hour Fine Particle Correlation for the Burlington and Greensboro Monitors

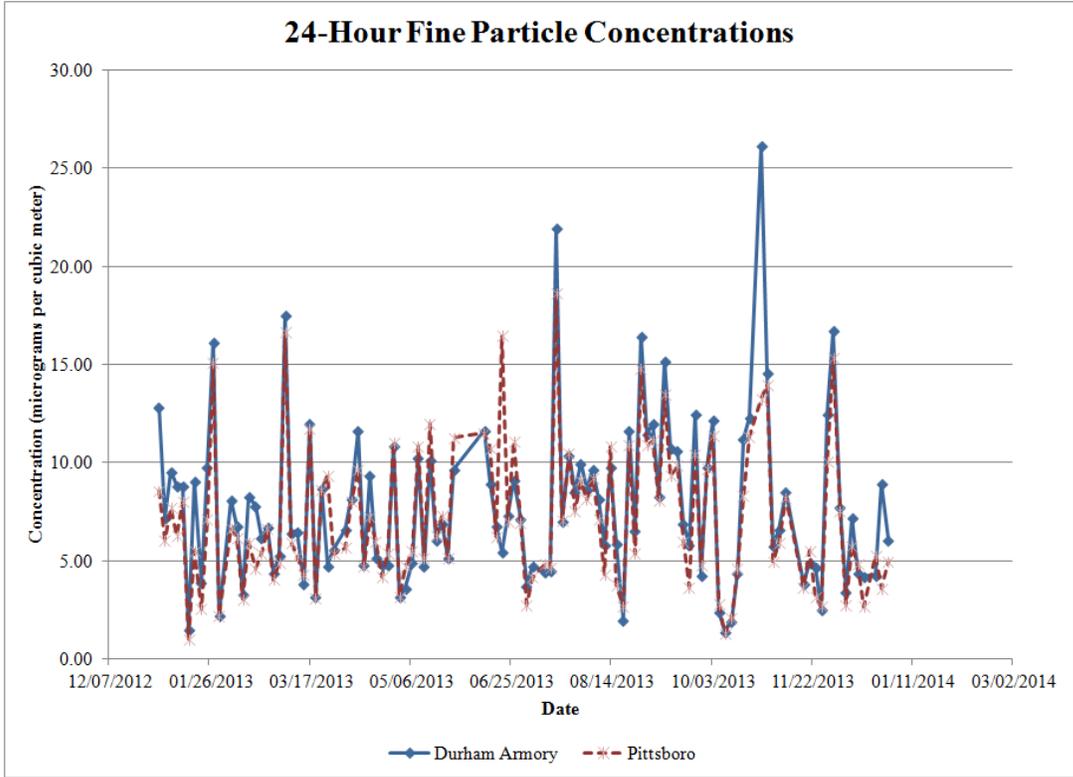


Figure 51. 24-Hour Fine Particle Concentrations at the Durham Armory and Pittsboro

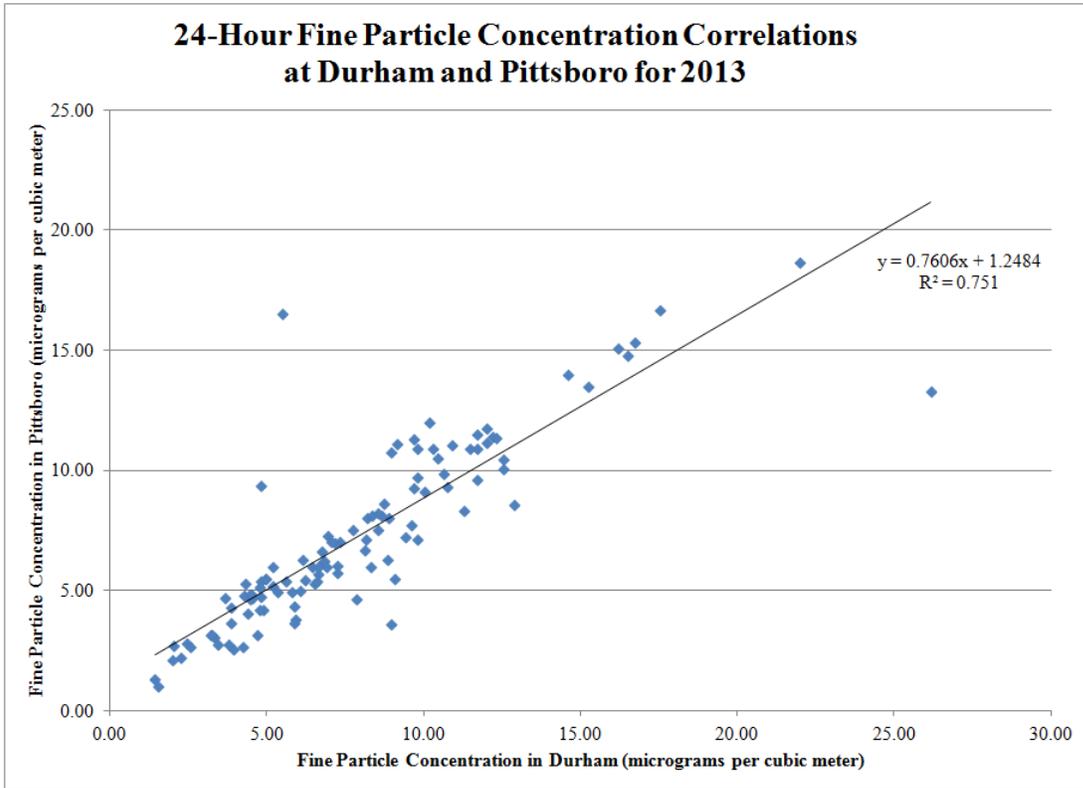


Figure 52. Correlation of 2013 Fine Particle Concentrations at Pittsboro and the Durham Armory

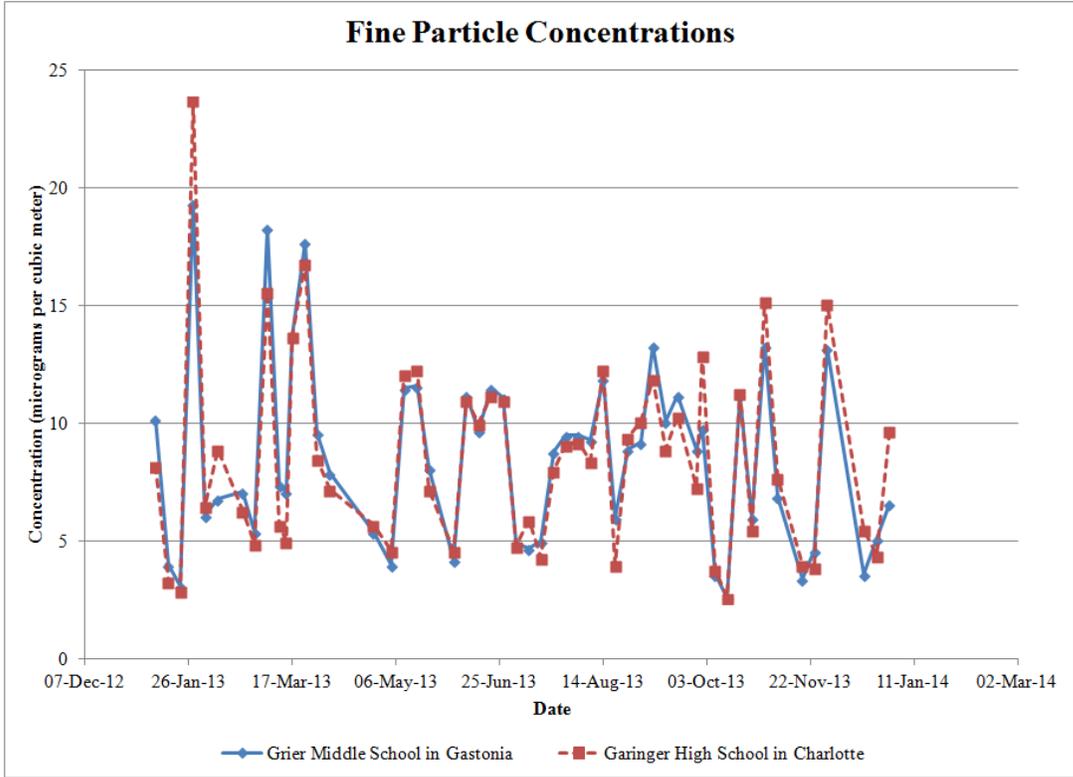


Figure 53. 24-Hour Daily Fine Particle Concentrations at Grier Middle and Garinger High Schools

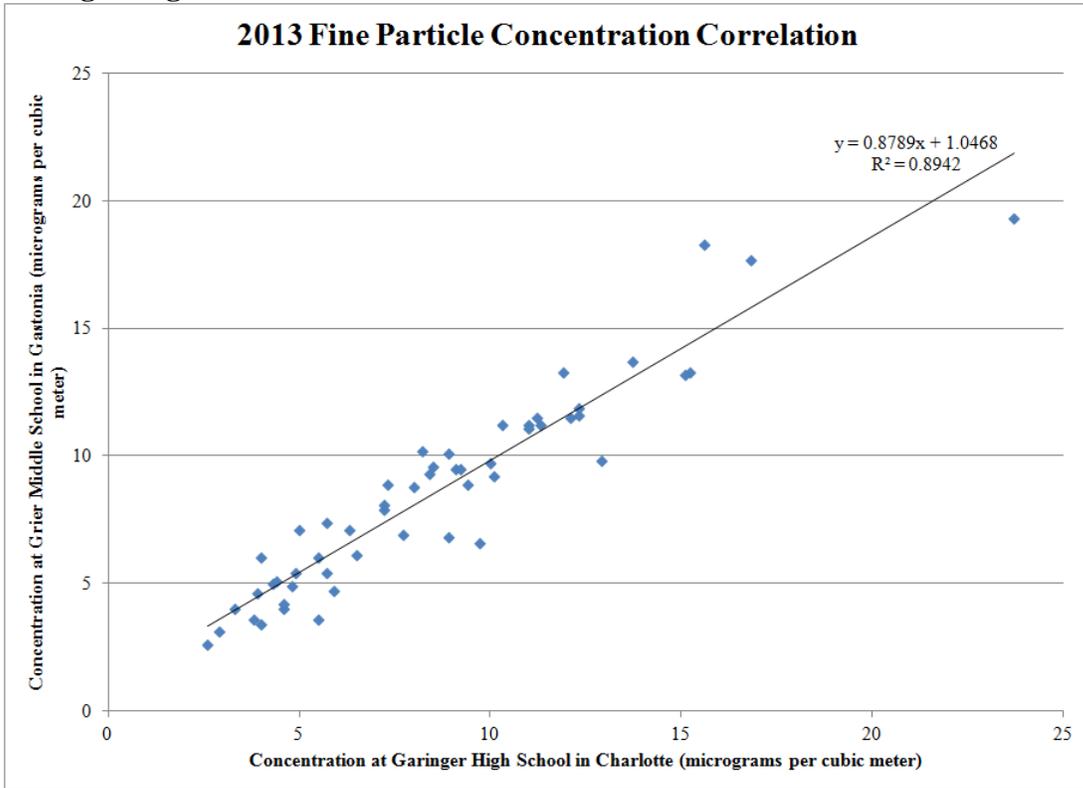


Figure 54. Correlation of 24-Hour Fine Particle Concentrations at Grier Middle and Garinger High Schools

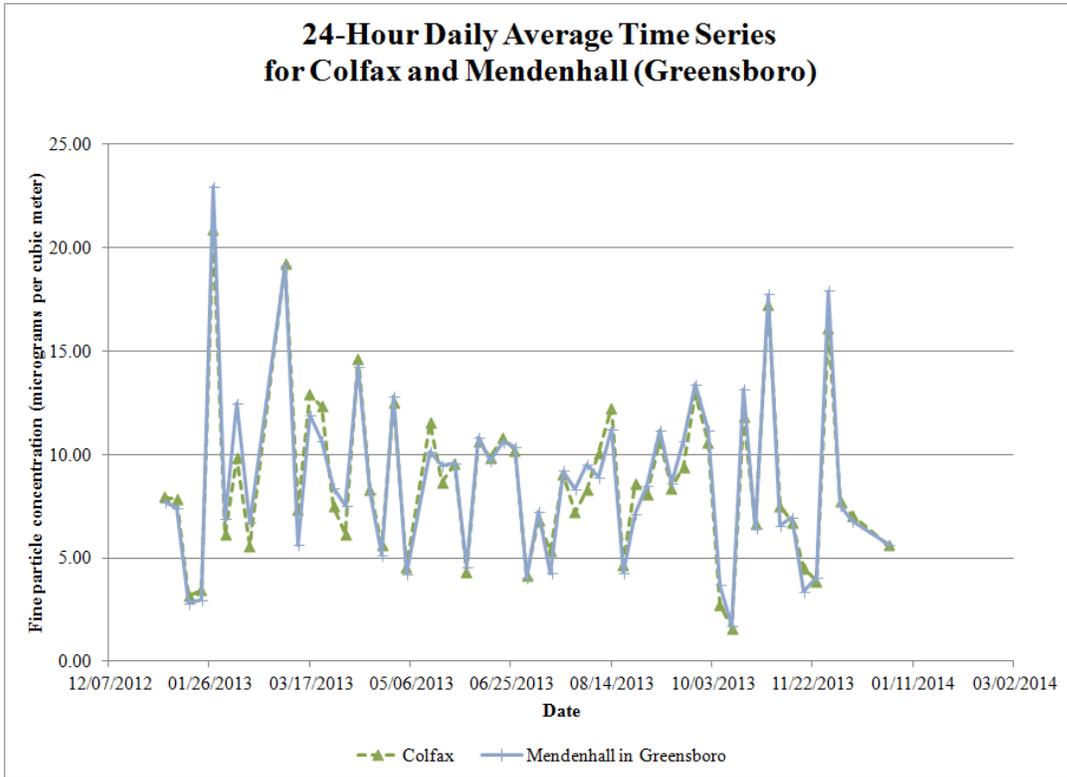


Figure 55. 2013 Daily Fine Particle Concentrations at Colfax and Mendenhall

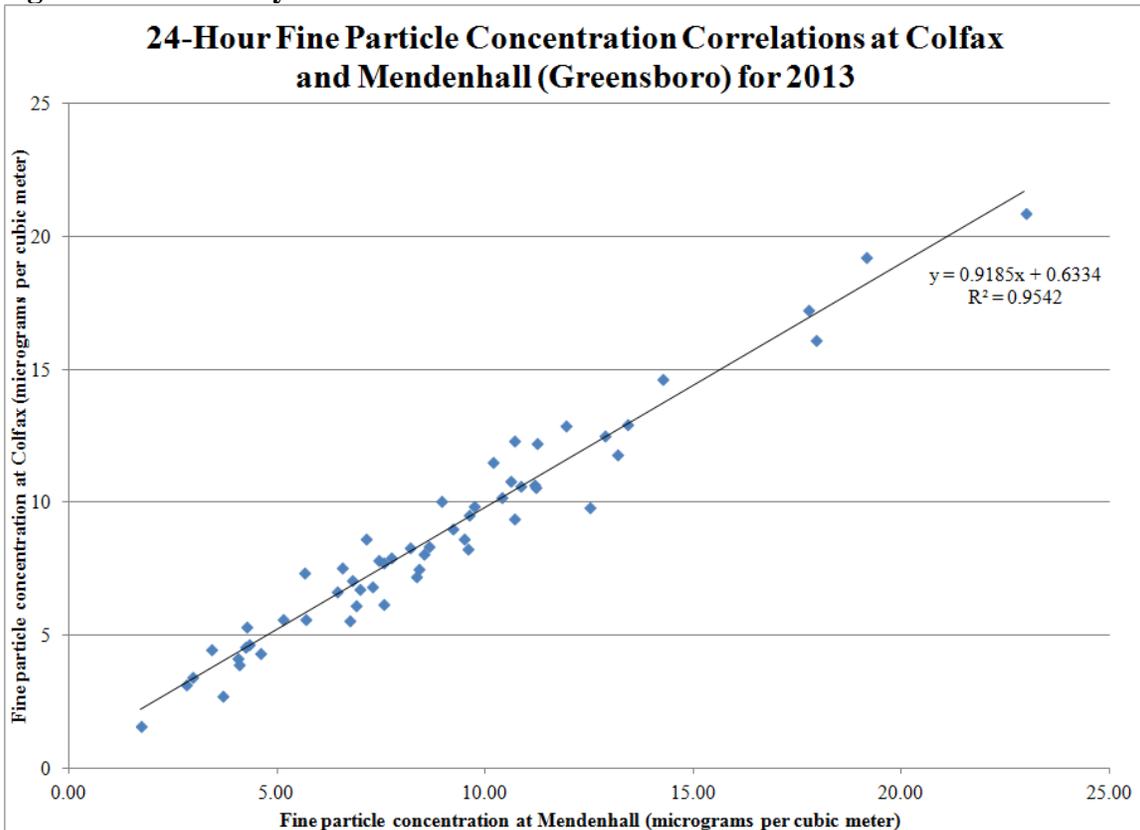


Figure 56. Correlation of the Colfax and Mendenhall Monitors in 2013

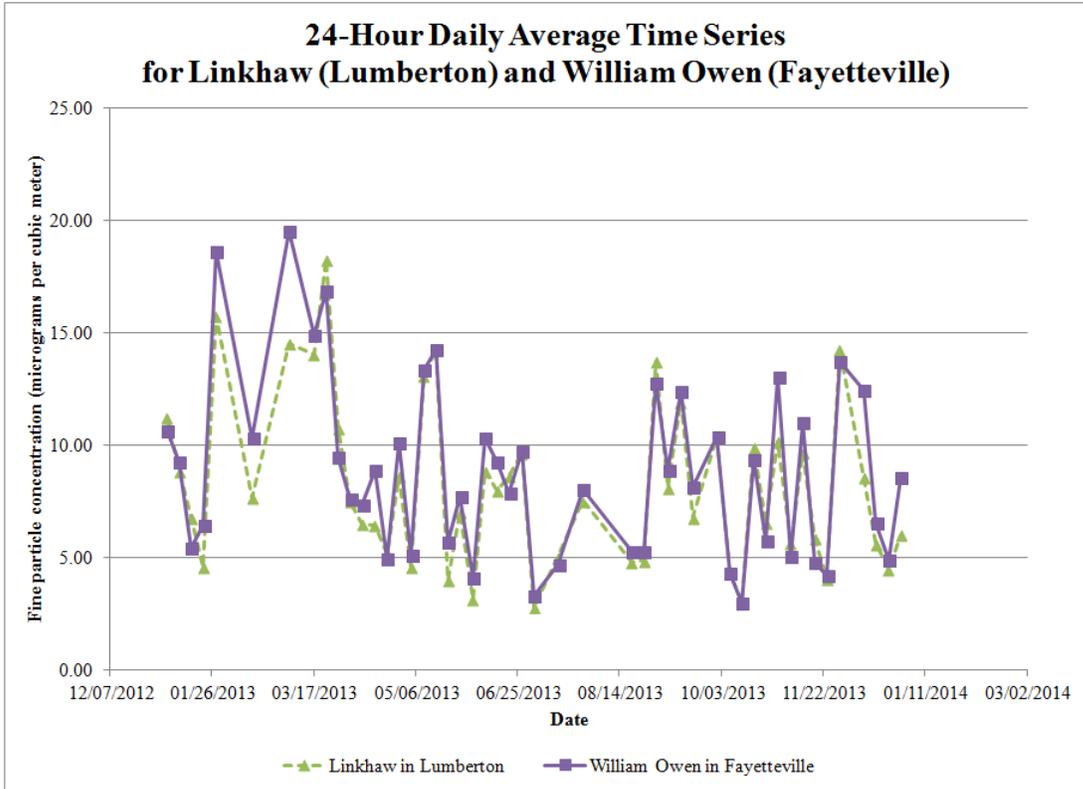


Figure 57. 2013 Daily Fine Particle Concentrations at Lumberton and Fayetteville

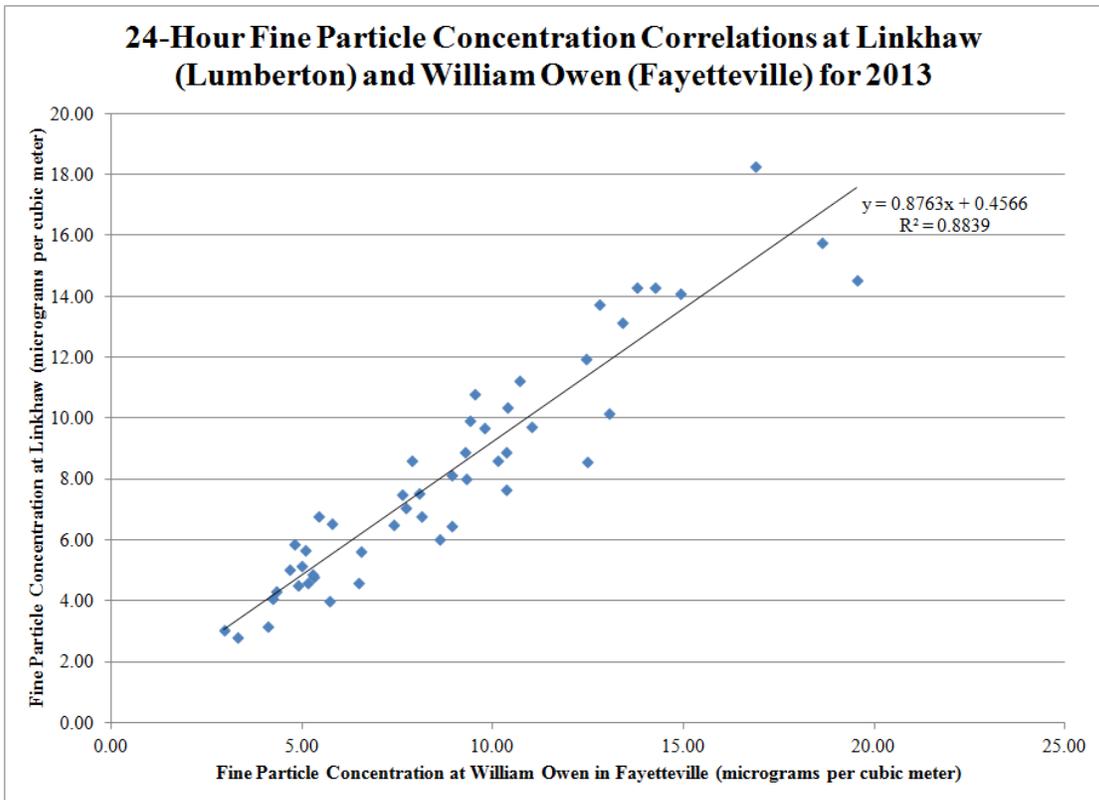


Figure 58. Daily Fine Particle Concentration Correlations at Lumberton and Fayetteville

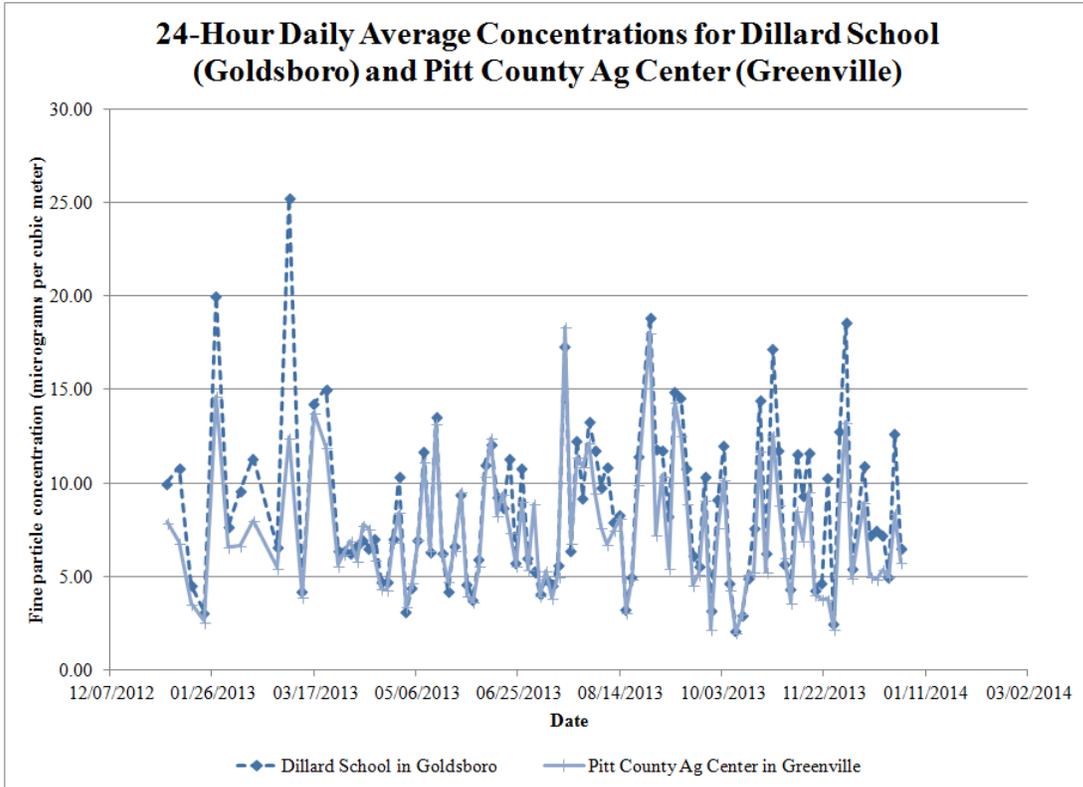


Figure 59. Fine Particle Concentrations at Goldsboro and Greenville in 2013

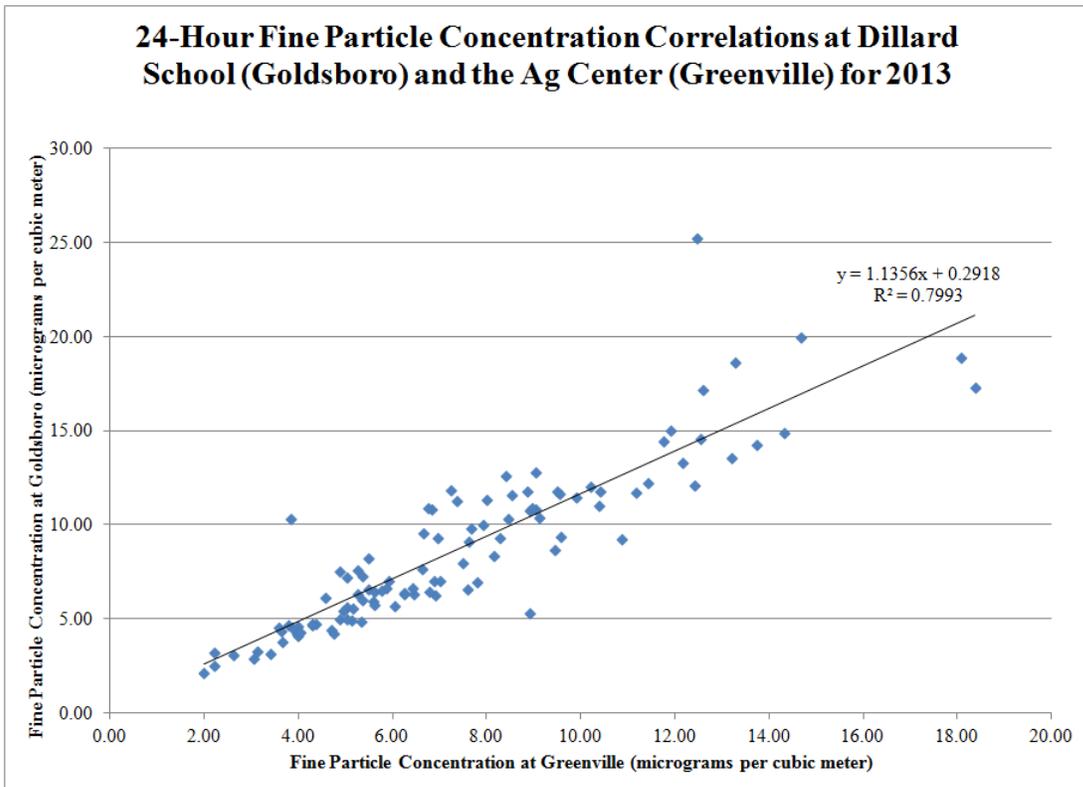


Figure 60. Correlation of Fine Particle Concentrations between Goldsboro and Greenville

The NC-DAQ decided to shut down these six monitors for several reasons. First, the NC-DAQ anticipates that in the near future the EPA Region 4 will significantly reduce the amount of funding the NC-DAQ receives via the 103 Grant to pay for the fine particle monitoring network. Significant reductions in funding will require a significant reduction in the monitoring network. Shutting down these monitors also frees up resources to do other required monitoring that is anticipated to support the source-oriented sulfur dioxide monitoring requirements as well as near-road monitoring requirements. Also, as shown in Figure 49 through Figure 60 the fine particle concentrations measured by these monitors track well and are correlated with the fine particle concentrations measured by other nearby monitors. Thus, the fine particle concentrations measured by these monitors can be represented by the concentrations measured by nearby monitors. Because of the extensive fine particle network operated by the state, shutting down these six fine particle monitors still allows adequate baseline monitoring coverage throughout the piedmont and eastern part of the state for modeling purposes for prevention of significant deterioration applications.

The NC-DAQ decided to continue operating the other six monitors for the following reasons:

- The Waynesville (37-087-0012) monitor is located in the same valley as Blue Ridge Paper, a major source in the Asheville area. It ensures that the air quality is being protected in the Waynesville area and that the permit conditions for Blue Ridge Paper are adequate.
- The William Owen (37-051-0009) monitor is needed to maintain an adequate spatial coverage for the fine particle monitoring network. Without it, there would be a hole in coverage for the south central part of the state. The data from this monitor is also used in the permit process for PSD modeling. In addition, the Fayetteville MSA is in one of the fastest growing areas of the state. Hoke County, one of two counties in the MSA, is the 32nd fastest growing county in the nation.
- The Castle Hayne (37-129-0002) monitor is in an area where there is a great deal of interest in the air quality because of Titan Cement's plans to build a concrete facility across the road from the monitor. The NC-DAQ believes it is important to maintain a design value monitor at this location.
- The Pitt County Agricultural Center (37-147-0006) monitor is located in Greenville, one of the largest urban areas in northern coastal North Carolina. Having a fine particle monitor here is important when there are wildfires in the area. Eventually, the NC-DAQ may extend air quality forecasting to the area.
- The East Marion (37-111-0004) monitor fills a gap in the area of elevation change as it is the monitor between the piedmont and the mountains.
- The Spruce Pine (37-121-0001) monitor is located in a mining community and ensures that air quality is maintained during mining operations. When people complain the data from the monitor is useful to demonstrate that the air is safe to breathe.

The reasons for continued operation of these monitors are consistent with the Federal guidelines in 40 CFR 58 Appendix D 1.1.1, which states, "...a network must be designed with a variety of types of monitoring sites. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region and air pollution levels near specific sources." These monitors are necessary for the staff of the NC-DAQ to make informed decisions and provide air quality information to the public to ensure public health and welfare.

Other fine particle monitors that could be considered for shut down are those monitors that exceed the minimum number of monitors required in 40CFR58 Appendix D Table D-5 provided in Figure 61. The latest estimated population of the Metropolitan Statistical Area (MSA) and the most recent fine particle 24-hour and annual design value for the area determines the number of required monitors for an area. Table 27 provides the 2013 population estimates for the MSAs in North Carolina, the preliminary design values for 2011-2013, the number of required monitors based on Appendix D and the number of current monitors operated by the NC-DAQ and the local programs. Currently, the NC-DAQ and the local programs are operating at least the minimum number of required monitors in every MSA except for the Virginia Beach-Norfolk-New Port News MSA. The NC-DAQ has a written agreement with the Virginia Department of Environmental Quality (VDEQ), Office of Air Quality Monitoring, that VDEQ will maintain the minimum required number of monitors for the Virginia Beach-Norfolk-New Port News MSA. In 2013 the annual and daily fine particle design values in North Carolina continued to decline, reducing the number of required monitors in MSAs throughout the state.

TABLE D-5 OF APPENDIX D TO PART 58. PM_{2.5} MINIMUM MONITORING REQUIREMENTS

MSA population ^{1,2}	Most recent 3-year design value ≥85% of any PM _{2.5} NAAQS ³	Most recent 3-year design value <85% of any PM _{2.5} NAAQS ^{3,4}
>1,000,000	3	2
500,000–1,000,000	2	1
50,000–<500,000 ⁵	1	0

¹ Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

² Population based on latest available census figures.

³ The PM_{2.5} National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

⁴ These minimum monitoring requirements apply in the absence of a design value.

⁵ Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Figure 61. 40CFR58 Appendix D Table D-5

The NC-DAQ evaluated each MSA with more than the required monitors to determine if all of the current monitors in the MSA are still needed and providing valuable information. One monitor was considered in this evaluation (the local program monitors were not included in this analysis):

- The Rockwell (37-159-0021) monitor because it is part of the Charlotte-Concord-Gastonia MSA, the MSA has more than the minimum number of monitors required and the Rockwell monitor is not the design value monitor for the MSA. The NC-DAQ evaluated the Rockwell monitor and decided to continue operating it because it provides valuable information on the fine particle concentrations leaving the Charlotte-Concord-Gastonia MSA and entering the Winston-Salem and Greensboro-High Point MSAs. Its data is also used in the permit process for PSD modeling. The reasons for continued operation of this monitor are consistent with the Federal guidelines in 40 CFR 58 Appendix D 1.1.1. This monitor is necessary for the staff of the NC-DAQ to make informed decisions with regard to development of state implementation plans and permits for facilities and to provide air quality information to the public to ensure public health and welfare.

The locations of the current FRM/FEM fine particle-monitoring sites are provided in Table 28. All monitors listed in Table 28 are suitable for comparison to the National Ambient Air Quality Standards (NAAQS). All of the monitors meet the requirements of Appendices A, C, D and E of 40CFR58. All of these monitors except the monitors at Bryson (37-173-0002), Cherry Grove (37-033-0001) and Millbrook (37-183-0014) use the U.S. EPA reference method designation RFPS-0498-118. The monitors at Bryson, Cherry Grove and Millbrook use the U.S. EPA Automated Equivalent Method: EQPM-0308-170. Figure 62 shows the locations of the currently operating monitors.

Table 29 provides the monitor type, operating schedules, monitoring objectives, scales and statement of purpose for all of the current and proposed monitors in the North Carolina Fine Particle Monitoring Network. All monitors except the Millbrook, Cherry Grove and Bryson monitors operate on a 24-hour schedule from midnight to midnight on each scheduled sampling day. The Millbrook, Cherry Grove and Bryson monitors collect data each hour. All of the monitors operate year-round. Table 30 summarizes the status for each current and proposed monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in 40 CFR58 Appendices A, C, D and E and also provides the proposed changes to the network.

**Table 27 Design Values and Required Fine Particle Monitors for North Carolina
Metropolitan Statistical Areas (MSA)**

MSA	Population Estimate (2013) ^a	2013 Fine Particle Design Value (As percent of NAAQS)		Number of Monitors operated in North Carolina ^b	
		24-Hour	Annual	Required	Current
Charlotte-Concord-Gastonia, NC-SC	2,335,358	62	82	2	5
Virginia Beach-Norfolk-New Port News, VA-NC	1,707,369	74 ^c	86 ^c	3	0 ^d
Raleigh, NC	1,214,516	64	84	2	2
Greensboro-High Point	741,065	57	73	1	2
Winston-Salem	650,820	56	84	1	3
Durham- Chapel Hill	534,578	51	70	1	2
Asheville	437,657	56	76	0	2
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	404,951	Not available		0	0
Fayetteville	377,193	56	76	0	1
Hickory	363,572	55	79	0	1
Wilmington	268,601	61	61	0	1
Jacksonville	185,220	Not available		0	0
Greenville	174,263	55	65	0	1
Burlington	154,378	56	74	0	1
Rocky Mount	150,667	54	69	0	0
New Bern	127,657	Not available		0	0
Goldsboro	124,583	57	75	0	1

^a Source: U.S. Census Bureau, Population Division, Released March 2013, available on the world wide web at <http://www.census.gov/popest/data/counties/totals/2012/index.html>

^b Includes monitors operated by NC-DAQ and the local programs; see Table 28 for more details.

^c Design value for 2009-2011.

^d Virginia Department of Environmental Quality (VDEQ), Office of Air Quality Monitoring operates three monitors in this MSA.

^e Based on measurements taken in 2007, when the monitor was shut down.

Table 28 North Carolina Fine Particle Monitoring Network – Monitor Locations ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370710016	Grier Middle School	1622 East Garrison Blvd.	Gastonia	W 081 09' 20"	N 35 15' 16"	Charlotte-Concord-Gastonia
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	W 080 46' 59"	N 35 14' 28"	Charlotte-Concord-Gastonia
371190042 ^b	Montclair	1935 Emerywood Drive	Charlotte	W 080 52' 01"	N 35 09' 05"	Charlotte-Concord-Gastonia
371190043 ^b	Oakdale	513 Radio Road	Charlotte	W 080 53' 15"	N 35 18' 15"	Charlotte-Concord-Gastonia
371590021	Rockwell	301 West Street	Rockwell	W 080 23' 72"	N 35 33' 11"	None

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371010002	West Johnston	3411 Jack Road ^c	Clayton	W 078 26' 15"	N 35 30' 0"	Raleigh
371830014	Millbrook	3801 Spring Forest Road	Raleigh	W 078 34' 27"	N 35 51' 22"	Raleigh

Greensboro-High Point Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370810013	Mendenhall	205 Willoughby Blvd.	Greensboro	W 079 48' 04"	N 36 06' 33"	Greensboro
370810014 ^c	Colfax	2171 Sandy Ridge Road	High Point	W 080 01' 00"	N 36 00' 00"	Greensboro

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370370004	Pittsboro	325 Russett Run Road	Pittsboro	W 079 09' 55"	N 35 45' 32"	Durham-Chapel Hill
370630015 ^d	Durham Armory	801 Stadium Drive	Durham	W 078 54' 14"	N 36 01' 58"	Durham-Chapel Hill

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370570002	Lexington Water Tower	938 South Salisbury Street	Lexington	W 080 15' 77"	N 35 48' 87"	Winston-Salem
370670022 ^e	Hattie Ave.	Corner of 13 th & Hattie Avenue	Winston-Salem	W 080 13' 36"	N 36 06' 38"	Winston-Salem
370670030 ^e	Clemmons	Fraternity Church Road	Clemmons	W 080 20' 31"	N 36 01' 34"	Winston-Salem

Asheville Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370210034 ^f	Board of Ed	175 Bingham Road	Asheville	W 082 37' 7"	N 35 36' 27"	Asheville
370870012 ^g	Waynesville Recreation Center	550 Vance Street	Waynesville	W 082 58' 45"	N 35 30' 21"	Asheville

Table 28 North Carolina Fine Particle Monitoring Network – Monitor Locations ^a

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370510009	William Owen	4533 Raeford Road	Fayetteville	W 078 57' 19"	N 35 07' 49"	Fayetteville

Hickory Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370350004	Hickory Water Tower	Water Tank 15 First Avenue	Hickory	W 081 21' 58"	N 35 43' 45"	Hickory

Wilmington Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371290002	Castle Hayne	6028 Holly Shelter Road	Castle Hayne	W 077 50' 36"	N 34 21' 87"	Wilmington

Greenville Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371470006 ^h	Pitt County	403 Government Cir	Greenville	W 077 21' 00"	N 35 38' 00"	Greenville

Burlington Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370010002	Hopedale	827 South Graham-Hopedale Road	Burlington	W 079 24' 30"	N 36 05' 20"	Burlington

Goldsboro Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371910005	Dillard	1101 South Devereau Street	Goldsboro	W 077 59' 63"	N 35 22' 16"	Goldsboro

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370330001	Cherry Grove	7074 Cherry Grove Road	Reidsville	W 079 28' 5"	N 36 18' 25"	None
370610002	Kenansville	328 Limestone Road	Kenansville	W 077 57' 65"	N 34 57' 29"	None
371110004	East Marion	700 State Street	Marion	W 081 59' 38"	N35 41' 15"	None
371170001	Jamesville	33215 US Highway 64	Jamesville	W 076 54' 23"	N 35 48' 38"	None
371210001	Spruce Pine	138 Highland Avenue	Spruce Pine	W 082 04' 24"	N 35 54' 55"	None
371230001	Candor	112 Perry Drive	Candor	W 079 50' 11"	N 35 15' 47"	None
371550005	Linkhaw	1170 Linkhaw Road	Lumberton	W 078 59' 25"	N 34 38' 33"	None
371730002	Bryson City	Parks & Rec Bldg, Center Street	Bryson City	W083 26' 38"	N35 26' 06"	None
371890003	Boone	361 Jefferson Road	Boone	W 081 39' 47"	N 36 13' 19"	None

^a All monitors use an R & P Model 2025 PM2.5 Sequential Monitor with a WINS impactor (Air Quality System (AQS) Method Code 118) except the Bryson and Millbrook monitors which use a Met One BAM-1020 Monitor (Air

Table 28 North Carolina Fine Particle Monitoring Network – Monitor Locations ^a

Quality System (AQS) Method Code 170). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58. All monitors except the Bryson, Cherry Grove and Millbrook monitors use the U.S. EPA reference method designation RFPS-0498-118. Millbrook, Cherry Grove and Bryson monitors use the U.S. EPA Automated Equivalent Method: EQPM-0308-170.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c This monitor started on January 1, 2008, to meet minimum monitoring requirements in 40CFR58 Appendix D.

^d This monitor started on January 1, 2008, to replace the Durham Health monitor.

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^f Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

^g This monitor started on January 1, 2008, to replace the Waynesville Fire Station monitor.

^h This monitor started on January 1, 2008, to replace the South Greenville monitor. This site is a collocated fine particle and ozone monitoring site.

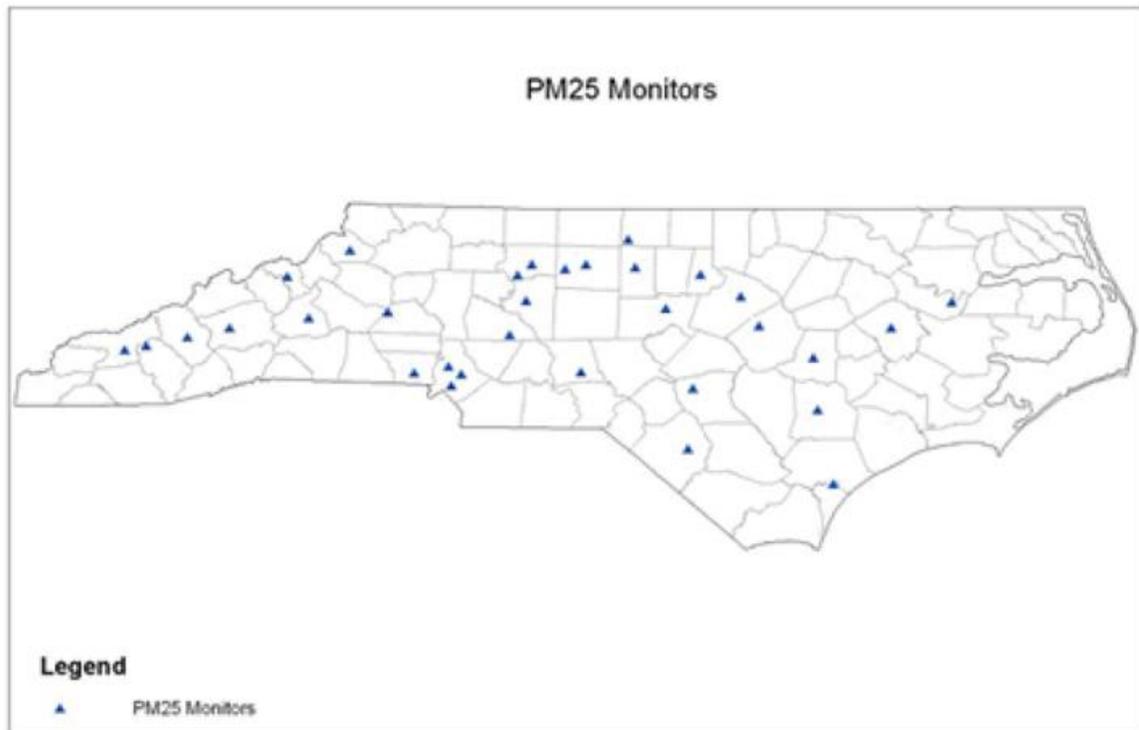


Figure 62. Locations of 2014 FRM/FEM Fine Particle Monitoring Stations

Table 29 Statement of Purpose for North Carolina Fine Particle Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370710016	Grier Middle School	SLAMS	1-in-6 day ^c	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Urban
371190041 ^d	Garinger	NCORE	1-in-3 day ^e	1 of 3 Required Monitors in Charlotte-Concord-Gastonia MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371190042 ^d	Montclair	SLAMS	1-in-3 day ^f	1 of 3 Required Monitors in Charlotte-Concord-Gastonia MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371190043 ^d	Oakdale	SLAMS	1-in-3 day	1 of 3 Required Monitors in Charlotte-Concord-Gastonia MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371590021	Rockwell	SLAMS	1-in-3 day ⁿ	Compliance with NAAQS.	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371010002	West Johnston ^c	SLAMS	1-in-3 day	1 of 2 required Monitors in Raleigh MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371830014	Millbrook	NCORE	Hourly; collocated 1-in-3 day ^g	1 of 2 Required Monitors in Raleigh MSA. AQI Reporting. Compliance w/NAAQS. Air Quality Forecasting	Population Exposure	Neighborhood

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370810013	Mendenhall	SLAMS	1-in-6 day ^c	Required Monitor in Greensboro-High Point MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure/ General/ Background	Neighborhood
370810014	Colfax	SLAMS	1-in-3 day	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370570002	Lexington	SLAMS	1-in-3 day ^l	Required monitor for nonattainment area & the Winston-Salem MSA. Compliance w/NAAQS	Population Exposure	Neighborhood
370670022 ^h	Hattie Ave.	SLAMS	1-in-1 day ^l	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
370670030 ^h	Clemmons	SLAMS	1-in-3 day ^f	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370370004	Pittsboro	SLAMS	1-in-3 day	AQI Reporting. Compliance w/NAAQS	Population Exposure	Regional
370630015	Durham Armory	SLAMS	1-in-3 day ^c	Design Value monitor for the Durham-Chapel Hill MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Table 29 Statement of Purpose for North Carolina Fine Particle Monitoring Network ^a

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370210034 ^m	Board of Ed	SLAMS	1-in-3 day ⁿ	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
370870012 ^o	Waynesville Recreation Center	SLAMS	1-in-3 day	Design Value monitor for the Asheville MSA. AQI Reporting. Compliance with NAAQS.	Population Exposure	Neighborhood

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370510009	William Owen	SLAMS	1-in-6 day ^c	AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370350004	Hickory Water Tower	SLAMS	1-in-3 day ⁿ	Required monitor for the Hickory MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371290002	Castle Hayne	SPECIAL PURPOSE	1-in-3 day ^c	To evaluate performance of the BAM in the coastal Carolina area	Population Exposure	Neighborhood

Greenville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371470006	Agricultural Extension	SLAMS	1-in-3 day	Compliance with NAAQS.	Population Exposure	Neighborhood

Burlington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370010002	Hopedale	SLAMS	1-in-6 day ^c	Compliance w/NAAQS.	Population Exposure	Neighborhood

Goldsboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371910005	Dillard	SLAMS	1-in-3 day ^c	Compliance w/NAAQS.	Population Exposure	Urban

Table 29 Statement of Purpose for North Carolina Fine Particle Monitoring Network ^a

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370330001	Cherry Grove	SLAMS	Hourly ^c	Required regional transport monitor for the piedmont and central area of the state. Compliance w/NAAQS.	Population Exposure/ Regional Transport/ General/ Background	Urban
370610002 ^c	Kenansville	SLAMS	1-in-3 day	Required General/ Background monitor for the coastal area	Welfare Related Impacts/ General/ Background	Regional
371110004	East Marion	SLAMS	1-in-3 day ^f	Compliance with NAAQS.	Population Exposure	Neighbor-hood
371170001	Jamesville	SLAMS	1-in-3 day ^c	Required regional transport monitor for coastal region, providing information on fine particle concentrations entering & leaving state. Compliance w/NAAQS.	Regional Transport/ General/ Background/ Population Exposure	Urban
371210001	Spruce Pine	SLAMS	1-in-3 day	Compliance with NAAQS.	Population Exposure	Neighbor-hood
371230001	Candor	SLAMS	1-in-3 day	Required General/ Background monitor for piedmont/central region	Welfare Related Impacts/General/ Background	Regional
371550005	Linkhaw	SLAMS	1-in-3 day	Compliance with NAAQS.	Population Exposure	Neighbor-hood
371730002	Bryson City	SLAMS	Hourly	Required Transport Monitor for Western Mountain Area. Compliance w/NAAQS. Air Quality Forecasting.	Regional Transport/ Population Exposure	Neighbor-hood
371890003	Boone	SLAMS	1-in-3 day	Required general/background monitor for western mountain area. Compliance w/NAAQS.	General/Background/ Population Exposure	Neighbor-hood

^a All monitors use an R & P Model 2025 PM2.5 Sequential Monitor with a WINS impactor (Air Quality System (AQS) Method Code 118) except the Bryson, Cherry Grove and Millbrook monitors which use a Met One BAM-1020 Monitor (Air Quality System (AQS) Method Code 170). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58. All monitors except the Bryson, Cherry Grove and Millbrook monitors use the U.S. EPA reference method designation RFPS-0498-118. Millbrook Cherry Grove and Bryson monitors use the U.S. EPA Automated Equivalent Method: EQPM-0308-170.

^b All monitors operate on a 24-hour schedule, collecting a sample from midnight to midnight, Eastern Standard Time except the Bryson, Cherry Grove and Millbrook monitors, which operate hourly.

^c Collocated with a continuous fine particle monitor.

^d Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^e Collocated with an every 3rd day speciation monitor and a continuous fine particle monitor.

^f Collocated with an every 6th day precision monitor and a continuous fine particle monitor.

^g Collocated with a 1-in-3 day manual monitor and 1-in-3 day speciation monitor.

^h Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^l Collocated with an every 6th day speciation monitor and a continuous fine particle monitor.

^m Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

ⁿ Collocated with an every 6th day precision monitor, an every 6th day speciation monitor and a continuous fine particle monitor.

^o This monitor started on January 1, 2008, to replace the Waynesville Fire Station monitor.

Table 30 Status of North Carolina Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
370710016	Grier Middle School	Yes	No – not a required monitor.	Will shut down 12/31/2014
371190041 ^c	Garinger	Yes	Yes- 1 of 2 Required Monitors for the Charlotte-Concord-Gastonia MSA.	None
371190042 ^c	Montclair	Yes	Yes- 1 of 2 Required Monitors for the Charlotte-Concord-Gastonia MSA.	None
371190043 ^c	Oakdale	Yes	No – not a required monitor.	None
371590021	Rockwell	Yes	No – not a required monitor.	None

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
371010002	West Johnston	Yes	Yes - 1 of 2 Required Monitors for the Raleigh MSA.	None
371830014	Millbrook	Yes	Yes - 1 of 2 Required Monitors for the Raleigh MSA.	None

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
370810013	Mendenhall	Yes	Yes - Required Monitor for the Greensboro-High Point MSA.	None
370810014 ^d	Colfax	Yes	No – not a required monitor.	Will shut down 12/31/2014

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
370570002	Lexington Water Tower	Yes	Yes- Required monitor for the Winston-Salem MSA.	None
370670022 ^f	Hattie Ave.	Yes	No – not a required monitor.	None
370670030 ^f	Clemmons	Yes	No – not a required monitor.	None

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
370370004	Pittsboro	Yes	No – not a required monitor.	Will shut down 12/31/2014
370630015 ^e	Durham Armory	Yes	Yes – Required monitor for the Durham-Chapel Hill MSA.	None

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
370210034 ^g	Board of Ed	Yes	No – not a required monitor.	Will shut down
370870012 ^h	Waynesville Recreation Center	Yes	No – not a required monitor.	None

Table 30 Status of North Carolina Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
370510009	William Owen	Yes	No – not a required monitor.	None

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
370350004	Hickory Water Tower	Yes	Yes - Required monitor for the Hickory MSA.	None

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
371290002	Castle Hayne	Yes	No – not a required monitor.	Method may change in 2015

Greenville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
371470006 ⁱ	Pitt County Agricultural Center	Yes	No – not a required monitor.	None

Burlington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
370010002	Hopedale	Yes	No – not a required monitor.	Will shut down 12/31/2014

Goldsboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
371910005	Dillard	Yes	No – not a required monitor.	Will shut down 12/31/2014

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b D	Proposal to Move or Change
370330001	Cherry Grove	Yes	Yes - Required regional transport monitor for the piedmont and central area of the state.	Method changed 3/1/2014
370610002	Kenansville	Yes	Yes - Required General/ Background monitor for the coastal area	Method may change in 2015
371110004	East Marion	Yes	No – not a required monitor.	None
371170001	Jamesville	Yes	Yes - Required regional transport monitor for the coastal part of the state	Method may change in 2015
371210001	Spruce Pine	Yes	No – not a required monitor.	None
371230001	Candor	Yes	Yes - Required General/ Background monitor for the piedmont/central area of state	Method may change in 2015
371550005	Linkhaw	Yes	No – not a required monitor.	Will shut down 12/31/2014
371730002	Bryson City	Yes	Yes - Required Transport Monitor for Western Mountain Area.	None

Table 30 Status of North Carolina Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

371890003	Boone	Yes	Yes- Required general/ background monitor for the western mountain area.	None
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^a All monitors use an R & P Model 2025 PM_{2.5} Sequential Monitor with a WINS impactor (Air Quality System (AQS) Method Code 118) except the Bryson and Millbrook monitors which use a Met One BAM-1020 Monitor (Air Quality System (AQS) Method Code 170). All monitors except the Bryson and Millbrook monitors use the U.S. EPA reference method designation RFPS-0498-118. Millbrook and Bryson monitors use the U.S. EPA Automated Equivalent Method: EQPM-0308-170.

^b All monitors meet the requirements of Appendix A to 40CFR58. The Quality Assurance Project Plan and Standard Operating Procedures are being revised to reflect the changes to Appendix A of 40CFR58 promulgated in 2006. All monitors meet the requirements of Appendix C to 40CFR58. All monitors meet the requirements of Appendix E of 40CFR58.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d This monitor started on January 1, 2008, to meet minimum monitoring requirements in 40CFR58 Appendix D.

^e This monitor started on January 1, 2008, to replace the Durham Health monitor. It is collocated with a continuous fine particle monitor.

^f Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^g Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

^h This monitor started on January 1, 2008, to replace the Waynesville Fire Station monitor.

ⁱ This monitor started on April 1, 2008, to replace the South Greenville monitor. This site is a collocated fine particle and ozone-monitoring site.

B. Continuous Fine Particle Monitoring Network

The North Carolina Division of Air Quality (NC-DAQ) currently operates 19 continuous fine particle monitoring sites and the local programs operate five. These monitors are used to meet federal requirements for air quality forecasting, providing real-time data to the public and meeting air quality index reporting requirements. Three of these monitors have been approved by the United States Environmental Protection Agency (EPA) for determining compliance with the National Ambient Air Quality Standards (NAAQS). Five of these monitors are also required by 40 CFR 58 Appendix D 4.7.2, which states: “Requirement for Continuous PM_{2.5} Monitoring. The state, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies.” According to Table 27, a continuous monitor collocated with an FRM is required in Charlotte (operated by the local program), Raleigh, Greensboro, Winston-Salem (operated by the local program) and Durham.

Besides being required by 40 CFR 58 Appendix D 4.7.2, continuous fine particle monitors are also required for real-time reporting (40 CFR 58 Appendix D 1.1(a), air quality forecasting and air quality index reporting (40 CFR 58 Appendix G 3). The NC-DAQ is required by 40 CFR 58 Appendix G to do air quality index reporting in three MSAs that are not required to have a continuous monitor by 40 CFR 58 Appendix D: Asheville (operated by the local program), Fayetteville and Hickory. Thus, these three continuous monitors are needed to meet Appendix G requirements. Of the 16 remaining continuous monitors, two are FEMs (Bryson City and Cherry Grove) included in the

FRM/FEM network and were evaluated earlier as part of that network. The NC-DAQ evaluated the remaining 14 continuous monitors operated by NC-DAQ to determine if they still added value to the network and should continue operating.

Three of these sites, Grier School in Gastonia, Hopedale in Burlington and Dillard School in Goldsboro were discussed earlier in The Federal Reference Method and Federal Equivalent Method Network subsection. The NC-DAQ decided to shut down the FRM monitors at Grier School, Hopedale and Dillard School. The continuous monitors located at these sites were also evaluated at the same time and a decision was made that the continuous monitors at Grier and Dillard Schools were not needed for air quality forecasting, real-time data reporting, or air quality index reporting. As a result these two continuous fine particle monitors will be shut down at the end of 2014. The continuous monitor at Hopedale is used for air quality forecasting and so it will continue operating.

Of the remaining 11 sites, the NC-DAQ is currently evaluating the Met One BAM 1020 FEM to replace the 2025 sequential FRM monitors currently used in the FRM/FEM fine particle network at four of those sites. The NC-DAQ plans to replace continuous monitors at four additional sites with BAMs by the end of the year. The evaluation process requires operating the collocated BAM and FRM for a period of 12 to 24 months. Currently, four BAMs, one each at Castle Hayne, Kenansville, Jamesville and Candor, are in the process of being evaluated. Later this year four additional BAMs, one each, will be added to the network for evaluation at Boone (new continuous fine particle site), Lexington, Rockwell and Hickory (also required for AQI reporting). On-site evaluation is necessary for the BAM because its performance is dependent on the locale where it is operating. Thus the NC-DAQ determined that the eight continuous monitors involved in this evaluation need to continue operating.

The three remaining sites were also evaluated. The Blackstone site is a special purpose site established as part of a study commissioned by the NC legislature to measure background air quality in Lee County before shale gas development begins in that area. The fine particle special purpose, non-regulatory, continuous monitor started operating on January 1, 2014 and is scheduled to run for 12 to 24 months. The Leggett fine particle continuous monitor is required for air quality forecasting in the Rocky Mount area, thus the NC-DAQ cannot shut this monitor down as long as air quality forecasting continues for this area. The Marion fine particle continuous monitor continues to provide valuable data on the fine particle concentrations at the boundary between the piedmont and the mountains so the NC-DAQ decided to continue operating this monitor for at least another year.

Table 31 lists the sites in the North Carolina Fine Particle monitoring network with continuous monitors, their sampling schedules, monitoring objectives, scale of representation and statement of purpose. Table 32 indicates whether the monitor is suitable for comparison to the NAAQS, it meets 40CFR58 Appendix C and D requirements and any proposed changes.

Table 31 Locations and Schedules for Continuous Monitors in the North Carolina Fine Particle Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370710016	Grier Middle School	SLAMS	Hourly	Real-time data reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood
371190041 ^d	Garinger	NCORE	Hourly	Required Monitor for the Charlotte-Concord-Gastonia MSA.	Population Exposure	Neighborhood
371190042 ^d	Montclair	SLAMS	Hourly	Real-time data reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood
371590021	Rockwell	NONREG-ULATORY	Hourly	Real-time data reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
371830014	Millbrook	NCORE	Hourly	Required Monitor for the Raleigh MSA.	Population Exposure	Neighborhood

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370810013	Mendenhall	SLAMS	Hourly	Required Monitor for the Greensboro-High Point MSA.	Population Exposure/ General/ Background	Neighborhood

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370570002	Lexington Water Tower	SLAMS	Hourly	Real-time data reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood
370670022 ^e	Hattie Ave.	SLAMS	Hourly	Required Monitor for the Winston-Salem MSA.	Population Exposure	Neighborhood
370670030 ^e	Clemmons	SLAMS	Hourly	Real-time data reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370630015	Durham Armory	SLAMS	Hourly	Required monitor for the Durham-Chapel Hill MSA	Population Exposure	Neighborhood

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370210034 ^f	Board of Ed	SLAMS	Hourly	Air Quality Index reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370510009	William Owen	SLAMS	Hourly	Air Quality Index reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood

Table 31 Locations and Schedules for Continuous Monitors in the North Carolina Fine Particle Monitoring Network ^a

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370350004	Hickory Water Tower	SLAMS	Hourly	Air Quality Index reporting. Fine Particle Forecasting.	Population Exposure	Neighborhood

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
371290002	Castle Hayne	NONREG-ULATORY	Hourly	Air Quality Index reporting. Real-time data reporting.	Population Exposure	Neighborhood

Burlington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370010002 ^d	Hopedale	SLAMS	Hourly	Real-time data reporting. Air Quality Forecasting	Population Exposure	Neighborhood

Rocky Mount Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370650099	Leggett	NONREG-ULATORY	Hourly	Real-time data reporting. Air Quality Forecasting.	General Background	Urban

Goldsboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
371910005	Dillard	NONREG-ULATORY	Hourly	Real-time data reporting.	Population Exposure	Urban

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose ^c	Monitoring Objective	Scale
370330001	Cherry Grove	SLAMS	Hourly	Regional transport monitor for the piedmont and central area of the state.	Population Exposure/ Regional Transport/ General/ Background	Urban
370610002	Kenansville	NONREG-ULATORY	Hourly	General background monitor for the coastal plain	Population Exposure General/ Background	Neighborhood
371050002	Blackstone	Special Purpose	Hourly	Shale gas development background monitoring	General/ Background	Neighborhood
371110004	East Marion	NONREG-ULATORY	Hourly	Real-time data reporting.	Population Exposure	Neighborhood
371170001	Jamesville	NONREG-ULATORY	Hourly	Regional transport monitor for the coastal part of the state.	Regional Transport/ General/Background/ Population Exposure	Urban
371290001	Candor	NONREG-ULATORY	Hourly	General background monitor for the piedmont	General Background/ Population Exposure	Regional
371730002	Bryson City	SLAMS	Hourly	Transport Monitor for Western Mountain Area.	Regional Transport/ Population Exposure	Neighborhood
371890003	Boone	Special Purpose	Hourly	Background monitor for mountain area	General/ Background	Neighborhood

Table 31 Locations and Schedules for Continuous Monitors in the North Carolina Fine Particle Monitoring Network ^a

^a All monitors use an R & P Model 1400A PM2.5 Tapered-Element Oscillating Microbalance operated with the inlet heated to 50 degrees except the monitors at Bryson City, Castle Hayne, Kenansville, Dillard School, Jamesville, Cherry Grove, Candor, Blackstone and Millbrook and the proposed monitor at Boone, which use a Met One BAM-1020 Monitor. All monitors in this table meet the requirements of 40CFR58 Appendices A and E.

^b All monitors operate year-round.

^c All monitors provide real-time air quality data to the public through AirNow and the state and local program websites.

^d Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669).

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^f Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

Table 32 Status of North Carolina Continuous Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370710016	Grier Middle School	No	No – AQS Method Code 702	No – not a required monitor.	Will shut down 12/31/2014
371190041 ^b	Garinger	No	No – AQS Method Code 717	Yes- 1 of 1 Required Monitors for the Charlotte-Concord-Gastonia MSA.	None
371190042 ^b	Montclair	No	No – AQS Method Code 717	No – not a required monitor.	None
371590021	Rockwell	No	No – AQS Method Code 702	No – not a required monitor.	Method will change 1/1/2015

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371830014	Millbrook	Yes	Yes – AQS Method Code 170	Yes - 1 of 1 Required Monitors for the Raleigh MSA	None

Greensboro-High Point Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370810013 ^c	Mendenhall	No	No – AQS Method Code 702	Yes - Required Monitor	None

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370570002	Lexington Water Tower	No	No – AQS Method Code 702	No – not a required monitor.	Method will change in 2014
370670022 ^d	Hattie Ave.	No	No – AQS Method Code 702	Yes - Required Monitor	None
370670030 ^d	Clemmons	No	No – AQS Method Code 702	No – not a required monitor.	None

Table 32 Status of North Carolina Continuous Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370630015 ^c	Durham Armory	No	No – AQS Method Code 702	Yes - Required Monitor	Method will change 1/1/15

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370210034 ^e	Board of Ed	No	No – AQS Method Code 702	No – not a required monitor.	None

Fayetteville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370510009 ^c	William Owen	No	No – AQS Method Code 702.	No – not a required monitor	None

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370350004 ^c	Hickory Water Tower	No	No – AQS Method Code 702	No – not a required monitor.	Method will change 1/1/2015

Wilmington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371290002	Castle Hayne	No	Yes – AQS Method Code 170	No – not a required monitor.	Request data not be used for NAAQS starting 10/23/2014

Burlington Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370010002	Hopedale	No	No – AQS Method Code 702	No – not a required monitor	None

Rocky Mount Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370650099	Leggett	No	No – AQS Method Code 717	No – not a required monitor.	None

Goldsboro Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371910005	Dillard	No	Yes – AQS Method Code 170	No – Not a required monitor	Site will shut down 12/31/2014

Table 32 Status of North Carolina Continuous Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370330001	Cherry Grove	No	Yes – AQS Method Code 170	Yes – Required transport monitor	Become the SLAMS monitor 3/1/2014
370610002	Kenansville	No	Yes – AQS Method Code 170	No – not a required monitor.	Request data not be used for NAAQS
371050002	Blackstone	No	Yes – AQS Method Code 170	No – not a required monitor.	BAM started 1/1/2014
371110004	East Marion	No	No – AQS Method Code 702	No – not a required monitor.	None
371170001	Jamesville	No	Yes – AQS Method Code 170	No – not a required monitor.	Request data not be used for NAAQS
371290001	Candor	No	Yes – AQS Method Code 170	No – not a required monitor.	Add a BAM to the site in 2013
371730002	Bryson City	Yes	Yes – AQS Method Code 170	No – not a required monitor.	None
371890003	Boone	No	Yes – AQS Method Code 170	No – not a required monitor.	Will add a BAM to the site in 2014

^a All monitors meet the requirements of Appendix A to 40CFR58 except as noted below. The Quality Assurance Project Plan and Standard Operating Procedures have been revised to reflect the changes to Appendix A of 40CFR58 promulgated in 2006. Except for at Bryson City, Castle Hayne, Kenansville, Dillard School, Jamesville, Cherry Grove, Candor, Blackstone and Millbrook and the proposed monitor at Boone, these monitors are not reference or equivalent methods and do not meet the requirements of Appendix C to 40CFR58. All monitors meet the requirements of Appendix E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c These monitors do not meet the requirements in Appendix A for the inlets of collocated monitors to be within 1 meter of each other vertically.

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^e Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

C. Manual Speciation Fine Particle Monitoring Network

The North Carolina Division of Air Quality (NC-DAQ) currently operates four manual speciation fine particle monitoring sites and the local programs operate three. These monitors are used to meet Federal requirements for the Speciation Trend Network (STN) and for national core (NCORE) monitoring stations as well as to provide the state with information on the composition of fine particles throughout the state. The monitor at Garinger is required by 40 CFR 58 Appendix D 4.7.4, which requires the agency to continue operating STN monitors. The monitors at Garinger and Millbrook are required by 40 CFR 58 Appendix D 3(b), which lists the required monitors at NCORE sites.

The other five monitors are not required by 40 CFR 58 Appendix D and the EPA has decided to shut down these monitors at the end of 2014. The NC-DAQ evaluated the monitors in Asheville, Rockwell, Winston-Salem, Lexington and Hickory to see how well they correlate with the monitors in Charlotte and Raleigh. Table 33 shows the

correlation coefficients using sulfate, nitrate, total elemental carbon and total organic carbon measured from January 2008 to January 2014.

Table 33. Correlation Coefficients of Chemical Speciation Network Monitors Slated for Discontinuation with Charlotte and Raleigh (January 2008 to January 2014)

Fine Particle Component	Asheville	
	Charlotte	Raleigh
Sulfate (SO ₄)	0.6149	0.3887
Nitrate (NO ₃)	0.4478	0.3788
Elemental Carbon (EC)	0.4894	0.4332
Organic Carbon (OC)	0.5713	0.4361
Fine Particle Component	Hickory	
	Charlotte	Raleigh
Sulfate (SO ₄)	0.6937	0.5818
Nitrate (NO ₃)	0.5266	0.4284
Elemental Carbon (EC)	0.4791	0.5530
Organic Carbon (OC)	0.5809	0.5378
Fine Particle Component	Rockwell	
	Charlotte	Raleigh
Sulfate (SO ₄)	0.8277	0.7217
Nitrate (NO ₃)	0.8653	0.7993
Elemental Carbon (EC)	0.7016	0.5883
Organic Carbon (OC)	0.7722	0.5794
Fine Particle Component	Winston-Salem	
	Charlotte	Raleigh
Sulfate (SO ₄)	0.7588	0.7325
Nitrate (NO ₃)	0.7771	0.7822
Elemental Carbon (EC)	0.5346	0.6148
Organic Carbon (OC)	0.5696	0.6203
Fine Particle Component	Lexington	
	Charlotte	Raleigh
Sulfate (SO ₄)	0.8019	0.7416
Nitrate (NO ₃)	0.8191	0.8187
Elemental Carbon (EC)	0.6196	0.7237
Organic Carbon (OC)	0.6473	0.6178

Table 34 lists the sites in the North Carolina manual speciation fine particle monitoring network with their sampling schedules, monitoring objectives, scale of representation and statement of purpose. Table 35 indicates whether the monitor is suitable for comparison to the NAAQS, it meets 40CFR58 Appendix C and D requirements and any proposed changes.

Table 34 Locations and Schedules for Manual Speciation Monitors in the North Carolina Fine Particle Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371190041 ^c	Garinger	NCORE	1-in-3 day, 24-hour	Required Monitor for NCore.	Population Exposure	Neighbor-hood
371590021	Rockwell	Supplemental Speciation	1-in-6 day, 24-hour	Provide comparison data for hourly speciation monitors	Population Exposure	Neighbor-hood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	NCORE	1-in-3 day, 24-hour	Required Monitor for NCore	Population Exposure	Neighbor-hood

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370570002	Lexington Water Tower	Supplemental Speciation	1-in-6 day, 24-hour	Provide speciation data for Lexington	Population Exposure	Neighbor-hood
370670022 ^d	Hattie Ave.	Supplemental Speciation	1-in-6 day, 24-hour	Provide speciation data for Winston-Salem	Population Exposure	Neighbor-hood

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370210034 ^e	Board of Ed	Supplemental Speciation	1-in-6 day, 24-hour	Provide speciation data for Asheville	Population Exposure	Neighbor-hood

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
370350004	Hickory Water Tower	Supplemental Speciation	1-in-6 day, 24-hour	Provide speciation data for Hickory	Population Exposure	Neighbor-hood

^a All monitors use a Met One SuperSASS for mass, metals and ions and an URG 3000N for elemental and organic carbon. All monitors in this table meet the requirements of 40CFR58 Appendices A and E.

^b All monitors operate year-round.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669).

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

^e Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

Table 35 Status of North Carolina Manual Speciation Fine Particle Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371190041 ^b	Garinger	No	No – AQS Method Codes 810-812, 838-842	Yes- This site is a Speciation Trend Network site & NCore.	None
371590021	Rockwell	No	No – AQS Method Codes 810-812, 838-842	No – not a required monitor.	Will shut down 12/31/2014

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371830014	Millbrook	No	No – AQS Method Codes 810-812, 838-842	Yes –NCore site	None

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370570002	Lexington Water Tower	No	No – AQS Method Codes 810-812, 838-842	No – not a required monitor.	Will shut down 12/31/2014
370670022 ^c	Hattie Ave.	No	No – AQS Method Codes 810-812, 838-842	No – not a required monitor.	Will shut down 12/31/2014

Asheville Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370210034 ^d	Board of Ed	No	No – AQS Method Codes 810-812, 838-842	No – not a required monitor.	Will shut down 12/31/2014

Hickory Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370350004	Hickory Water Tower	No	No – AQS Method Codes 810-812, 838-842	No – not a required monitor.	Shut down 5/31/2014

^a All monitors meet the requirements of Appendix A to 40CFR58 except as noted below. These monitors are not reference or equivalent methods and do not meet the requirements of Appendix C to 40CFR58. All monitors meet the requirements of Appendix E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^d Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

VIII. Lead Monitoring Network

The North Carolina Division of Air Quality (NC-DAQ) currently operates one lead monitor located at the Raleigh Millbrook National Core (NCore) monitoring site. In 2008 the United States Environmental Protection Agency (EPA) lowered the lead National Ambient Air Quality Standard (NAAQS) to 0.15 micrograms per cubic meter and expanded the lead monitoring network to support the new standard. In December 2010, the EPA finalized changes to the lead monitoring network. These changes included lowering the threshold for fence line monitoring for lead-emitting facilities from 1 ton of lead per year to 0.5 tons of lead per year and changing the population oriented monitoring from urban areas with populations greater than 500,000 to NCore monitoring sites in urban areas with populations greater than 500,000. Fence line monitoring at facilities emitting more than 1 ton of lead per year or that impact the ambient concentrations surrounding the facility such that ambient levels are at one half of the NAAQS or greater started on January 1, 2010. Fence line monitoring at facilities emitting more than 0.5 ton of lead per year and population oriented monitoring at required NCore sites started on December 27, 2011.

In 2009 the NC-DAQ requested and received permission to not do fence-line lead monitoring at three facilities which were listed in the 2005 National Emission Inventory (NEI) or the 2007 Toxic Release Inventory (TRI) as emitting over 1 ton of lead per year. These facilities are:

- International Resistive Company (IRC) located in Boone, NC,
- Nucor Steel located in Cofield, NC and
- Carolina Power and Light Company (Progress Energy) Roxboro Steam Station located in Semora, NC,

The EPA granted the request and did not require the NCDAQ to monitor at any of these facilities because none of the facilities actually emitted 1 ton or more of lead per year. A copy of the EPA approval letter is provided in Appendix D. 2010 Network Plan EPA Approval Letter.

In 2011 the EPA listed eight facilities in North Carolina as emitting over 0.5 tons of lead per year based either on the 2008 NEI or the 2009 TRI. These facilities are:

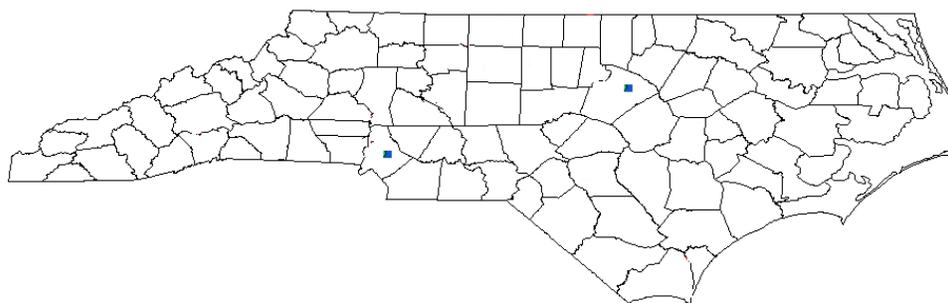
- Duke Energy Carolinas, LLC - Belews Creek Steam Station, located in Stokes County;
- Progress Energy - Roxboro Plant, located in Person County;
- Duke Energy Carolinas, LLC - Marshall Steam Station, in Catawba County;
- U.S. Army Fort Bragg, located in Cumberland County;
- Blue Ridge Paper Products Inc, located in Canton, North Carolina (Haywood County);
- Duke Power Company, LLC - Allen Steam Station, located in Gaston County;

- Royal Development Co., located in High Point, North Carolina (Guilford County); and
- U.S. Marine Corps Camp Lejeune Marine Corps Base, located in Onslow County.

In addition to the eight facilities on the EPA list, the NC DAQ identified an additional facility, Saint- Gobain Containers, located in Wilson, NC (Wilson County), with reported 2009 lead emissions greater than 0.5 tons.

As mentioned earlier, the NC DAQ received permission not to monitor at one of these facilities, Progress Energy - Roxboro Plant in 2009. In 2011 the NC DAQ requested that this facility and six other of these facilities (Fort Bragg, Camp Lejeune, Royal Development Co., the Duke Energy Carolinas, LLC - Belews Creek Steam Station, the Duke Energy Carolinas, LLC - Marshall Steam Station and the Duke Power Company, LLC - Allen Steam Station) be removed from the list because they emit less than 0.5 tons per year and requested waivers for the other two (Blue Ridge Paper Products, Inc. and St. Gobain Containers) based on results of modeling. The EPA granted this request and did not require the NCDAQ to monitor at any of these facilities. A copy of the EPA approval letter is provided in Appendix E. 2011 Network Plan EPA Approval Letter.

Under the 2010 lead monitoring rule, North Carolina is required to operate two population-oriented lead monitors as shown in Figure 63. These monitors are located at the NCore monitoring sites—in Charlotte at Garinger High School and in Raleigh at Millbrook East Middle School. The monitors at Millbrook and Garinger started operation on December 27, 2011. The first sampling day was December 29. These monitors operate on a 1-in-6 day schedule and measure lead concentrations by analyzing the filters from the low volume PM₁₀ monitors that operate at the site. The samples will be analyzed in batches of 50-80 using x-ray fluorescence, which is the Federal Reference Method for the low-volume PM₁₀ lead monitoring method.



Legend

■ required Pb monitoring

Figure 63. Location of Required Population-Exposure Lead Monitors in North Carolina

The locations of the required PM₁₀ lead-monitoring sites are provided in Table 36. All monitors listed in Table 36 are suitable for determining a violation of the National Ambient Air Quality Standards (NAAQS). Both of the monitors meet the requirements

of Appendices A, C, D and E of 40CFR58 after the Quality Assurance Project Plan and Standard Operating Procedures are submitted to the EPA and the procedures are approved by the EPA. Both of these monitors use the U.S. EPA reference method designations RFPS-1298-127 and RFLQ-1108-804.

Table 37 provides the monitor type, operating schedules, monitoring objectives, scales and statement of purpose for all of the required monitors in the North Carolina PM₁₀ Lead Monitoring Network. Both monitors operate on a 24-hour schedule from midnight to midnight on each scheduled sampling day. Both of the monitors operate year-round. Table 38 summarizes the status for each required monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in 40 CFR58 Appendices A, C, D and E and also provides the proposed changes to the network.

Table 36 North Carolina Lead Monitoring Network – Monitor Locations ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	W 080 46' 59"	N 35 14' 28"	Charlotte-Concord-Gastonia
Raleigh Metropolitan Statistical Area						
AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	W 078 34' 27"	N 35 51' 22"	Raleigh

^a All monitors use an R & P Model 2025 PM_{2.5} Sequential Monitor with a PM₁₀ down tube (Air Quality System (AQS) Method Code 811). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58. All monitors use the U.S. EPA reference method designations RFPS-1298-127 and RFLQ-1108-804.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

Table 37 Statement of Purpose for North Carolina Lead Monitoring Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371190041 ^c	Garinger	NCORE	1-in-6 day ^c	1 of 2 Required Population Exposure Monitors in North Carolina. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule ^b	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	NCORE	1-in-6 day	1 of 2 Required Population Exposure Monitors in North Carolina. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood

^a All monitors use an R & P Model 2025 PM2.5 Sequential Monitor with a PM₁₀ down tube (Air Quality System (AQS) Method Code 811) All monitors in this table meet the requirements of Appendices A, C and E of Part 58. All monitors use the U.S. EPA reference method designations RFPS-1298-127 and RFLQ-1108-804.

^b All monitors operate on a 24-hour schedule, collecting a sample from midnight to midnight, Eastern Standard Time.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669).

Table 38 Status of North Carolina Lead Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
371190041 ^c	Garinger	Yes	Yes- 1 of 2 Required Monitors for North Carolina.	None

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^b	Proposal to Move or Change
			D	
371830014	Millbrook	Yes	Yes - 1 of 2 Required Monitors for North Carolina.	None

^a All monitors use an R & P Model 2025 PM2.5 Sequential Monitor with a PM₁₀ down tube (Air Quality System (AQS) Method Code 811).

^b All monitors meet the requirements of Appendix A to 40CFR58. The Quality Assurance Project Plan and Standard Operating Procedures are being written to reflect the new PM₁₀ lead method established by the EPA. All monitors use the U.S. EPA reference method designations RFPS-1298-127 and RFLQ-1108-804. All monitors meet the requirements of Appendix E of 40CFR58.

^c Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

IX. Urban Air Toxics Monitoring Network

Monitoring for Urban Air Toxics (UAT) is currently conducted in North Carolina by the North Carolina Division of Air Quality (NC-DAQ) at four sites operated by the NC-DAQ and at three sites operated by local programs. Currently, the NC-DAQ collects whole air samples in stainless steel 6 liter- pressurized canisters at all seven sites. The samples are then analyzed using cryogenic pre-concentration gas chromatography with mass spectrometric detection (GC/MS) via the Compendium Method for Toxic Organics (TO) 15 for the list of 68 compounds shown in Table 39.

Table 39 List of Urban Air Toxic Compounds Measured in North Carolina

Propene	Hexane	1,1,2-Trichloroethane (vinyl trichloride)
Freon 12	Methacrolein	Ethylpropylketone
Freon 22	Vinyl Acetate	Tetrachloroethylene (perchloroethylene)
Freon 114	1,1-Dichloroethane	Methyl Butyl Ketone
Chloro Methane (Methylchloride)	Methyl Vinyl Ketone	Dibromoethane
Isobutene	Methyl Ethyl Ketone	Chlorobenzene (phenylchloride)
Vinyl chloride	1,2 Dichloroethene	Ethylbenzene
1,3-Butadiene	Chloroform	m- & p-Xylene
Bromomethane	1,1,1-Trichloroethane (Methyl chloroform)	o-Xylene
Chloroethane	Cyclohexane	Styrene
Freon 11	Carbon Tetrachloride	Bromoform
Pentane	Benzene	1,1,2,2-Tetrachloroethane
Ethanol	1,2-Dichloroethane (ethylene dichloride)	1,3,5-Trimethylbenzene (mesitylene)
Isoprene	1-Butanol	1,2,4-Trimethylbenzene (pseudocumene)
Acrolein	Trichloroethylene	m-Dichlorobenzene
1,1-Dichloroethene (Vinylidene chloride)	2-Pentanone	1,2,3-Trimethylbenzene
Freon 113	3-Pentanone	p-Dichlorobenzene
Methyl Iodide	1,2-Dichloropropane	Benzylchloride
Isopropyl Alcohol	1,4-Dioxane	o-Dichlorobenzene
Carbon Disulfide	Bromodichloromethane	1,2,4-Trichlorobenzene
Acetonitrile	trans-1,3 Dichloropropene	
Methylene chloride	Methyl Isobutyl Ketone	
Cyclopentane	Toluene	
MTBE	cis-1,3 Dichloropropene	

The NC-DAQ established and operates an urban air toxics monitoring network in conjunction with a national program originally proposed and designed by the EPA in 1999. The NC-DAQ recognizes the importance of this network and supports the continuation of the program. Currently, the North Carolina program has six urban sites and one rural site. The objectives of the network proposed by the EPA in 1999 were stated as follows:

1. Measure pollutants of concern to the air toxics program;

2. Use scientifically sound monitoring protocols to ensure nationally consistent data of high quality;
3. Collect a sufficient amount of data to estimate annual average concentrations;
4. Complement existing national and State/local monitoring programs;
5. Reflect “community-oriented” (i.e. neighborhood-scale) population exposure; and
6. Represent geographic variability in annual average ambient concentrations.

The North Carolina network was developed with these objectives in mind to focus on the urban areas within the State and to work in collaboration with the three local air quality agencies that regulate air quality programs in the metropolitan areas within their respective jurisdiction. The network should complement the air toxics programs of each agency and provide a “flexible approach” to address air toxics issues in the local areas and to provide a framework to conduct more dedicated monitoring to characterize the spatial concentration patterns of specific toxic air pollutants within an urban area and to concentrate on problem areas.

The number of monitoring sites was chosen based on available funds, equipment and personnel including those in local programs and regional offices. The locations were chosen based on size of metropolitan statistical areas (MSA) in NC, existing sites in urban areas and support of local programs. The sites selected for the NC UAT network were established in predominately urban areas as designated by the US Census Bureau, 2000 Census. An “urban” area has been defined by EPA as a county with either a MSA population of at least 250,000 or in a county with at least 50 percent urbanization as described by the Census. A “Rural” county is defined as a county that has less than 50 percent urbanization as designated by the Census.

Because there are no National Ambient Air Quality Standards (NAAQS) for UAT, the Environmental Protection Agency (EPA) does not require the NC-DAQ and the local programs to operate a minimum number of required monitors.

The NC-DAQ has made the following changes during the last few years to the UAT monitoring network. The Research Triangle Park (RTP) site shared with EPA was closed because EPA was forced to close and move the building for a major road project. When EPA re-established the site a safe distance from the road construction, a decision was made to seek other possibly better located sites for the UAT monitoring that might be more representative of urban populations in NC. Adding one or two sites in urban areas not currently monitored is being considered. At all NC UAT sites monitoring has been discontinued for Semi-Volatile Organic Compounds (SVOCs) and carbonyl compounds by methods TO-13 and TO-11, respectively. However, sampling for carbonyl compounds by TO-11 resumed in July 2013 at two sites – Millbrook in Raleigh and Candor and started at the new Blackstone site in November 2013. One GC/MS system used for Volatile Organic Compound (VOC) analysis by method TO-15 has been upgraded to lower detection limits especially for acrolein. No special studies are on-going or anticipated at this time.

The locations of the current air toxic-monitoring sites are provided in Table 40. Sometime in the future the NC-DAQ may add a VOC monitoring site in Greensboro,

Durham or Greenville. Because a specific location has not yet been identified, the proposed site is not included in the table. All of the monitors meet the requirements of Appendices A and E of 40CFR58. Appendix C and D requirements do not apply to air toxics monitoring. All of the monitors are non-regulatory because there are no NAAQS for toxic compounds.

Table 41 provides the monitor type, operating schedules, monitoring objectives, scales and statement of purpose for all of the current monitors in the NC UAT Monitoring Network. All of the monitors operate year-round. Table 42 summarizes the status for each current monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in Appendices A, C, D and E of 40CFR58 and also provides the proposed changes to the existing network.

Table 40 NC UAT Monitoring Network – Monitor Locations

Charlotte-Concord-Gastonia Metropolitan Statistical Area						
AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371190041 ^a	Garinger High School	1130 Eastway Drive	Charlotte	-80.785683	35.240100	Charlotte-Concord-Gastonia
Raleigh Metropolitan Statistical Area						
AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	-78.574167	35.856111	Raleigh
Winston-Salem Metropolitan Statistical Area						
AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370670022 ^b	Hattie Avenue	Corner of 13 th & Hattie Avenue	Winston-Salem	-80.226667	36.110556	Winston-Salem
Asheville Metropolitan Statistical Area						
AQS Site Id Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370210035 ^c	AB Tech	AB Tech College	Asheville	82.558611	35.572222	Asheville
Wilmington Metropolitan Statistical Area						
AQS Site ID Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371290010	Battleship Site	Battleship Drive	Wilmington	77.955833	34.235556	Wilmington
Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites						
AQS Site ID Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371050002	Blackstone	4110 Blackstone Drive	Sanford	-79.288700	35.432500	Sanford
371230001	Candor	112 Perry Drive	Candor	-79.836613	35.262490	None

^a Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^b Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^c Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

Table 41 Statement of Purpose for NC UAT Monitoring Network

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371190041 ^a	Garinger	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible.	Population Exposure	Neighborhood

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible.	Population Exposure General/ Background	Neighborhood

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370670022 ^b	Hattie Avenue	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible	Population Exposure	Neighborhood

Asheville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370210035 ^c	AB Tech	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible	Population Exposure	Neighborhood

Wilmington Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371290010	Battleship Site	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible.	Population Exposure	Neighborhood

Not in a Metropolitan Statistical Area – Valley, Piedmont, Coastal Sites

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371050002	Blackstone	Special Purpose	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible	General/ Background	Urban
371230001	Candor	Non-regulatory	24-hour, midnight to midnight, 1 in 6 day	Monitor as many HAPs as possible	General/ Background	Regional

^a Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^b Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^c Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

Table 42 Status of NC UAT Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
371190041 ^c	Garinger	Yes	Not Applicable – Uses AQS Method Code 150 ^d	Not Applicable	None

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
371830014	Millbrook	Yes	Not Applicable – Uses AQS Method Code 150 and 202 ^d	Not Applicable	Carbonyl sampler added 7/3/2013

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
370670022 ^e	Hattie Avenue	Yes	Not Applicable – Uses AQS Method Code 150 ^d	Not Applicable	None

Asheville Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
370210035 ^f	AB Tech	Yes	Not Applicable – Uses AQS Method Code 150 ^d	Not Applicable	None

Wilmington Metropolitan Statistical Area

AQS Site Identification Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
371290010	Battleship Site	Yes	Not Applicable – Uses AQS Method Code 150 ^d	Not Applicable	None

Not in a Metropolitan Statistical Area – Valley, Piedmont and Coastal Sites

AQS Site Id Number	Site Name	Meets Requirements of Part 58 Appendices ^b			Proposal to Move or Change
		A	C	D	
371050002	Blackstone	Yes	Not Applicable – Uses AQS Method Code 150 and 202 ^d	Not Applicable	VOC sampling started 11/6/13 and Carbonyl sampling started 11/12/13
371230001	Candor	Yes	Not Applicable – Uses AQS Method Code 150 and 202 ^d	Not Applicable	Carbonyl sampler added 7/3/2013

^a There is no NAAQS for air toxics so none of the monitors provide data suitable for comparing to the NAAQS.

^b All monitors meet the requirements of Appendix E of 40CFR58.

^c Operated by Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^d AQS Method Code 150 (sample collection in a stainless steel 6 liter- pressurized canister and analysis using cryogenic pre-concentration gas chromatography with mass spectrometric detection) for VOCs and 202 (sample collection on a Silica-DNPH-Cartridge with KI O3 Scrubber and analysis using HPLC Ultraviolet Absorption) for carbonyls.

All monitors meet the requirements of Appendix E of 40CFR58.

^e Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403)

^f Operated by the Western North Carolina Regional Air Quality Agency (AQS Reporting Agency 0779).

X. NC-DAQ NCore Monitoring Network

This section provides information on the North Carolina Division of Air Quality National Core (NCore) monitoring network. For information on the NCore site operated by Mecklenburg County Air Quality, see Appendix B. 2014 Annual Monitoring Network Plan for Mecklenburg County Air Quality.

A. Overview

The NCore site operated by the NC-DAQ is located at the East Millbrook Middle School site. Specifics for this site are provided below.

<u>Parameter</u>	<u>Description</u>
A) AQS identification number	37-183-0014
B) Site Name	Millbrook
C) Address	3801 Spring Forest Road, Raleigh, N.C.
D) Longitude/Latitude	-78.574167/ 35.856111 decimal degrees
E) Scale of Representation	Neighborhood
F) Monitoring Objective	Population Oriented
G) Proximity to Local Emissions	None within 500 meters
H) MSA Description	Raleigh
I) Land Use	Urban

The NC-DAQ has been operating monitors at this site since September 16, 1998 and has no plans to relocate this site. The site is located at a school and the school has been very cooperative in allowing NC-DAQ to make necessary changes at the site so that the site will meet 40 CFR 58 Appendix E requirements. The school property is fully developed and the NC-DAQ does not anticipate that the Wake County School System will need to develop the area where the monitoring site is located or will evict us from their property anytime in the next 18 months or later.

B. Monitor Siting Considerations

This site was modified as necessary to meet the entire EPA monitor siting criteria in 40 CFR 58 Appendix E. The following issues were addressed:

- 1) Trees were removed or trimmed such that all probe inlets are > 10 meters from any tree drip line.
- 2) All particulate matter monitors (filter based and continuous) are located on a 16'x16' wooden deck constructed in 2009. All inlets are within 1-4 meters of each other, all inlets are within 1 meter vertically of each other, all inlets are between 2 and 15 meters above ground and all inlets are more than 20 meters from any roadway.

- 3) All continuous gaseous monitors (SO₂, NO_y, CO and O₃) are housed in a temperature controlled walk-in shelter, which meets all of the EPA siting criteria.

With the changes made to the monitoring site by removing the trees and building the deck, the site is suitable for monitoring for fine particles for the purpose of comparing the measured concentrations to the National Ambient Air Quality Standards. The platform is far enough from the road so that the site will meet the necessary neighborhood scale requirements for population oriented monitoring.

C. Monitors/Methods

This NCore site has the following monitors in place and operating since January 1, 2011, or before, except for lead, which began December 27, 2011 and nitrogen dioxide (NO₂), which began December 10, 2013:

Parameter	Monitoring Objective	Scale of Representation	Operating Schedule	AQS Method Code
Trace Level Sulfur Dioxide (SO ₂)	Population Exposure	Neighborhood	Hourly data year round	560
Trace Level Carbon Monoxide (CO)	Population Exposure	Neighborhood	Hourly data year round	554
Trace level Reactive oxides of Nitrogen (NO _y)	Population Exposure	Neighborhood	Hourly data year round	574
Nitrogen Dioxide (NO ₂)	Population Exposure	Neighborhood	Hourly data year round	599
Ozone (O ₃)	Population Exposure	Neighborhood	Hourly data year round	047
PM _{2.5} (fine PM), filter based	Population Exposure	Neighborhood	24-hour data on a 1-in-3 day schedule year round	118
PM _{2.5} (fine PM), continuous	Population Exposure	Neighborhood	Hourly data year round	170
Speciated PM _{2.5} , filter based	Population Exposure	Neighborhood	24-hour data on a 1-in-3 day schedule year round	810-812, 838-842
PM ₁₀ , filter based low volume sampler	Population Exposure	Neighborhood	24-hour data on a 1-in-3 day schedule year round	127

Parameter	Monitoring Objective	Scale of Representation	Operating Schedule	AQS Method Code
PM _{10-2.5} (coarse PM), by difference, PM ₁₀ -PM _{2.5}	Population Exposure	Neighborhood	24-hour data on a 1-in-3 day schedule year round	176
PM ₁₀ Lead, filter-based low volume sampler	Population Exposure	Neighborhood	24-hour data on a 1-in-6 day schedule year round	127
Meteorological measurements of:				
Wind speed	Population Exposure	Neighborhood	Hourly data year round	020
Wind direction	Population Exposure	Neighborhood	Hourly data year round	020
Relative humidity	Population Exposure	Neighborhood	Hourly data year round	020
Ambient temperature	Population Exposure	Neighborhood	Hourly data year round	020

The monitor regulations were modified in 2012 to remove the requirement that all NCore sites monitor for Speciated PM_{10-2.5} (course PM) Filter based. The NC-DAQ has no plans to add a Speciated PM_{10-2.5} monitor to the site.

D. Readiness Preparation

In preparation for the installation of the NCore monitors, the following tasks were addressed:

<u>Parameter</u>	<u>Status</u>
A) Acquisition of trace level gaseous monitors	Completed
B) Acquisition of low concentration gas dilution calibrators	Completed
C) Certification of clean air generators	Completed
D) Method Detection Limit studies for trace level monitors	Completed
E) Installation of 10 meter NO _y Tower	Completed
F) Installation of filter based and continuous PM monitors	Completed
G) Installation of trace level gaseous monitors	Completed
H) Preparation of trace level gaseous monitor QAP/SOPs	Completed
I) Meteorological tower	existing
J) Ozone monitor	existing

E. Waiver Requests

Subject to the review of the administrator, NC-DAQ requested and received the following waivers from the specific minimum requirements for NCore sites. The EPA approval letter is provided in Appendix E. 2011 Network Plan EPA Approval Letter.

1. Millbrook Meteorological Tower

The sampling site located at the Millbrook Middle School has been designated as an EPA NCore site. In addition to specified monitor types, the collection of meteorological data is also required and includes, at a minimum, wind speed, wind direction, relative humidity and ambient temperature. The Millbrook site has been in operation since 1989 and the meteorological tower has the required sensors in place.

The tower is located approximately due south and 15.5 meters from the shelters that house the various monitors (see Figure 64). The wind direction/speed sensors are located at a height of 10 meters above ground and the relative humidity sensor is located at 2 meters. Ambient temperature sensors (2) are located at 2 meters and 10 meters above ground. The tower is located in an open, grassy area that is free from any obstructions in a 270° arc to the prevailing winds that come from the South/West direction. The tower is positioned 15.5 meters from the shelters on a 3% uphill grade. This grade adds approximately 1 meter to the height of the tower above the shelters. This siting does not meet the EPA requirement for the tower being a distance of 10 times the height of the shelter (3.7 meters). Additionally, a single tree, approximately 7 meters tall, is located 18 meters to the South/East of the tower.



Figure 64. Millbrook NCore Site

Since the position of the meteorological tower is free from any obstructions in a 270° arc to the prevailing winds that come from the South/West direction, the State of North Carolina is confident that the measurements provided will be representative of meteorological conditions in the area of interest. The State, therefore, requested and the EPA granted a waiver and deemed the position of the tower to be acceptable.

2. *NO_y probe inlet placement*

NCore probe siting guidance for NO_y is a suggested probe inlet height of 10 meters. The NO_y probe inlet is currently mounted at a height of 5.08 meters from the ground at the proposed NCore site. NC-DAQ requested and received a waiver of the 10 meter probe height requirement primarily for safety considerations and also to facilitate maintenance on the sampling inlet (cleaning of the cross fitting) and to provide access for performance of calibration test points under reduced multi-gas calibrator system pressures (near ambient conditions).

The monitoring site is located at a middle school and temporary elementary school and next to a day care. The converter box for the NO_y monitor is very heavy and requires a special tower to support the weight in winds above 40 miles per hour or a tower with guy wires. Because the tower needs to be located next to the monitoring shelter to minimize the length of tubing involved to transport sample from the converter box to the monitor, there is no space at the site for guy wires to stabilize the tower. The guy wires would block ingress and egress from the monitoring shelter and create a safety hazard for the monitoring technicians. The NC-DAQ believes placing the converter box on a 10-m tower without guy wires at this site would be too dangerous because winds often gust to over 40 miles per hours during thunderstorms, hurricanes and other severe weather events.

The NC-DAQ decided to invest resources installing a new tower at the site because the difference in cost between properly grounding the existing tower and installing a new tower rated to hold the weight of the converter box without guy wires was small compared to the cost of properly ground the tower. Thus, after the new tower was installed in late 2010, the NC-DAQ increased the height of the probe inlet from 5.08 meters to 10 meters.

XI. Nitrogen Dioxide Monitoring Network

The North Carolina Division of Air Quality (NC-DAQ) currently operates two nitrogen dioxide monitors. Mecklenburg County Air Quality also operates two nitrogen dioxide monitors and Forsyth County Office of Environmental Assistance and Protection (FCOEAP) operates one nitrogen dioxide monitor. In 2010 the United States Environmental Protection Agency (EPA) changed the nitrogen dioxide primary National Ambient Air Quality Standard (NAAQS) from an annual to an hourly standard of 100 parts per billion and established a new nitrogen dioxide monitoring network to support the new standard. The new network has three types of monitoring sites:

- Near road sites – micro-scale near-road NO₂ monitoring stations in each Core-Based Statistical Area (CBSA) with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high Average Annual Daily Traffic (AADT) counts.
- Area wide sites – monitoring stations in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales.
- Regional Administrator Required Monitoring – additional NO₂ monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, selected by the Regional Administrators, in collaboration with States, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.

North Carolina has five CBSAs that are larger than 500,000 or more persons and two CBSAs that are larger than 1,000,000 or more persons (not counting Virginia Beach-Norfolk-New Port News). Thus, North Carolina is required to have near road monitoring stations in the Charlotte, Raleigh, Greensboro, Winston-Salem and Durham areas and area wide sites in the Charlotte and Raleigh areas. In addition the site operated by the FCOEAP at Hattie Avenue was selected by the Region 4 Administrator for Regional Administrator Required Monitoring.

A. Near Road Monitoring

For a discussion of the selection of the near road monitoring site in the Charlotte area see Appendix B. 2014 Annual Monitoring Network Plan for Mecklenburg County Air Quality. Site selection for the Raleigh, Greensboro and Durham areas are described in the following subsections.

1. Raleigh Core Based Statistical Area

The United States Environmental Protection Agency (US EPA) approved the Triple Oak Road near road site for the Raleigh Core-Based Statistical Area in 2012. Appendix F. 2012 Network Plan EPA Approval Letter provides the approval letter from the US EPA. For details on the selection of Triple Oak Road and other locations that were considered see the 2012 Annual Monitoring Network Plan for North Carolina Air Quality. Table 43 provides the most recently available traffic information for the area from the NC Department of Transportation. Table 44 provides the most recently available traffic information using the traffic sensor located at the site. Using actual traffic data confirms that the monitor is in the area with the highest traffic.

Table 43. Fleet Equivalent Average Annual Daily Traffic for Selected Road Segments in the Raleigh Metropolitan Statistical Area

Station	Route	Location	Station	Percent Passenger	2012 AADT	Fleet Equivalent AADT
1	I-40	From Exit 287 To 289	09MC0031	94%	163,000	251,020
813	I-40	From Exit 285 To 287	09MC0031	94%	156,000	240,240
807	I-40	From Exit 283 To 284	09MC0031	94%	142,000	218,680
811	I-40	From Exit 284 To 285	09MC0031	94%	137,000	210,980
634	I-40	From Exit 297 To 298	09MC0033	92%	115,000	197,800
889	I-40	From Exit 300 To 301	10MC0021	91%	107,000	193,670
895	US 1-64	W Of I-40	10MC0009	95%	131,000	189,950
169	I-440	From Exit 7 To 8	09MC0048	96%	135,000	183,600

Table 44. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Raleigh Metropolitan Statistical Area Using Microwave Radar Data

Route	Location	2012 Traffic Monitor Data			2013 Traffic Monitor Data		
		Percent Passenger	AADT	Fleet Equivalent AADT	Percent Passenger	AADT	Fleet Equivalent AADT
I-40	Exit 283 to 284	95	139,472	204,387	95 %	140,133	205,797
I-40	Exit 284 to 285	95	131,243	187,654	95 %	133,655	192,580
I-40	Exit 287 to 289	96	128,835	179,734	96 %	130,419	182,003
I-40	Exit 285 to 287	98	140,539	165,949	98 %	141,006	166,657
I-40	Exit 301 to 302	97	110,809	142,482	98 %	137,314	167,224
I-40	Exit 297 to 298	98	113,550	139,757	97 %	114,740	143,302
I-440	Exit 7 to 8	99	126,617	138,168	97 %	111,733	140,247
I-540	Exit 2 to 3	98	79,219	95,844	96 %	83,527	113,511
I-540	Exit 3 to 4	97	64,202	84,822	98 %	101,687	121,505
I-540	Exit 1 to 2	99	70,179	77,719	98 %	70,700	86,299

An aerial view of the location is shown in Figure 65. The monitoring probe is located 18 meters from the edge of I-40 and 4.3 meters above the ground. The monitoring station is approximately 1 kilometer from I-540 and 0.5 kilometers from Airport Boulevard. The Airport Boulevard ramp ends approximately 300 meters southeast from the monitoring site. The location is at grade with the roadway. There are no barriers between the road and the monitoring station.

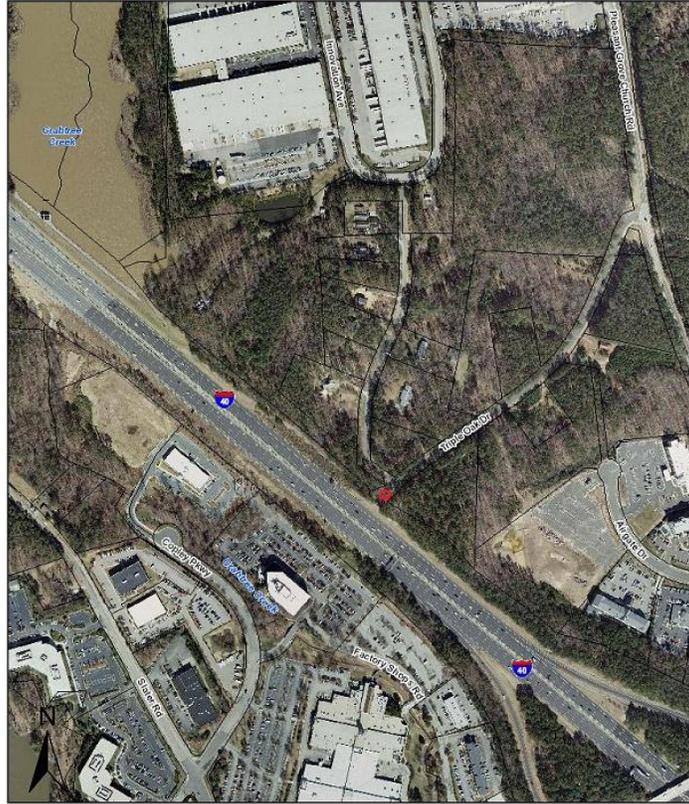


Figure 65 Wake County Near-Road Monitoring Station Location (red circle)

2. Greensboro-High Point Core Based Statistical Area

Preliminary analysis of the road segments in the Greensboro-High Point MSA using highest average annual daily traffic values adjusted for fleet mix indicates the monitoring station should be located along Knox Road near Exit 132. The segments in the Greensboro-High Point MSA with the highest average annual daily traffic adjusted for fleet mix are shown in Table 45.

Table 45. Fleet Equivalent Average Annual Daily Traffic for Selected Road Segments in the Greensboro-High Point MSA

Station	Route	Location	Station	Percent Passenger	2012 AADT	Fleet Equivalent AADT
(B)3400	I-85	From Exit 131 To Exit 132	Extrapolate	85%	113,000	265,550
(C)697	I-85	From Exit 132 To Exit 135	Extrapolate	85%	112,000	263,200
(D)811	I-85	From Exit 135 To Exit 138	Extrapolate	85%	110,000	258,500
(E)813	I-85	From Exit 138 To Exit 140	10MC0001	85%	109,000	256,150
(A)340	I-40	From Exit 221 To Exit 222-223	09MC0066	88%	120,000	249,600
(F)341	I-40	From Exit 219-220 To Exit 221	09MC0065	90%	121,000	229,900
(G)508	I-40	From Exit 211 To Exit 212	09MC0023	89%	110,000	218,900
(H)902	I-40	From Exit 206 To Exit 208	09MC0022	88%	104,000	216,320

The locations of these segments are shown with lettered black squares in Figure 67. They stretch from the eastern part of Guilford County to the western part with heaviest fleet adjusted average annual daily traffic being from central Greensboro going east toward Burlington. At this time, the NC-DAQ is considering placing the monitor along Knox Road by exit 132 on I-85 (Square B). This location is desirable because it is the segment with the highest fleet adjusted average annual daily traffic and it is easily accessible from Knox Road. This monitoring station is not required to start monitoring until January 1, 2017.

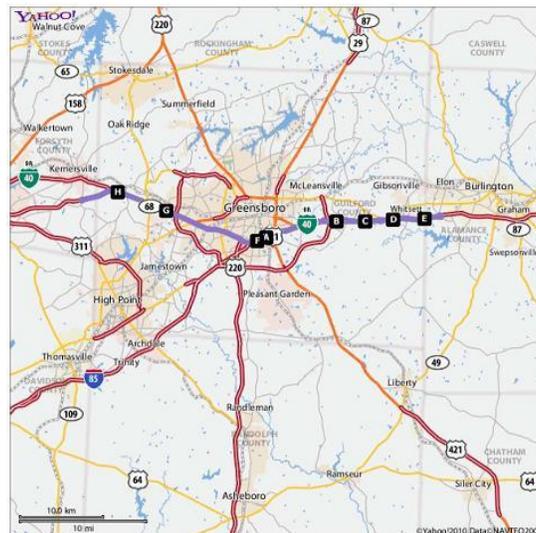


Figure B66. Possible Locations of Future Greensboro Near-Roadway Nitrogen Dioxide Monitoring Sites

The United States Environmental Protection Agency revised the regulation to require near road monitors in MSAs with less than one million people to start operating on January 1, 2017. The NC-DAQ will do a more thorough analysis of road segments in the Greensboro-High Point MSA using 2014 traffic data to determine the best location for the monitoring station in 2017. At that time the NC-DAQ will also evaluate any potential sites based on congestion patterns, roadway design, terrain and meteorology.

3. *Durham-Chapel Hill Core Based Statistical Area*

Preliminary analysis of the road segments in the Durham-Chapel Hill MSA using highest average annual daily traffic values adjusted for fleet mix indicates the monitoring station should be located near the Page Road exit along I-40. The segments in the Durham-Chapel Hill MSA with the highest average annual daily traffic adjusted for fleet mix are shown in Table 46 and Table 47.

Table 46. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Published NCDOT Data

Station	Route	Location	Station	Percent Passenger	2012 AADT	Fleet Equivalent AADT
(A)1011	I-40	From Exit 282 To Exit 283	09MC0030	90%	170,000	323,000
(B)947	I-40	From Exit 281 To Exit 282	09MC0030	90%	164,000	311,600
(C)547	I-40	From Exit 280 To Exit 281	09MC0030	90%	155,000	294,500
(D)553	I-40	From Exit 279 To Exit 280	10MC0005	94%	150,000	231,000
(E)942	I-40	From Exit 273 To Exit 274	09MC0028	90%	113,000	214,700
(F)727	I-40	From Exit 278 To Exit 279	10MC0005	94%	125,000	192,500
(G)6	I-85	From Exit 160 To Exit 161	09MC0069	88%	92,000	191,360
(H)940	I-40	From Exit 276 To Exit 278	10MC0005	94%	121,000	186,340
(I)91	I-85	From Exit 161 To Exit 163	09MC0069	88%	88,000	183,040
(J)5	I-85	From Exit 157 To Exit 160	09MC0069	88%	88,000	183,040

Table 47. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Microwave Radar Data

Route	Location	2012 Traffic Monitor Data			2013 Traffic Monitor Data		
		Percent Passenger	AADT	Fleet Equivalent AADT	Percent Passenger	AADT	Fleet Equivalent AADT
(B)I-40	Exit 281 to 282	95	144,856	216,305	95 %	157,673	235,806
(C)I-40	Exit 280 to 281	97	143,681	180,992	97 %	147,546	185,472
(D)I-40	Exit 279 to 280	98	133,792	163,368	97 %	127,371	167,573
(F)I-40	Exit 278 to 279	97	113,741	149,539	98 %	137,314	167,224
(H)I-40	Exit 276 to 278	97	113,225	142,033	97 %	114,740	143,302
(E)I-40	Exit 273 to 274	97	111,019	139,050	97 %	111,733	140,247
(K)I-40	Exit 274 to 276	98	102,871	123,164	98 %	101,687	121,505
(L)I-40	Exit 270 to 273	96	81,666	110,789	96 %	83,527	113,511

The locations of these segments are shown with lettered symbols in Figure 67. They stretch from the eastern part of Durham County into central Orange County with heaviest fleet adjusted average annual daily traffic being along I-40 near the Durham-Wake County line. Because the highest ranked sites are within two miles of the Raleigh near road monitoring site off of Triple Oak Road along I-40 between Exit 283 and Exit 284 and have similar traffic counts and heavy duty vehicle make-up, the NC-DAQ plans to request a waiver for the near road Durham-Chapel Hill monitoring site.

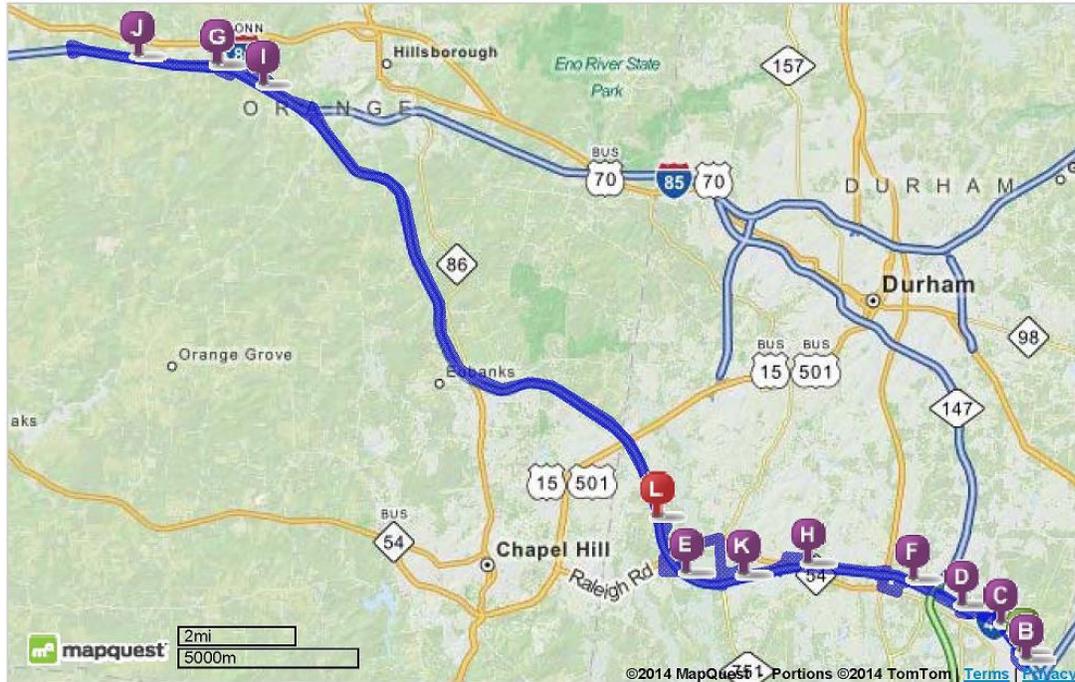


Figure 67. Locations of Segments with Highest Fleet Adjusted AADT in the Durham-Chapel Hill MSA

The United States Environmental Protection Agency revised the regulation to require near road monitors in MSAs with less than one million people to start operating on January 1, 2017. Thus, if the EPA does not provide a waiver for this monitoring site, the NC-DAQ will do a more thorough analysis of road segments in the Durham-Chapel Hill MSA using 2014 traffic data to determine the best location for the monitoring station in 2017. At that time the NC-DAQ will also evaluate any potential sites based on congestion patterns, roadway design, terrain and meteorology.

B. Area wide sites

The area wide sites are located at the NCore sites in Charlotte and Raleigh. Mecklenburg County Air Quality has operated a nitrogen dioxide monitor at the Garinger NCore site since November 12, 1999. The NC-DAQ began operating a nitrogen dioxide monitor at the Millbrook NCore site in Raleigh on December 10, 2013.

C. Regional Administrator Required Monitoring

For information on the selection of Hattie Avenue as a regional administrator required monitoring site see Appendix C. 2014 Annual Monitoring Network Plan for Forsyth County Office of Environmental Assistance and Protection.

The locations of the required nitrogen dioxide monitoring sites are provided in Table 48. All monitors listed in Table 48 are suitable for determining a violation of the National Ambient Air Quality Standards (NAAQS). All of the monitors either currently or will meet the requirements of Appendices A, C, D and E of 40CFR58 after the Quality Assurance Project Plan and Standard Operating Procedures are submitted to the EPA for new procedures and the procedures are approved by the EPA. All near road monitors and the Raleigh area wide monitor will use a chemiluminescence detector with a photolytic convertor. The Charlotte area wide

monitor uses the U.S. EPA reference method designation RFNA-1289-074 (Air Quality System (AQS) Method Code 074). The Winston-Salem Regional Administrator Required monitor uses the U.S. EPA reference method designation RFNA-1194-099 (Air Quality System (AQS) Method Code 099).

Table 49 provides the monitor type, operating schedules, monitoring objectives, scales and statement of purpose for all of the required monitors in the North Carolina nitrogen dioxide Monitoring Network. All monitors operate on an hourly year-round schedule. Table 50 summarizes the status for each required monitoring site regarding whether it is suitable for comparison to the NAAQS and meets the requirements in 40 CFR58 Appendices A, C, D and E and also provides the proposed changes to the network.

Table 48 North Carolina Nitrogen Dioxide Monitoring Network – Monitor Locations ^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371190041 ^b	Garinger	1130 Eastway Drive	Charlotte	-80.785683	35.240100	Charlotte-Concord-Gastonia
371190044 ^b	Remount Road	902 Remount Road	Charlotte	-80.874401	35.212657	Charlotte-Concord-Gastonia

Raleigh Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
371830014	Millbrook	3801 Spring Forest Road	Raleigh	-78.574167	35.856111	Raleigh
371830021	Triple Oak Road	2826 Triple Oak Road	Cary	-78.8195	35.8654	Raleigh

Greensboro-High Point Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370810015 ^c	Knox Road	Knox Road	Greensboro	-79.6627	36.0598	Greensboro

Winston-Salem Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370670022 ^d	Hattie Ave.	Corner of 13 th & Hattie Avenue	Winston-Salem	-80.226667	36.110556	Winston-Salem
370670031 ^{c, d}	Near Road	To be determined	Winston-Salem	To be determined	To be determined	Winston-Salem

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Identification Number	Site Location					MSA, CSA, or CBSA represented
	Site Name	Street Address	City	Longitude	Latitude	
370630016 ^c	Page Road	Page Road	Durham	-78.8425	35.8858	Durham-Chapel Hill

^a All near road monitors and the Raleigh area wide monitor use a chemiluminescence detector with a photolytic convertor. The Charlotte area wide monitor uses the U.S. EPA reference method designation RFNA-1289-074 (Air Quality System (AQS) Method Code 074). The Winston-Salem Regional Administrator Required monitor uses the U.S. EPA reference method designation RFNA-1194-099 (Air Quality System (AQS) Method Code 099). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c This monitor will start in 2017.

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

Table 49 Statement of Purpose for the North Carolina Nitrogen Dioxide Monitoring Network^a

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371190041 ^b	Garinger	SLAMS	Hourly	Area Wide site in Charlotte-Concord-Gastonia MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371190044 ^b	Remount Rd	SLAMS	Hourly	Near Road monitoring site. AQI Reporting. Compliance w/NAAQS.	Source Oriented	Micro-scale

Raleigh Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
371830014	Millbrook	SLAMS	Hourly	Area Wide site in Raleigh MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
371830021	Triple Oak Road	SLAMS	Hourly	Near Road monitoring site. AQI Reporting. Compliance w/NAAQS.	Source Oriented	Micro-scale

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370810015 ^c	Knox Road	SLAMS	Hourly	Near Road monitoring site. AQI Reporting. Compliance w/NAAQS.	Source Oriented	Micro-scale

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370670022 ^d	Hattie Ave.	SLAMS	Hourly	Regional Administrator required monitor for the Winston-Salem MSA. AQI Reporting. Compliance w/NAAQS.	Population Exposure	Neighborhood
370670031 ^{c, d}	Near Road	SLAMS	Hourly	Near Road monitoring site. AQI Reporting. Compliance w/NAAQS.	Source Oriented	Micro-scale

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Monitor Type	Operating Schedule	Statement of Purpose	Monitoring Objective	Scale
370630016 ^c	Page Road	SLAMS	Hourly	Near Road monitoring site. AQI Reporting. Compliance w/NAAQS.	Source Oriented	Micro-scale

^a All near road monitors and the Raleigh area wide monitor use a chemiluminescence detector with a photolytic convertor. The Charlotte area wide monitor uses the U.S. EPA reference method designation RFNA-1289-074 (Air Quality System (AQS) Method Code 074). The Winston-Salem Regional Administrator Required monitor uses the U.S. EPA reference method designation RFNA-1194-099 (Air Quality System (AQS) Method Code 099). All monitors listed in this table are suitable for comparison to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c This monitor will start in 2017.

^d Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

Table 50 Status of North Carolina Nitrogen Dioxide Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

Charlotte-Concord-Gastonia Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371190041 ^b	Garinger	Yes	Yes – AQS Method Code 074	Yes- Required Area Wide Monitor for the Charlotte-Concord-Gastonia MSA.	None
371190044 ^b	Remount Rd	Yes	Yes – AQS Method Code 599	Yes- Required Near Road Monitor for the Charlotte-Concord-Gastonia MSA.	Monitor up and operational 6/1/2014

Raleigh Metropolitan Statistical Area

AQS Site ID Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
371830014	Millbrook	Yes	Yes – AQS Method Code 599	Yes- Required Area Wide Monitor for the Raleigh MSA.	Monitor up and operational 12/10/2013
371830021	Triple Oak Road	Yes	Yes – AQS Method Code 599	Yes- Required Near Road Monitor for the Raleigh MSA.	Monitor up and operational 1/8/2014

Greensboro-High Point Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370810015	Knox Road	Yes	Yes – AQS Method Code 599	Yes- Required Near Road Monitor for the Greensboro-High Point MSA.	Monitor will be up and operational by 1/1/2017

Winston-Salem Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370670022 ^c	Hattie Ave.	Yes	Yes – AQS Method Code 099	Yes – Required Regional Administrator monitor.	None
370670031 ^c	Near Road	Yes	Yes – AQS Method Code 099	Yes- Required Near Road Monitor for the Winston-Salem MSA.	Monitor will be up and operational by 1/1/2017

Durham-Chapel Hill Metropolitan Statistical Area

AQS Site Id Number	Site Name	Suitable for Comparison to NAAQS	Meets Requirements of Part 58 Appendices ^a		Proposal to Move or Change
			C	D	
370630016	Page Road	Yes	Yes – AQS Method Code 599	Yes – Required Near Road Monitor for the Durham-Chapel Hill MSA	Monitor will be up and operational by 1/1/2017

^a All near road monitors and the Raleigh area wide monitor will use a chemiluminescence detector with a photolytic convertor. The Charlotte area wide monitor uses the U.S. EPA reference method designation RFNA-1289-074 (Air Quality System (AQS) Method Code 074). The Winston-Salem Regional Administrator Required monitor uses the U.S. EPA reference method designation RFNA-1194-099 (Air Quality System (AQS) Method Code 099). All monitors listed in this table are suitable for comparison

Table 50 Status of North Carolina Nitrogen Dioxide Monitoring Network in Meeting the Requirements of Part 58 and Proposed Changes to the Network

to the National Ambient Air Quality Standards. All monitors in this table meet the requirements of Appendices A, C, D and E of 40CFR58.

^b Operated by the Mecklenburg County Air Quality (AQS Reporting Agency 0669)

^c Operated by the Forsyth County Office of Environmental Assistance and Protection (AQS Reporting Agency 0403).

XII. EPA Approval Dates for Quality Management Plan and Quality Assurance Project Plans

The dates that the Environmental Protection Agency approved the Quality Management Plan and Quality Assurance Project Plans for the North Carolina Division of Air Quality are provided in Table 51.

Table 51. Dates the EPA Approved the Quality Management Plan and Quality Assurance Project Plans

Document	Date Approved by EPA
Quality Management Plan	August 18, 2011
Quality Assurance Project Plan for PM 2.5 Monitoring	January 16, 2002
Quality Assurance Project Plan for Criteria Pollutant Monitoring	November 6, 2006
Quality Assurance Project Plan for NCore Monitoring	(submitted October 12, 2010)

The North Carolina Division of Air Quality is currently in the process of revising the PM 2.5 and Criteria Monitoring Plans and may combine them into one document.

Concurrence and Approvals

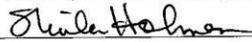
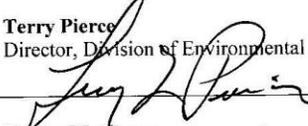
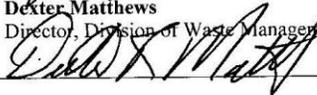
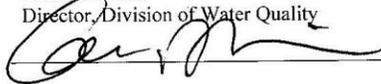
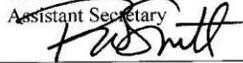
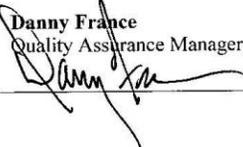
(1)	Name	Sheila Holman	Phone	(919) 733-3340
	Title	Director, Division of Air Quality		
	Signature		Date	6-13-11
(2)	Name	Terry Pierce	Phone	(919) 733-0711
	Title	Director, Division of Environmental Health		
	Signature		Date	06/15/11
(3)	Name	Dexter Matthews	Phone	(919) 508-8414
	Title	Director, Division of Waste Management		
	Signature		Date	6-7-11
(4)	Name	Coleen Sullins	Phone	(919) 807-6300
	Title	Director, Division of Water Quality		
	Signature		Date	6/23/11
<u>Approval for Departmental Implementation</u>				
(8)	Name	Robin Smith	Phone	(919) 715-4141
	Title	Assistant Secretary		
	Signature		Date	7/15/11
(9)	Name	Dee Freeman	Phone	(919) 733-4984
	Title	Secretary, Department of Environment and Natural Resources		
	Signature		Date	7.15.11
<u>Approval for Environmental Protection Agency</u>				
(10)	Name	Danny France	Phone	(706) 355-8738
	Title	Quality Assurance Manager, EPA Region 4		
	Signature		Date	8/18/11

Figure 68. Signature Page from the DENR Quality Management Plan



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

Science and Ecosystems Support Division
980 Orling Station Road
Athens, Georgia 30605 2720



JAN 15 2002

Mr. Hoko P. Kimball, Chief
NCDENR
Division Of Air Quality
Ambient Monitoring Section
1641 Mail Service Center
Raleigh, North Carolina 27699-1641
Project No. 02-0225

Dear Mr. Kimball:

We have received your letter dated December 11, 2001, requesting EPA approval, and transmitting the Quality Assurance Project Plan (QAPjP): the PM_{2.5} Speciation QA Plan, Section I, Electronic Calibrations Branch Responsibilities and Section II, Operator Responsibilities; as well as the signed Identification and Approval, Section 1.0 Title Page.

In accordance with your request, EPA Region 4 hereby approve these additions to the NC-DAQ PM_{2.5} QAPjP and has enclosed the signed QAPjP Identification and Approval sheet. Should you or your staff have any question(s), please give Herbert Barden a call at 706) 355-8737.

Sincerely,

Gary Bennett
Office of Quality Assurance and
Data Integration

cc: Ed Carreras
Herbert Barden



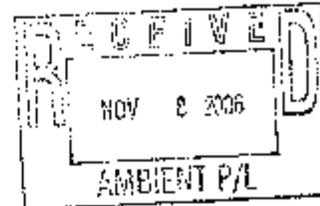
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

(Brook copied 11/13)

REGION 4

Science and Ecosystem Support Division
888 College Station Road
Athens, Georgia 30605-2720

NOV 6 8 2006



Mr. Duke P. Kimball
NC Department of Environment, Health,
And Natural Resources,
1641 Mail Service Center
Raleigh, NC 27699-1641

SESD Project #07 0065

Dear Mr. Kimball:

We have reviewed the Criteria Pollutants Quality Assurance Project Plan (QAPP) for the North Carolina Division of Air Quality ambient air monitoring program. This QAPP is:

- **Quality Assurance Project Plan for the North Carolina Division of Air Quality Ambient Air Quality Monitoring Program, Revision 0, dated September 30, 2006.**

EPA hereby approves this QAPP. Enclosed is the signature page of the QAPP which has been signed to indicate Region 4 approval. If you have any questions or comments, please contact Jerry W. Berger at (706) 255-8739.

Sincerely,

Marilyn Thornton, Chief
Office of Quality Assurance and
Data Integration

Enclosure

cc: Doug Nealey
Stephanie Wimpey

From: Redmond, Donnie
Sent: Tuesday, October 12, 2010 8:16 AM
To: Garver.daniel@epa.gov; Sciera.Katherine@epamail.epa.gov
Cc: Steger, Joette
Subject: NCDAQ NCore QAPP
Attachments: NCore QAPP_final 10_08_2010.pdf

Daniel,

Attached for EPA review and approval is NC DAQ's NCore QAPP. This electronic version is our submittal – no hard copy will be mailed unless specifically required.

Our Air Planning Agreement says to submit such changes to you. If you're not the correct contact, please let me know who is.

Thanks,
Donnie

Please note new email address: donnie.redmond@ncdenr.gov

Donnie Redmond, Ambient Monitoring Section Chief
NC DENR, Division of Air Quality
Ambient Monitoring Section
1641 Mail Service Center
Raleigh, NC 27699-1641
Phone: 919-733-1487
Fax: 919-715-7476
www.ncair.org

E-mail correspondence to and from this address may be subject to the
North Carolina Public Records Law and may be disclosed to third parties.

Figure 69. NCore QAPP Submittal Documentation

XIII. Equipment Condition of North Carolina Monitoring Sites

Ozone Monitors Thermo 49C and Calibrators Thermo 49CPS are in good condition. Manufacturer supports this equipment until August 2015. Half of the current inventory will be surplus in May. The remaining inventory will be surplus after the 2014 ozone season. Currently we have 16 sites running C Models. 4 C Model calibrators that were used for audit devices or lab standards will be kept. An additional 3-5 C Model calibrators will be kept as backups and spare parts to the 4 audit and standard calibrators.

Ozone Monitors Thermo 49I and Calibrators Thermo 49IPS are new and in good condition. DAQ has acquired 20 each and expects to deploy them to the field in 2014 and 2015. We will have a total of 45 I Model calibrators and 45 I Model monitors by June of 2014. 100% of the ozone sites will be converted to I Models in 2015. Currently we have 16 sites running I Models.

All sites are currently using the Electronics and Calibration Branch (ECB) Zero Air Supply (ZAS). All of these units will be surplus at the end of the 2014 ozone season. We have acquired five Environics Model 7000 zero air generators. These units will be used at the ECB on technicians work benches. We have acquired 60 API Teledyne Model 701 Zero Air Generators (ZAG), delivery is expected by June. All NC-DAQ sites requiring zero air will be converted to the Model 701 ZAG units in 2015.

NCORE site equipment is new and in good condition.

SO₂ monitors Thermo 43C and CO Thermo 48C are in good condition and support until August 2015.

NO_y Thermo 42s and CO Thermo 48s are in poor condition and are no longer used. These monitors were replaced with new monitors, as the manufacturer no longer supports these monitors.

Thermo 146C calibrators used with SO₂, CO and NO_y are in good condition and supported until August 2015.

The NH₃ monitors- Model 17C we own (5), they were bought from 1998 to 2000. Two are in poor condition, the rest are operable and are in fair to good condition, we do stock maintenance parts. They will be supported by Thermo until 2015.

The Nitrate analyzers- Model 8400N we own (2), one operates at Rockwell CSS the other is at Millbrook CSS both are in fair to good condition. Their future is dependent on whether we get the nichrome strips manufactured. They are not supported by any manufacturer. We do annually buy maintenance parts for these.

The Sulfate analyzers- Model 5020c we own (2), one is operating at the Millbrook Continuous Speciation Site (CSS) and is in good condition. The other unit is slated for installation at Rockwell CSS. They will no longer be supported by Thermo after 2015. We do annually buy maintenance parts for these. The Model 5020c SO₄ monitor at the Millbrook CSS was replaced with the new unit in late 2013. The one removed from the Millbrook CSS is on the shelf and needs some parts installed and testing before it can be used.

The Total Suspended Particulate (TSP) and Wedding PM₁₀ monitors are in fair condition and can be maintained by ECB.

PM_{2.5} units as a whole, while showing some age, are in good condition. We are waiting for parts to get more spare units repaired.

URG particulate monitors are in good condition.

The Beta Attenuation Monitor (BAM) equipment is new and in good condition.

The Tapered Element Oscillating Microbalance (TEOM) monitors are in poor condition, no longer supported by the manufacturer and need to be replaced.

Met One SASS 9800 units are in fair condition.

XIV. References

1. Title 40 Code of Federal Regulations Part 58, Ambient Air Quality Surveillance. Part 58 and Part 58 Amended: Federal Register/Vol. 71 No. 200/Tuesday, October 17, 2006/Rules and Regulations.
2. State of North Carolina, Department of Transportation. Traffic Count Information. <http://www.ncdot.org/travel/statemapping/trafficvolumemaps/default.html>. 1500 Mail Service Center, Raleigh, NC, 27699-1500.
3. List of Designated Reference and Equivalent Methods. Issue Date: April 1, 2011. <http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf>. United States Environmental Protection Agency, National Exposure Research Laboratory, Human Exposure & Atmospheric Sciences Division (MD-D205-03), Research Triangle Park, NC 27711.
4. U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population for Counties: April 1, 2010 to July 1, 2012. Available on the worldwide web at <http://www.census.gov/popest/data/counties/totals/2012/CO-EST2012-01.html>.
5. Office of Management and Budget, OMB BULLETIN NO. 13-01: Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas and Combined Statistical Areas and Guidance on Uses of the Delineations of These Areas, February 28, 2013, available on the worldwide web at <http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf>, accessed March 22, 2013.

Appendix A. Summary of Monitoring Sites and Types of Monitors

Table A- 1 Summary of Monitoring Sites and Types of Monitors

Site ID Site Name	CO			SO ₂		NO _v		NO ₂	O ₃	Pb	PM ₁₀		PM _{2.5}			Meteorology			UAT	
	R	H	T	R	T	H	T				M	C	M	C	S	WS/WD	AT/RH	RF/SR		
370010002 Hopedale														E	X		X			
370030005 Taylorsville- Liledoun									X		P									
370110002 Linville Falls									X									X		
370130151 Bayview Ferry				X																
370210030 ^a Bent Creek									X											
370210034 ^a Board of Ed														E	X	E				
370210035 ^a AB Tech College																				VOC
370270003 Lenoir				X					X											
370330001 Cherry Grove									X		X				X		X			
370350004 Hickory Water Tower											E			X	X	E				
370370004 Pittsboro				X					X					E						
370510008 Wade									X											
370510009 Wm Owen											X			X	X		X	X	X	
3705100xx New Golfview					P				P											
370511003 Golfview				E					E											
370570002 Lexington Water Tower														X	X	E				
370590003 Mocksville									E											
370610002 Kenansville												X	X	X						
370630015 Durham Armory				X					X		E	P	X	X		P				
370650099 Leggett									X					X						
370670022 ^b Hattie Ave.				X				X	X			X	X	X	X					VOC

Table A- 1 Summary of Monitoring Sites and Types of Monitors

Site ID Site Name	CO			SO ₂		NO _v		NO ₂	O ₃	Pb	PM ₁₀		PM _{2.5}			Meteorology			UAT
	R	H	T	R	T	H	T				M	C	M	C	S	WS/WD	AT/RH	RF/SR	
370670023 ^b Peters Creek	X											X							
370670028 ^b Shiloh Church									X										
370670030 ^b Clemmons									X				X	X					
370671008 ^b Union Cross									X						X	AT			
370690001 Franklinton									E										
370710016 Grier M. S.											E		E	E		E			
370750001 ^c Joanna Bald									X								X		
370770001 Butner									X										
370810013 Mendenhall									X		X		X	X		X	X	X	
370810014 Colfax													E		E				
370870008 Waynesville E.S.									X										
370870012 Waynesville Recreation Center													X						
370870035 Fry Pan									X										
370870036 Purchase Knob									X										
371010002 West Johnston									X				X						
371050002 Blackstone					P			P	X					X		X	X		VOC Carb
371070004 Lenoir Community College									X						X	X	X		
371090004 Crouse									X										
371110004 East Marion											X		X	X		X			
371170001 Jamesville				X					X				X	X					
371190003 ^d #11 Fire Station											X								

Table A- 1 Summary of Monitoring Sites and Types of Monitors

Site ID Site Name	CO			SO ₂		NO _v		NO ₂	O ₃	Pb	PM ₁₀		PM _{2.5}			Meteorology			UAT
	R	H	T	R	T	H	T				M	C	M	C	S	WS/WD	AT/RH	RF/SR	
371190041 ^d Garinger	X		X		X		X	X	X	X		X	X	X		X	X	X	VOC
371190042 ^d Montclair											X		X	X					
371190043 ^d Oakdale													X						
371190044 Redmont Rd			P					P						P					
371191005 ^d Arrowood									X										
371191009 ^d County Line									X										
371210002 Spruce Pine Hospital													X						
371230001 Candor											X		X	X					VOC Carb
371290002 Castle Hayne									X				X	X					
371290006 New Hanover				X															
371290010 Battleship																			VOC
371450003 Bushy Fork				X					E										
371470006 Pitt Co Ag Cen									X				X						
371550005 Linkhaw													E						
371570099 Bethany				X					X										
371590021 Rockwell					P		X		X				X	X	X	X	P		
371730002 Bryson City				X					X					X		X	X	X	
371790003 Monroe M. S.									X										
371830014 Millbrook			X		X		X	X	X	X			X	X	X	X	X	X	VOC Carb
371830016 Fuquay									X										
371830021 Triple Oak Rd			P					X						P					
371890003 Boone													X	P					
371910005 Dillard													E	E		E			

Table A- 1 Summary of Monitoring Sites and Types of Monitors

Site ID Site Name	CO			SO ₂		NO _y		NO ₂	O ₃	Pb	PM ₁₀		PM _{2.5}			Meteorology			UAT
	R	H	T	R	T	H	T				M	C	M	C	S	WS/WD	AT/RH	RF/SR	
371990004 Mt Mitchell									X										

CO = Carbon Monoxide

SO₂ = Sulfur Dioxide

NO_y = Reactive Oxides of Nitrogen

O₃ = Ozone

Pb = Lead

PM₁₀ = Particles of 10 micrometers or less in aerodynamic diameter

PM_{2.5} = Fine Particles

X = monitor operating at site

E = monitor at site will end

P = monitoring proposed to start at site

R = 48C monitor for CO, 43C monitor for SO₂

H = 48S monitor for CO

T = 48i or Teledyne API (TAPI) 300EU monitor for CO, 43 TLE monitor for SO₂

M = Wedding or GMW 1200 for PM₁₀, 2025 Sequential for PM_{2.5}

C = TEOM or BAM

S = Met One SASS monitor and URG 3000N

WS/WD = Wind speed & direction

AT/RH = air temperature & relative humidity

RF/SR = Rainfall & solar radiation

UAT = Urban Air Toxics

VOC = Volatile Organic Compounds

^a Operated by the Western North Carolina Regional Air Quality Agency

^b Operated by the Forsyth County Office of Environmental Assistance and Protection

^c This monitor is owned by the United States Forest Service and operated by the North Carolina Division of Air Quality

^d Operated by the Mecklenburg County Air Quality

Appendix B. 2014 Annual Monitoring Network Plan for Mecklenburg County Air Quality

Please see the following internet web address:

<http://www.charmeck.org/Departments/LUESA/Air+Quality/Air+Quality+Data/Home.htm>

Appendix C. 2014 Annual Monitoring Network Plan for Forsyth County Office of Environmental Assistance and Protection

Please see the following internet web address:

http://daq.state.nc.us/monitor/monitoring_plan/Forsyth_2011_Plan.pdf

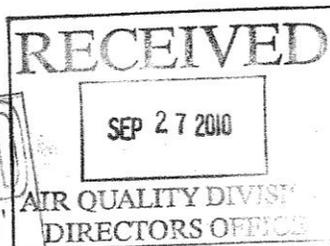
Appendix D. 2010 Network Plan EPA Approval Letter

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

SEP 22 2010



Ms. Sheila C. Holman
Director
Division of Air Quality
North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Ms. Holman/ *Sheila* :

Thank you for submitting the State of North Carolina's 2010 annual ambient air monitoring network plan (Network Plan), dated July 1, 2010. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The Network Plan covers the ambient air monitoring network for the North Carolina Division of Air Quality (NC-DAQ) and its local agencies.

The Environmental Protection Agency (EPA) Region 4 understands that the NC-DAQ provided a 30-day public comment period and received comments from PCS Phosphate Company, Inc. and Mr. Clayton Moore. EPA found that NC-DAQ sufficiently considered and responded to the comments. According to 40 CFR §58.10(a)(2), since public inspection and comment have already been solicited, the EPA Region 4 is not required to offer another comment period.

Based upon our review of the Network Plan, EPA Region 4 has determined that the document satisfies the applicable requirements of 40 CFR Part 58. The Network Plan is approved. Comments and recommendations are enclosed.

Thank you for your work with us to monitor air pollution and promote healthy air quality in North Carolina and the nation. If you have any questions or concerns, please contact Doug Neeley at (404) 562-9097 or Katherine Sciera at (404) 562-9840.

Sincerely,

[Signature]
Gwendolyn Keyes Fleming
Regional Administrator

Enclosure

233

cc: Mr. Donnie Redmond
Supervisor IV, North Carolina Dept. of Air Quality

Mr. Don R. Willard
Director, Mecklenburg County Land Use and Environmental Services Agency

Mr. Robert R. Fulp
Director, Forsyth County Environmental Affairs Department

Mr. David Brigman
Director, Western North Carolina Regional Air Quality Agency

**FY 2010 State of North Carolina Ambient Air Monitoring Network Plan
U.S. EPA Region 4 Comments and Recommendations**

This document contains U.S. EPA Region 4 comments and recommendations to the State of North Carolina's 2010 ambient air monitoring network plan (Network Plan). Ambient air monitoring rules, which include regulatory requirements that address network plans, data certification, and minimum monitoring requirements, among other requirements, are found in 40 CFR Part 58. Minimum monitoring requirements for criteria pollutants are listed in 40 CFR Part 58, Appendix D. Minimum monitoring requirements do not exist for carbon monoxide (CO) unless required by the establishment of a National Core (NCore) multi-pollutant monitoring station, and/or a state implementation plan. However, new national ambient air quality standards (NAAQS) were promulgated this year for nitrogen dioxide (NO₂) and sulfur dioxide (SO₂) with minimum monitoring requirements effective January 1, 2013. Minimum monitoring requirements are listed for ozone (O₃), particulate matter less than 2.5 microns (PM_{2.5}), particulate matter less than 10 microns (PM₁₀), and lead (Pb).

The minimum monitoring requirements are based on metropolitan statistical area (MSA) boundaries as defined by the U.S. Office of Management and Budget (OMB), July 1, 2009, population estimates from the U.S. Census Bureau, and historical ambient air monitoring data. OMB currently defines 15 MSAs in the State of North Carolina. These MSAs and the respective July 1, 2009, population estimates from the U.S. Census Bureau are shown in Table 1.

Table 1: Metropolitan Statistical Areas and Populations

MSA Name	Population
Charlotte-Gastonia-Concord, NC-SC	1,745,524
Virginia Beach-Norfolk-Newport News, VA-NC	1,674,498
Raleigh-Cary, NC	1,125,827
Greensboro-High Point, NC	714,765
Durham-Chapel Hill, NC	501,228
Winston-Salem, NC	484,921
Asheville, NC	412,672
Hickory-Lenoir-Morganton, NC	365,364
Fayetteville, NC	360,355
Wilmington, NC	354,525
Greenville, NC	179,715
Jacksonville, NC	173,064
Burlington, NC	150,358
Rocky Mount, NC	146,536
Goldsboro, NC	113,811

Minimum Ozone Monitoring Requirements
40 CFR Part 58, Appendix D, Table D-2

The network described in the 2010 Network Plan meets the minimum O₃ monitoring requirements specified by 40 CFR Part 58, Appendix D, Table D-2 in all areas.

Minimum PM₁₀ Monitoring Requirements
40 CFR Part 58, Appendix A 3.3.1
40 CFR Part 58, Appendix D, Table D-4

The State of North Carolina's current PM₁₀ primary monitoring network meets the minimum requirements for all areas. All PM₁₀ collocation requirements for manual methods found in 40 CFR Part 58, Appendix A, 3.3.1 are currently being met. Fifteen percent of each network of manual PM₁₀ methods (at least one site) must be collocated. Also, the sites with collocated monitors should be among those measuring annual mean concentrations in the highest 25 percent of the network. These collocation requirements are met in the Network Plan for manual PM₁₀ sampling.

Minimum PM_{2.5} Monitoring Requirements
40 CFR Part 58, Appendix A 3.2.5
40 CFR Part 58, Appendix D, Table D-5

The State of North Carolina's current PM_{2.5} monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-5 for all MSAs. Manual PM_{2.5} collocation requirements are found in 40 CFR Part 58, Appendix A, section 3.2.5. Fifteen percent of each network of manual PM_{2.5} methods (at least one site) must be collocated. The manual collocation requirement for PM_{2.5} is currently being met in the Network Plan. In addition, there is a requirement for 80% of these collocated monitors to be at sites that are $\pm 20\%$ of the NAAQS. Currently, only 20% of the collocated monitors are at sites $\pm 20\%$ of the NAAQS. EPA recommends that the collocated sites be moved to the appropriate sites to meet this requirement. The following monitoring sites currently have PM_{2.5} design values within $\pm 20\%$ percent of the NAAQS and are recommended for consideration as collocation monitors: Air Quality System (AQS) ID 37-035-004, AQS ID 37-057-0002, AQS ID 37-063-0001, AQS ID 37-071-0016, AQS ID 37-087-0010, AQS ID 37-119-0041, AQS ID 37-119-0042, AQS-ID 37-119-0043, AQS ID 37-135-0007, and AQS ID 37-159-0021.

PM_{2.5} Continuous Monitoring Requirements
40 CFR Part 58, Appendix D 4.7.2

Regulatory requirements for continuous PM_{2.5} monitoring require that "...State, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required [Federal Reference Method (FRM)/Federal Equivalent Method (FEM)/Approved Regional Method (ARM)] monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies." These

minimum continuous PM_{2.5} monitoring requirements are currently met in the all of the MSAs in the State. Also, the continuous PM_{2.5} collocation requirements are currently met in all MSAs. Therefore, the continuous PM_{2.5} monitoring network described in the 2010 Network Plan meets all of the design criteria of 40 CFR Part 58.

PM_{2.5} Background and Transport Sites
40 CFR Part 58, Appendix D 4.7.3

40 CFR Part 58, Appendix D, 4.7.3 requires that “each State shall install and operate at least one PM_{2.5} site to monitor for regional background and at least one PM_{2.5} site to monitor for regional transport.” The 2010 Network Plan identifies the PM_{2.5} sites at Mendenhall (AQS ID: 37-081-0013), Cherry Grove (AQS ID: 37-033-0001), and Jamesville (AQS ID: 37-117-0001) as background sites and the PM_{2.5} sites at Cherry Grove (AQS ID: 37-033-0001), Jamesville (AQS ID: 37-117-0001), and Bryson City (AQS ID: 37-173-0002) as regional transport sites. Therefore, NC-DAQ has satisfied the requirements of 40 CFR Part 58 for background and transport sites.

Lead (Pb) Monitoring Requirements
40 CFR Part 58, Appendix D 4.5

Ambient air monitoring network design criteria for Pb are found at section 4.5 of Appendix D to 40 CFR Part 58. This section requires that, at a minimum, there must be one source-oriented state and local air monitoring station (SLAMS) located to measure the maximum Pb concentration in ambient air resulting from each Pb source which emits 1.0 or more tons per year (t/yr).

NC-DAQ was not required to conduct ambient air monitoring at three sources (see list below) based upon submitted information in the 2009 and 2010 Network Plans indicating that the following sources will not contribute more than 1.0 t/yr. EPA concurs with this assessment and will not require ambient air monitoring at these sources in the 2010 Network Plan.

International Resistive Company (IRC)
736 Greenway Road
Boone, NC 28607

Nucor Steel
1505 River Road
Cofield, NC 27922

Carolina Power and Light Company (Progress Energy) Roxboro Steam Station
1700 Dunnaway Road
Semora, NC 27343

**Air Quality Index (AQI) Reporting
40 CFR §58.50**

AQI reporting is required in MSAs with populations over 350,000. There are 10 MSAs in the State of North Carolina required to report an AQI: Charlotte-Gasonia-Concord, Virginia Beach-Norfolk-Newport News, Raleigh-Cary, Greensboro-High Point, Durham-Chapel Hill, Winston-Salem, Asheville, Hickory-Lenoir-Morganton, Fayetteville, and Wilmington. NC-DAQ meets these AQI reporting requirements.

Monitoring Network Changes Proposed by NC-DAQ

NC-DAQ has proposed several monitoring network changes in the 2010 Network Plan. Any monitors listed in the Network Plan as possibly being relocated or discontinued are subject to a case-by-case evaluation by a letter request from NC-DAQ when NC-DAQ has a proposed shut-down date for that particular monitor or an approved regional method. Monitors proposed for discontinuation are summarized in Table 2.

Table 2: Monitors proposed for discontinuation/location change

AQS ID	Pollutant	Type	Comments
37-173-0002	SO ₂	SLAMS	Monitor was shut down after EPA approval dated June 24, 2010
37-081-0013	PM _{2.5}	QA Collocated	Collocated monitor shut down
37-087-0004	Ozone	SLAMS	Evicted from property, moving site across the road to Junaluska Elementary School, keep AQS ID the same for 250 meter location move
37-061-0002	PM ₁₀	PSD	PSD monitor shut down and convert to special purpose monitor operating every third year
37-107-0004	Ozone	SLAMS	Relocate monitor on property due to structure that obstructs air flow to monitor
37-069-0001	Ozone	SLAMS	Relocate monitor or shut down due to road construction

EPA has reviewed these requests for discontinuation or monitor relocation and determined that all of the requested monitors meet the requirements of 40 CFR §58.14(c)(6) for monitor relocation or are requests to shut down PSD or QA monitors, which are not subject to EPA Region 4 approval. EPA Region 4 encourages NC-DAQ to maintain the AQS ID 37-087-0004 instead of assigning a new AQS ID for this site because the site is only moved 250 meters. By maintaining the AQS ID, the NAAQS design values can be calculated continuously. The minimum monitoring requirements for PM₁₀, PM_{2.5}, and O₃ found in Appendix D to 40 CFR Part 58 will continue to be met for the respective MSAs after these monitors are discontinued or relocated.

NC-DAQ also requested to change the monitoring frequency at AQS ID 37-081-0013 (primary monitor) to 1-in-3 days. At this proposed frequency, the monitors will meet the PM_{2.5} operating schedule requirements under 40 CFR §58.12(d)(1)(i). Therefore, EPA approves the change to 1-in-3 day monitoring at these sites.

National Core (NCORE) Monitoring Network

NC-DAQ has designated two NCORE sites, AQS ID 37-183-0014 and AQS ID 37-119-0041, in the 2010 Network Plan. The first site (AQS ID 37-183-0014) is located at the East Millbrook Middle School site in Raleigh, NC. The second site (AQS ID 37-119-0041) is located at the Garinger site in Charlotte, NC and is operated by the Mecklenburg County Land Use and Environmental Services Agency. Official EPA approval was granted on October 30, 2009. All quality assurance procedures shall be implemented in accordance with 40 CFR Part 58, Appendix A.

Air Quality System (AQS)

Based on listings of monitor types in the Network Plan, NC-DAQ has several monitors that are listed as "other." EPA encourages the State to be more specific in their monitor types in AQS. Monitors that are listed as "other" will be treated as a SLAMS monitor for regulatory evaluations. Secondly, the State should verify that monitor types in AQS match those in the Network Plan. For example, the SO₂ monitor at AQS ID 37-051-1003 is listed as a special purpose monitor in the Network Plan, but as a SLAMS monitor in AQS. A similar case exists for PM₁₀ monitor AQS ID 37-081-0013, which is listed as "other" in the Network Plan, but as a SLAMS monitor in AQS. EPA uses the AQS designation for regulatory purposes and will consider both of these monitors SLAMS until approved otherwise. The State is responsible for maintaining current monitor type classifications in AQS.

Appendix E. 2011 Network Plan EPA Approval Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

OCT 20 2011

RECEIVED OCT 31 2011

Ms. Sheila C. Holman
Director
Division of Air Quality
North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Ms. Holman:

Thank you for submitting the State of North Carolina's 2011 annual ambient air monitoring network plan (Network Plan), dated July 1, 2011. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The Network Plan covers the ambient air monitoring network for the North Carolina Division of Air Quality and its local agencies.

The U. S. Environmental Protection Agency Region 4 understands that the NC-DAQ provided a 30-day public comment period and did not receive any public comments. According to 40 CFR §58.10(a)(2), since public inspection and comment have already been solicited, EPA Region 4 is not required to offer another comment period.

Based upon our review of the Network Plan, EPA Region 4 has determined that the plan satisfies the applicable requirements of 40 CFR part 58. Therefore the Network Plan is approved.

Thank you for working with us to monitor air pollution and promote healthy air quality in North Carolina and the nation. If you have any questions or concerns, please contact Doug Neeley at (404) 562-9097 or Katherine Snyder at (404) 562-9840.

Sincerely,

A handwritten signature in black ink, appearing to read "Gwendolyn Keyes Fleming".

Gwendolyn Keyes Fleming
Regional Administrator

Enclosures

cc: Mr. Donnie Redmond
Supervisor IV, North Carolina Dept. of Air Quality

Mr. Don R. Willard
Director, Mecklenburg County Land Use and Environmental Services Agency

Mr. William M. Barnette, Director
Director, Forsyth County Environmental Affairs Department

Mr. David Brigman
Director, Western North Carolina Regional Air Quality Agency

FY 2011 State of North Carolina Ambient Air Monitoring Network Plan
U.S. EPA Region 4 Comments and Recommendations

This document contains U.S. EPA Region 4 comments and recommendations on the State of North Carolina's 2011 ambient air monitoring network plan (Network Plan). Ambient air monitoring rules, which include regulatory requirements that address network plans, data certification, and minimum monitoring requirements, among other requirements, are found in 40 CFR Part 58. Minimum monitoring requirements for criteria pollutants are listed in 40 CFR Part 58, Appendix D. Minimum monitoring requirements do not exist for carbon monoxide (CO) unless required by the establishment of a National Core (NCore) multi-pollutant monitoring station, and/or a state implementation plan. However, new national ambient air quality standards (NAAQS) were promulgated in 2010 for nitrogen dioxide (NO₂) and sulfur dioxide (SO₂) with minimum monitoring requirements effective January 1, 2013. Minimum monitoring requirements for nitrogen dioxide (NO₂) will be addressed in the 2012 network plans. Minimum monitoring requirements are listed in this document for ozone (O₃), particulate matter less than 2.5 microns (PM_{2.5}), particulate matter less than 10 microns (PM₁₀), sulfur dioxide (SO₂), and lead (Pb).

The minimum monitoring requirements are based on metropolitan statistical area (MSA) boundaries as defined by the U.S. Office of Management and Budget (OMB), July 1, 2009, population estimates from the U.S. Census Bureau, and historical ambient air monitoring data. OMB currently defines 15 MSAs in the State of North Carolina. These MSAs and the respective July 1, 2009, population estimates from the U.S. Census Bureau are shown in Table 1.

Table 1: Metropolitan Statistical Areas and Populations

MSA Name	Population
Charlotte-Gastonia-Concord, NC-SC	1,745,524
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Asheville, NC	412,672
Hickory-Lenoir-Morganton, NC	365,364
Fayetteville, NC	360,355
Wilmington, NC	354,525
Greenville, NC	179,715
Jacksonville, NC	173,064
Burlington, NC	150,358
Rocky Mount, NC	146,536
Goldsboro, NC	113,811

**Minimum Ozone Monitoring Requirements
40 CFR Part 58, Appendix D, Table D-2**

The network described in the 2011 Network Plan meets the minimum O₃ monitoring requirements specified by 40 CFR Part 58, Appendix D, Table D-2 in all areas except for the Asheville and Hickory MSAs. The Asheville and Hickory MSAs each have the correct number of required ozone monitors

(two), but only one of those is designated as a State and Local Air Monitoring Station (SLAMS) and the second monitor is designated as “other.” For a monitor to contribute to the minimum monitoring requirement, it must be classified as a SLAMS monitor in EPA’s Air Quality System (AQS), thus the monitor classifications should be updated in AQS.

In addition, a supplemental request to the Network Plan was submitted via email on August 23, 2011 seeking to shutdown the Frying Pan monitor (AQS ID: 37-087-0035) 2-3 weeks prior to October 31. The Frying Pan monitor is operated year round by the National Park Service (NPS) in Great Smoky Mountains National Park. The NPS wants to shutdown the monitor because it needs to replace the monitor’s shelter. Replacing the shelter needs to be done before winter weather in the mountainous area makes the task too difficult. Getting this work done in October will help ensure that the monitor is operational by the beginning of the 2012 ozone monitoring season. EPA concurs that this is necessary and any impact to data completeness during this time frame will be noted appropriately by EPA.

Minimum PM₁₀ Monitoring Requirements

40 CFR Part 58, Appendix A, 3.3.1

40 CFR Part 58, Appendix D, Table D-4

The State of North Carolina’s current PM₁₀ primary monitoring network meets the minimum requirements for all areas. All PM₁₀ collocation requirements for manual methods found in 40 CFR Part 58, Appendix A, 3.3.1 are currently being met. These include the requirement that fifteen percent of each network of manual PM₁₀ methods (at least one site) must be collocated.

Minimum PM_{2.5} Monitoring Requirements

40 CFR Part 58, Appendix A, 3.2.5

40 CFR Part 58, Appendix D, Table D-5

The State of North Carolina’s current PM_{2.5} monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-5 for all MSAs. Manual PM_{2.5} collocation requirements are found in 40 CFR Part 58, Appendix A, 3.2.5. These include the requirement that fifteen percent of each network of manual PM_{2.5} methods (at least one site) must be collocated. The manual collocation requirements for PM_{2.5} are currently being met in the Network Plan.

PM_{2.5} Continuous Monitoring Requirements

40 CFR Part 58, Appendix D, 4.7.2

Regulatory requirements for continuous PM_{2.5} monitoring require that “...State, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D–5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM [Federal Reference Method/Federal Equivalent Method/Approved Regional Method] monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies.” These minimum continuous PM_{2.5} monitoring requirements are currently met in the all of the MSAs in the State. Also, the continuous PM_{2.5} collocation requirements are currently met in all MSAs. Therefore, the continuous PM_{2.5} monitoring network described in the 2011 Network Plan meets all of the design criteria of 40 CFR Part 58.

PM_{2.5} Background and Transport Sites
40 CFR Part 58, Appendix D, 4.7.3

40 CFR Part 58, Appendix D, 4.7.3 requires that “each State shall install and operate at least one PM_{2.5} site to monitor for regional background and at least one PM_{2.5} site to monitor for regional transport.” The 2011 Network Plan identifies seven PM_{2.5} sites as regional transport sites that include: Mendenhall (AQS ID: 37-081-0013), Cherry Grove (AQS ID: 37-033-0001), Springfield Road (AQS ID: 37-065-0004), Kenansville (AQS ID: 37-061-0002), Boone (AQS ID: 37-189-0003), Candor (AQS ID: 37-123-0001), and Jamesville (AQS ID: 37-117-0001). The Network Plan identifies three regional transport sites for PM_{2.5} identified as: Cherry Grove (AQS ID: 37-033-0001), Jamesville (AQS ID: 37-117-0001), and Bryson City (AQS ID: 37-173-0002). Therefore, NC-DAQ has satisfied the requirements of 40 CFR Part 58 for background and transport sites.

Lead Monitoring Requirements
40 CFR Part 58, Appendix D, 4.5

EPA recently revised the monitoring requirements for Pb found at 40 CFR Part 58, Appendix D, Section 4.5 (see 75 Federal Register 81126). These revisions reduced the emissions threshold for facilities near which source oriented Pb monitoring is required from 1.0 tons per year (tpy) to 0.5 tpy. The rule also removed population-based monitoring requirements for Pb and replaced them with a requirement to monitor for Pb at urban NCore sites.

40 CFR Part 58, Appendix D, 4.5 requires that “At a minimum, there must be one source-oriented SLAMS [state and local air monitoring station] site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year...”

In its network plan, North Carolina has requested that EPA grant a waiver of source-oriented Pb monitoring requirements for two sources. Section 4.5(a)(ii) of Appendix D to 40 CFR Part 58 provides the following provisions for a waiver of the Pb monitoring requirements:

“(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under 58.10(d).”

North Carolina has submitted air modeling indicating that the following sources will not contribute to a maximum Pb concentration in the ambient air in excess of 50% the NAAQS:

Blue Ridge Paper Products, Inc.
Canton, North Carolina

Saint Gobain Containers
Wilson, North Carolina

EPA has reviewed this information and concurs that the Pb emissions from each of these sources will not contribute to a maximum Pb concentration in the ambient air in excess of 50% of the NAAQS. Therefore, EPA is granting the waivers of the source-oriented ambient air monitoring requirements at these sources. The waivers must be renewed once every five years as part of the network assessment required under 40 CFR §58.10(d).

North Carolina has also requested that EPA consider revised emissions data related to source-oriented Pb monitoring requirements. North Carolina has submitted information indicating that the actual Pb emissions from the following sources are below 0.50 tpy:

Duke Energy Carolinas, LLC Belews Creek Steam Station Belews Creek, NC	Progress Energy Roxboro Plant Semora, NC
Duke Energy Carolinas, LLC Marshall Steam Station Terrell, NC	Royal Development Co High Point, NC
Duke Energy Carolinas, LLC Allen Steam Station Belmont, NC	U.S. Army Fort Bragg Cumberland County, NC
	U.S. Marine Corps Camp Lejeune Onslow County, NC

EPA has reviewed this information and concurs that the actual Pb emissions from these sources are below 0.50 tpy. Therefore, ambient air monitoring is not required at these sources. Population oriented monitoring is still required at urban NCore sites beginning on December 27, 2011. Based on the 2011 Network Plan, North Carolina will satisfy the minimum monitoring requirements for Pb.

Sulfur Dioxide Monitoring Requirements **40 CFR Part 58, Appendix D, 4.4**

Ambient air monitoring network design criteria for SO₂ are found in Section 4.4 of Appendix D to 40 CFR Part 58. This section requires that "The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA)." As a result, the SO₂ monitoring site(s) required in each CBSA will satisfy minimum monitoring requirements if the monitor(s) is sited within the boundaries of the parent CBSA and is one of the following site types: population exposure, maximum concentration, source-oriented, general background, or regional transport. An SO₂ monitor at a NCore station may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors consistent with Appendix D, 4.4.

The SO₂ network is to be operational beginning January 1, 2013. The Charlotte-Gastonia-Concord CBSA is required to have a total of two SO₂ monitors. Currently, there is only one operating SO₂ monitor in the CBSA, located at the Garinger site (AQS ID: 37-119-0041). In an e-mail dated September 20, 2011, South Carolina Department of Health and Environmental Control committed to establishing a SO₂ monitor at the York site (AQS ID: 45-091-0006) to assist in meeting the minimum monitoring requirements for this CBSA. Once the SO₂ monitor at the York monitoring site in South

Carolina becomes operational, the Charlotte-Gastonia-Concord CBSA will meet the minimum monitoring requirements under 40 CFR Part 58. Similarly, once the additional SO₂ monitor at Mendenhall (AQS ID: 37-081-0013) becomes operational, the Greensboro-High Point CBSA will meet the minimum monitoring requirements under 40 CFR Part 58. All the other CBSAs meet the minimum monitoring requirements based on the information provided in the 2011 Network Plan.

**Air Quality Index (AQI) Reporting
40 CFR §58.50**

AQI reporting is required in MSAs with populations over 350,000. There are 10 MSAs in the State of North Carolina required to report an AQI: Charlotte-Gastonia-Concord, Virginia Beach-Norfolk-Newport News, Raleigh-Cary, Greensboro-High Point, Durham-Chapel Hill, Winston-Salem, Asheville, Hickory-Lenoir-Morganton, Fayetteville, and Wilmington. NC-DAQ meets these AQI reporting requirements.

Monitoring Network Changes Proposed by NC-DAQ

NC-DAQ has proposed several monitoring network changes in its 2011 Network Plan. Monitors proposed for discontinuation are summarized in Table 2.

Table 2: Monitors proposed for discontinuation/location change

AQS ID	Pollutant	Type	Comments
37-183-0018	Carbon Monoxide	SLAMS	Will use the FRM CO monitor at the Millbrook site to fulfill the SIP requirements
37-173-0002	PM _{2.5}	SLAMS – Regional transport	Monitor will be shut down at completion of 20 month BAM study (5/2011)

EPA has reviewed these requests for discontinuation or monitor relocation and determined that all of the requested monitors, in Table 2, meet the requirements of 40 CFR §58.14(c)(6) for monitor discontinuation. The minimum monitoring requirements for PM_{2.5} and O₃ found in Appendix D to 40 CFR Part 58 will continue to be met for the respective MSAs after these monitors are discontinued.

NC-DAQ also requested to change the monitoring frequency at AQS IDs 37-081-0013, 37-071-0016, 37-051-0009, and 37-001-0001 to 1 in 6 day for PM_{2.5} sampling. At this proposed frequency, the monitors will meet the PM_{2.5} operating schedule requirements under 40 CFR §58.12(d)(1)(i). Therefore, EPA approves the change in monitoring frequency at these sites.

National Core (NCore) Monitoring Network

Ambient air monitoring network criteria for NCore sites are found in Section 3 of Appendix D to 40 CFR Part 58. NC-DAQ has designated two NCore sites in the 2011 Network Plan. The first site (AQS ID 37-183-0014) is located at the East Millbrook Middle School site in Raleigh, NC. The second site (AQS ID 37-119-0041) is located at the Garinger site in Charlotte, NC and is operated by the Mecklenburg County Land Use and Environmental Services Agency. Official EPA approval was granted for these sites on October 30, 2009. The 2011 Network Plan meets the minimum monitoring requirements for NCore sites.

Air Quality System (AQS)

During the review of the 2011 Network Plan, there were a few discrepancies identified between information in the Network Plan and in AQS. The State is responsible for updating monitor type classifications in AQS. Based on listings of monitor types in the Network Plan, NC-DAQ has several monitors that are listed as "other." EPA encourages the State to be more specific in their monitor types in AQS. Monitors that are listed as "other" will be treated as a SLAMS monitor for regulatory evaluations. For a monitor to count toward the minimum monitoring requirement (e.g. ozone requirements above), it must be classified as a SLAMS monitor in AQS, thus the monitor classifications should be updated in AQS (Waggin Trail AQS ID: 37-003-0004).

Also, the State should verify that monitor types in AQS match those in the Network Plan. For example, the ozone monitor at Waynesville (AQS ID 37-087-0004) is listed as a SLAMS monitor in the Network Plan, but as "other" in AQS. In addition, there are discrepancies in monitor type in AQS and the Network Plan for the following sites, AQS IDs: 31-159-0021-42101-1, 37-159-0021-44201-1, and 37-179-003-44201-1.

In addition, the State should verify the PM_{2.5} background monitor designations in AQS. There are two sites in AQS designated as PM_{2.5} background sites that are not designated in the network plan as background sites. These sites include: Pittsboro (AQS ID: 37-037-0004) and West Johnston (AQS ID: 37-101-0002).

Appendix F. 2012 Network Plan EPA Approval Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
SAM NUNN
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61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

Ms. Sheila C. Holman
Director
Division of Air Quality
North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

SEP 21 2012

Dear Ms. Holman:

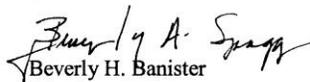
Thank you for submitting the state of North Carolina's 2012 annual ambient air monitoring network plan (Network Plan), dated July 2, 2012. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The Network Plan covers the ambient air monitoring network for the North Carolina Division of Air Quality and its local agencies.

The U.S. Environmental Protection Agency Region 4 understands that the NC-DAQ provided a 30-day public comment period and did not receive any public comments. According to 40 CFR §58.10(a)(2), since public inspection and comment have already been solicited, EPA Region 4 is not required to offer another comment period.

With this letter, EPA Region 4 is approving the North Carolina Network Plan with the exception of the NO₂ monitoring plans. The state will need to provide additional information on NO₂ monitoring as described in the enclosure. Once EPA Region 4 is in agreement with the additional information provided, the state will need to make the information available for public inspection. Upon completion of the public inspection process, EPA Region 4 will submit the NO₂ addendum to the Network Plan to the EPA Administrator for approval per 40 CFR 58.10(a)(5). We have enclosed comments on your network plan and will continue to work with your agency on the remaining portions of the plan that have not been approved with this letter.

Thank you for working with us to monitor air pollution and promote healthy air quality in North Carolina and the nation. If you have any questions or concerns, please contact Doug Neeley at (404) 562-9097 or Ryan Brown at (404) 562-9147.

Sincerely,


Beverly H. Banister
Director
Air, Pesticides and Toxics
Management Division

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Enclosure

cc: Mr. Donnie Redmond, Supervisor IV
North Carolina Department of Air Quality

Mr. Don R. Willard, Director
Mecklenburg County Land Use and Environmental Services Agency

Mr. William M. Barnette, Director
Forsyth County Environmental Affairs Department

Mr. David Brigman, Director
Western North Carolina Regional Air Quality Agency

Mr. Mike Peyton
Director, EPA Region 4 Science and Ecosystems Support Division

CY 2012 State of North Carolina Ambient Air Monitoring Network Plan
U.S. EPA Region 4 Comments and Recommendations

This document contains U.S. EPA Region 4 comments and recommendations on the state of North Carolina's 2012 ambient air monitoring network plan (Network Plan). Ambient air monitoring rules, which include regulatory requirements that address network plans, data certification, and minimum monitoring requirements, among other requirements, are found in 40 CFR Part 58. Minimum monitoring requirements for criteria pollutants are listed in 40 CFR Part 58, Appendix D. Minimum monitoring requirements are listed for ozone (O₃), particulate matter less than 2.5 microns (PM_{2.5}), particulate matter less than 10 microns (PM₁₀), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and lead (Pb).

The minimum monitoring requirements are based on core based statistical area (CBSA) boundaries, as defined by the U.S. Office of Management and Budget (OMB); July 1, 2011, population estimates from the U.S. Census Bureau; and historical ambient air monitoring data. Minimum monitoring requirements for O₃, PM_{2.5}, PM₁₀, only apply to metropolitan statistical areas (MSAs), which are a subset of CBSAs that contain an urban core of 50,000 or more population. OMB currently defines 15 MSAs in the state of North Carolina. These MSAs and the respective July 1, 2011, population estimates from the U.S. Census Bureau are shown in Table 1.

Table 1: Metropolitan Statistical Areas and Populations

MSA Name	Population
Charlotte-Gastonia-Rock Hill, NC-SC	1,795,472
Virginia Beach-Norfolk-Newport News, VA-NC	1,679,894
Raleigh-Cary, NC	1,163,515
Greensboro-High Point, NC	730,966
Durham-Chapel Hill, NC	512,979
Winston-Salem, NC	482,025
Asheville, NC	429,017
Fayetteville, NC	374,157
Wilmington, NC	369,685
Hickory-Lenoir-Morganton, NC	364,567
Greenville, NC	192,690
Jacksonville, NC	179,719
Burlington, NC	153,291
Rocky Mount, NC	152,157
Goldboro, NC	123,697

**Minimum O₃ Monitoring Requirements
40 CFR Part 58, Appendix D, Table D-2**

The state of North Carolina's proposed O₃ monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-2 for all MSAs. Additionally, the proposed O₃ monitoring network described in the Network Plan meets all of the design criteria of 40 CFR Part 58.

The Network Plan discusses that NC-DAQ may consider, depending on available resources, shutting down three O₃ monitors that are in excess of the required minimum monitoring. If NC-DAQ decides it would like to shutdown the monitors it will need to send a formal request to EPA.

Minimum PM₁₀ Monitoring Requirements

40 CFR Part 58, Appendix A, 3.3.1

40 CFR Part 58, Appendix D, Table D-4

The state of North Carolina's current PM₁₀ primary monitoring network meets the minimum requirements for all areas. All PM₁₀ collocation requirements for manual methods found in 40 CFR Part 58, Appendix A, 3.3.1 are currently being met. These include the requirement that fifteen percent of each network of manual PM₁₀ methods (at least one site) must be collocated.

Minimum PM_{2.5} Monitoring Requirements

40 CFR Part 58, Appendix A, 3.2.5

40 CFR Part 58, Appendix D, Table D-5

The state of North Carolina's current PM_{2.5} monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-5 for all MSAs. Manual PM_{2.5} collocation requirements are found in 40 CFR Part 58, Appendix A, 3.2.5. These include the requirement that fifteen percent of each network of manual PM_{2.5} methods (at least one site) must be collocated. The manual collocation requirements for PM_{2.5} are currently being met in the Network Plan.

The Network Plan discusses that NC-DAQ may consider, depending on available resources, shutting down two PM_{2.5} monitors. If NC-DAQ decides it would like to shutdown the monitors it will need to send a formal request to EPA.

PM_{2.5} Continuous Monitoring Requirements

40 CFR Part 58, Appendix D, 4.7.2

Regulatory requirements for continuous PM_{2.5} monitoring require that "...State, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM [federal reference method/federal equivalent method/approved regional method] monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies." These minimum continuous PM_{2.5} monitoring requirements are currently met in the all MSAs in the state. Also, the continuous PM_{2.5} collocation requirements are currently met in all MSAs. Therefore, the continuous PM_{2.5} monitoring network described in the 2012 Network Plan meets all of the design criteria of 40 CFR Part 58.

PM_{2.5} Background and Transport Sites

40 CFR Part 58, Appendix D, 4.7.3

Forty (40) CFR Part 58, Appendix D, 4.7.3 requires that "each state shall install and operate at least one PM_{2.5} site to monitor for regional background and at least one PM_{2.5} site to monitor for regional transport." The Network Plan identifies seven PM_{2.5} sites as general background sites that include: Mendenhall (AQS ID: 37-081-0013), Cherry Grove (AQS ID: 37-033-0001), Springfield Road (AQS ID: 37-065-0004), Kenansville (AQS ID: 37-061-0002), Boone (AQS ID: 37-189-0003), Candor (AQS

ID: 37-123-0001), and Jamesville (AQS ID: 37-117-0001). The Network Plan identifies three regional transport sites for PM_{2.5} identified as: Cherry Grove (AQS ID: 37-033-0001), Jamesville (AQS ID: 37-117-0001), and Bryson City (AQS ID: 37-173-0002). Therefore, NC-DAQ has satisfied the requirements of 40 CFR Part 58 for background and transport sites.

The Network Plan discusses that NC-DAQ may consider, depending on available resources, shutting down two regional transport/general background PM_{2.5} monitors and replacing them with BAMs. NC-DAQ will need to send a formal request to shut down these monitors to EPA, when it has finalized its decision. EPA will then consider the request.

**Lead Monitoring Requirements
40 CFR Part 58, Appendix D, 4.5**

Forty (40) CFR Part 58, Appendix D, 4.5 requires that “At a minimum, there must be one source-oriented SLAMS [state and local air monitoring station] site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year...”

Section 4.5(a)(ii) of Appendix D to 40 CFR Part 58 provides the following provisions for a waiver of the Pb monitoring requirements:

“(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the state or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under 58.10(d).”

In approving the state’s 2011 Network Plan, pursuant the provisions of the above section, EPA granted waivers of the source-oriented ambient air monitoring requirements at two sources: Blue Ridge Paper Products, Inc. in Canton, North Carolina and Saint Gobain Containers in Wilson, North Carolina. The waivers must be renewed every five years as part of the network assessment required under 40 CFR §58.10(d). There are no sources in North Carolina that are required to have source-oriented Pb monitoring at this time.

Forty (40) CFR Part 58, Appendix D, 3(b) requires that “NCore sites in CBSAs with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM₁₀.” This monitoring was required to begin December 27, 2011. The Network Plan indicates that Pb-PM₁₀ sampling is ongoing at the Charlotte NCore site (AQS ID: 37-119-0041) and the Raleigh NCore site (AQS ID: 37-183-0014). The Pb monitoring network described in the Network Plan meets all of the design criteria of 40 CFR Part 58.

**Sulfur Dioxide Monitoring Requirements
40 CFR Part 58, Appendix D, 4.4**

Ambient air monitoring network design criteria for SO₂ are found in Section 4.4 of Appendix D to 40 CFR Part 58. This section requires that “The population weighted emissions index (PWEI) shall be calculated by states for each core based statistical area (CBSA).” As a result, the SO₂ monitoring site(s) required in each CBSA will satisfy minimum monitoring requirements if the monitor(s) is sited within

the boundaries of the parent CBSA and is one of the following site types: population exposure, maximum concentration, source-oriented, general background, or regional transport. An SO₂ monitor at a NCore station may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors consistent with Appendix D, 4.4.

EPA's Office of Air Quality Planning and Standards (OAQPS) have updated the PWEI calculations using the latest available emissions inventory data and population estimates. Several areas in Region 4 have decreased monitoring requirements as a result of these new calculations, including four CBSAs in North Carolina. The Virginia Beach-Norfolk-Newport News and Charlotte-Gastonia-Concorde CBSAs will be required to operate one monitor instead of two. The Greensboro-High Point and Winston-Salem CBSAs will be required to operate minimally no monitors instead of one. The requirements did not change for the Durham or Wilmington CBSAs. The SO₂ requirements and discussed monitoring requirement changes are shown in Table 2 below.

Table 2: PWEI and SO₂ Required Monitors in North Carolina

CBSA Name	Sept 2011 PWEI Values	Sept 2011 PWEI Required Monitors	July 2012 PWEI Values	July 2012 PWEI Required Monitors	Change in Monitors Required
Virginia Beach-Norfolk-Newport News, VA-NC	100,711	2	78,540	1	-1
Charlotte-Gastonia-Concord, NC-SC	127,397	2	34,426	1	-1
Durham, NC	28,837	1	18,885	1	0
Wilmington, NC	12,246	1	10,045	1	0
Greensboro-High Point, NC	6,576	1	2,897	0	-1
Winston-Salem, NC	8,894	1	2,691	0	-1

The SO₂ network is to be operational beginning January 1, 2013. Existing SO₂ monitoring sites described in the Network Plan meet the minimum requirements of 40 CFR Part 58, in all areas except the Durham CBSA. North Carolina has proposed to install a new SO₂ monitor at the Durham Army site (AQS ID: 37-063-0015) to meet the PWEI requirement in this area. EPA approves this request.

**Nitrogen Dioxide (NO₂) Monitoring Requirements
40 CFR Part 58, Appendix D, 4.4**

Ambient air monitoring network design criteria for NO₂ are found in Section 4.3 of Appendix D to 40 CFR Part 58. There are three types of required NO₂ monitoring: near-road, area-wide, and Regional Administrator required. These types of NO₂ monitoring are described in sections 4.3.2, 4.3.3, and 4.3.4, respectively.

Any CBSA with a population of 500,000 or more persons is required to have a near-road NO₂ monitoring station that monitors expected maximum hourly concentrations near a major road. Any CBSA with a population of 2,500,000 or more persons or that has one or more roadway segments with a 250,000 or greater annual average daily traffic (AADT) count is required to have an additional near-road NO₂ monitoring station. The *Near-road NO₂ Monitoring Technical Assistance Document (TAD)* provides guidance to state and local agencies in selecting an appropriate near-road NO₂ monitoring location. This document can be found on the internet at <http://www.epa.gov/ttnamti1/files/nearroad/NearRoadTAD.pdf>.

Ambient air monitoring network design criteria for area-wide NO₂ sites are found in Section 4.3.3 of Appendix D to 40 CFR Part 58. Any CBSA with a population of 1,000,000 or more persons is required to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales.

Ambient air monitoring network design criteria for Regional Administrator required NO₂ monitoring, often referred to as RA-40 monitoring, are found in Section 4.3.4 of Appendix D to 40 CFR Part 58. This section states, “the Regional Administrators, in collaboration with states, must require a minimum of forty additional NO₂ monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Regional Administrators, working with states, may also consider additional factors ... to require monitors beyond the minimum network requirement.”

Pending action by the EPA Administrator, EPA Region 4 supports the selection of the Garinger (AQS ID: 37-119-0041) and Millbrook (AQS ID: 37-183-0014) sites in fulfillment of the area-wide NO₂ monitoring requirement for the Charlotte-Gastonia-Rock Hill and Raleigh-Cary CBSAs. We note your acknowledgement that the Hattie Avenue site (AQS ID: 37-067-0022) should be considered among the NO₂ monitors intended to help protect susceptible and vulnerable populations. EPA Region 4 also supports the proposed near-road NO₂ site located at Triple Oak Road in the Raleigh-Cary CBSA and required by 40 CFR 58, Appendix D, 4.3.2.

The state will need to provide EPA with an addendum to its Network Plan containing additional information on its near-road NO₂ monitoring plans in the Charlotte-Gastonia-Rock Hill CBSA.

The addendum should also include additional information about the proposed near-road monitoring site. Section 13.5 of the near-road NO₂ TAD and Table 13.1 of the TAD discuss important site and road parameters when evaluating a near-road site. Using the TAD as a reference, additional information provided on near-road NO₂ monitoring should include; at minimum, the following information for each site:

- Proposed AQS ID
- Street address and site geographical coordinates (longitude and latitude)
- Target road segment description including type of road
- Site pictures facing 4-8 directions – N, S, E, W, NE, NW, SE, SW
- Probable distance between the inlet probe and the outside nearest edge of the target road
- Site property description including property owner and feasibility of site access
- Roadway design and configuration
- Presence of any roadside structures
- Nearest windrose representative of the site and orientation of the site with respect to the predominate wind direction
- Traffic data and ranking information (see Table 6-3 of the Technical Assistance Document), as well as the source and vintage of the data
- Sampling and analysis method(s) for each measured parameter
- Operating schedules for each monitor at the site.

- Monitoring objective and spatial scale of representativeness for each monitor at the site.
- MSA, CBSA, CSA or other area represented by the monitor
- Discussion of other siting criteria

Once EPA Region 4 is in agreement with the proposed near-road site, the state will need to make the information available for public inspection. Upon completion of the public inspection process, EPA Region 4 will submit the NO₂ addendum to the Network Plan to the EPA Administrator for approval per 40 CFR 58.10(a)(5). We will continue to work with your agency as needed to get the near-road NO₂ site operational as expeditiously as possible.

Air Quality Index (AQI) Reporting
40 CFR §58.50

AQI reporting is required in MSAs with populations over 350,000. There are 10 MSAs in the state of North Carolina required to report an AQI: Charlotte-Gastonia-Concord, Virginia Beach-Norfolk-Newport News, Raleigh-Cary, Greensboro-High Point, Durham-Chapel Hill, Winston-Salem, Asheville, Hickory-Lenoir-Morganton, Fayetteville, and Wilmington. NC-DAQ meets these AQI reporting requirements.

Monitoring Network Changes Proposed by NC-DAQ

In the Network Plan, NC-DAQ has proposed to discontinue monitoring for CO at the Rockwell site (AQS ID: 37-159-0021). EPA has reviewed this request for discontinuation and determined that it meets the requirements of 40 CFR §58.14(c)(6) for monitor discontinuation.

National Core (NCore) Monitoring Network

Ambient air monitoring network criteria for NCore sites are found in Section 3 of Appendix D to 40 CFR Part 58. NC-DAQ designated two NCore sites in the Network Plan. The first site (AQS ID 37-183-0014) is located at the East Millbrook Middle School site in Raleigh, NC. The second site (AQS ID 37-119-0041) is located at the Garinger site in Charlotte, NC and is operated by the Mecklenburg County Land Use and Environmental Services Agency. Official EPA approval was granted for these sites on October 30, 2009. The 2012 Network Plan meets the minimum monitoring requirements for NCore sites.

Appendix G. 2013 Network Plan EPA Approval Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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NOV 25 2013

Ms. Sheila C. Holman
Director
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North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Ms. Holman:

Thank you for submitting the state of North Carolina's 2013 annual ambient air monitoring network plan (Network Plan), dated July 2, 2013. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The Network Plan covers the ambient air monitoring network for the North Carolina Division of Air Quality (NC-DAQ) and the local air quality agencies in North Carolina.

The U.S. Environmental Protection Agency understands that the NC-DAQ provided a 30-day public comment period and did not receive any public comments. According to 40 CFR §58.10(a)(2), since public inspection and comment have already been solicited, the EPA is not required to offer another comment period. The EPA approves North Carolina's 2013 Network Plan.

Thank you for working with us to monitor air pollution and promote healthy air quality in North Carolina and the nation. If you have any questions or concerns, please contact Gregg Worley at (404) 562-9141 or Ryan Brown at (404) 562-9147.

Sincerely,

A handwritten signature in black ink that reads "Jeaneanne M. Gettle".

Jeaneanne M. Gettle,
Acting Director
Air, Pesticides and Toxics
Management Division

Enclosure

cc: Mr. Donnie Redmond
Ambient Monitoring Section Chief, NC-DAQ

Mr. Leslie Rhodes
Director, Mecklenburg County Land Use and
Environmental Services Agency

Mr. William M. Barnette, Director
Forsyth County Environmental Affairs Department

Mr. David Brigman, Director
Western North Carolina Regional Air Quality Agency

FY 2013 State of North Carolina Ambient Air Monitoring Network Plan
U.S. EPA Region 4 Comments and Recommendations

This document contains the U.S. EPA comments and recommendations on the state of North Carolina's 2013 ambient air monitoring network plan (Network Plan). Ambient air monitoring rules, which include regulatory requirements that address network plans, data certification, and minimum monitoring requirements, among other requirements, are found in 40 CFR Part 58. Minimum monitoring requirements for criteria pollutants are listed in 40 CFR Part 58, Appendix D. Minimum monitoring requirements are listed for ozone (O₃), particulate matter less than 2.5 microns (PM_{2.5}), particulate matter less than 10 microns (PM₁₀), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and lead (Pb).

The minimum monitoring requirements are based on core based statistical area (CBSA) boundaries as defined by the U.S. Office of Management and Budget, July 1, 2011, population estimates from the U.S. Census Bureau, and historical ambient air monitoring data. Minimum monitoring requirements for O₃, PM_{2.5}, PM₁₀, only apply to metropolitan statistical areas (MSAs), which are a subset of CBSAs. OMB currently defines 17 MSAs in the state of North Carolina. On February 1, 2013, OMB redefined the CBSA boundaries based on 2010 census data. In North Carolina, there are two newly defined MSA's: Myrtle Beach-Conway-North Myrtle Beach, SC-NC and New Bern, NC that were previously defined as micropolitan CBSAs. Additionally, some MSA populations changed due to the inclusion and/or exclusion of counties from OMB's February 2013 MSA delineations. The 2009 and 2013 defined MSAs and the respective July 1, 2011, and 2012 population estimates from the U.S. Census Bureau are shown in Table 1.

Table 1: Metropolitan Statistical Areas and Populations

MSA Name	2011 Population	2012 Population
	2009 MSA definition	2013 MSA definition
Charlotte-Concord-Gastonia, NC-SC	1,795,472	2,296,569
Virginia Beach-Norfolk-Newport News, VA-NC	1,679,894	1,699,925
Raleigh, NC	1,163,515	1,188,564
Greensboro-High Point, NC	730,966	736,065
Winston-Salem, NC	482,025	647,697
Durham-Chapel Hill, NC	512,979	522,826
Asheville, NC	429,017	432,406
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	NA*	394,542
Fayetteville, NC	374,157	374,585
Hickory-Lenoir-Morganton, NC	369,685	363,627
Wilmington, NC	364,567	263,429
Jacksonville, NC	192,690	183,263
Greenville, NC	179,719	172,554
Burlington, NC	153,291	153,920
Rocky Mount, NC	152,157	151,662
New Bern, NC	NA*	128,119
Goldsboro, NC	123,697	124,246

*previously micropolitan CBSA

Minimum O₃ Monitoring Requirements
40 CFR Part 58, Appendix D, Table D-2

The state of North Carolina's proposed O₃ monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-2 for all MSAs, except the Myrtle Beach-Conway-North Myrtle Beach MSA.

Due to changes that OMB made to MSA boundaries in February of 2013, Brunswick County, North Carolina has been added to the Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA. This change has triggered the requirement for an O₃ monitor in this MSA. The 2013 Network Plan indicates that NC-DAQ has entered into discussions with the SC Department of Health and Environmental Control (SC DHEC) and other stakeholders to identify an appropriate location for a new monitoring site. Once a suitable monitoring location is identified, information regarding the site can be provided either as an amendment to the current Network Plan or in next year's Network Plan.

The Network Plan also proposes to shutdown the O₃ monitor at the Enochville site (AQS ID 37-159-0022). EPA approves the shutdown of this monitor. The EPA reviewed historical data and other information to make this determination. The O₃ monitor at the Rockwell site (AQS ID 37-159-0021) is in the same county and has recorded similar values compared to the Enochville monitor over the last five years. After the Enochville monitor is shutdown, the Charlotte-Concord-Gastonia, NC-SC MSA would still meet the minimum monitoring requirements found in 40 CFR Part 58, Appendix D.

Additionally, the Network Plan proposes to relocate two O₃ monitoring sites: Waggin Trail (AQS ID 37-003-0004) and Bent Creek (AQS ID 37-021-0030). The EPA approved the relocation of the Bent Creek ozone site in a letter to the Western North Carolina Regional Air Quality Agency dated April 29, 2013. The new Bent Creek location is less than a mile from the previous site and has the same AQS ID.

The EPA also approves the relocation of the Waggin Trail site to a new location that will be named Taylorsville 2013 with an AQS ID of 37-003-0005. The EPA has reviewed the North Carolina Division of Air Quality's (NC-DAQ) request to relocate the Waggin Trail O₃ site and determined that this monitor meets the relocation requirements of 40 CFR § 58.14(c)(6). The Taylorsville 2013 site is nearby the Waggin Trail site and should be representative of the same spatial scale as the Waggin Trail site.

Minimum PM₁₀ Monitoring Requirements
40 CFR Part 58, Appendix A, 3.3.1
40 CFR Part 58, Appendix D, Table D-4

The state of North Carolina's current PM₁₀ primary monitoring network meets the minimum requirements for all areas. All PM₁₀ collocation requirements for manual methods found in 40 CFR Part 58, Appendix A, 3.3.1 are currently being met. These include the requirement that fifteen percent of each network of manual PM₁₀ methods (at least one site) must be collocated.

Minimum PM_{2.5} Monitoring Requirements
40 CFR Part 58, Appendix A, 3.2.5
40 CFR Part 58, Appendix D, Table D-5

The state of North Carolina's current PM_{2.5} monitoring network meets the minimum requirements found in 40 CFR Part 58, Appendix D, Table D-5 for all MSAs. Manual PM_{2.5} collocation requirements are

found in 40 CFR Part 58, Appendix A, 3.2.5. These include the requirement that fifteen percent of each network of manual PM_{2.5} methods (at least one site) must be collocated. The manual collocation requirements for PM_{2.5} are currently being met in the Network Plan.

The Network Plan proposes to shut down three PM_{2.5} monitors at the end of 2013: Finley Farm (AQS ID 37-183-0020), Springfield Rd (AQS ID 37-065-0004), and Lenoir Community College (AQS ID 37-107-0004). The design values for all three PM_{2.5} monitors have been trending down in recent years and are all well below the NAAQS. The most recent design values (2009-2012) for these monitors are 9.3, 8.9, and 9.0 micrograms per cubic meter, respectively. After the shutdown of these PM_{2.5} monitors, the state's network would still meet the minimum monitoring requirements found in 40 CFR Part 58, Appendix D. Therefore, the EPA approves the shutdown of the Finley Farm, Springfield Rd, and Lenoir Community College PM_{2.5} monitors.

After submission of the Network Plan, NC-DAQ sent a formal request, dated October 1, 2013 to relocate the Spruce Pine (AQS ID 37-121-0001) PM_{2.5} monitor. The EPA has reviewed ND-DAQ's request to relocate the Spruce Pine PM_{2.5} monitor and determined that this monitor meets the relocation requirements of 40 CFR § 58.14(c)(6). The proposed BRR Hospital site is nearby the existing Spruce Pine site and should be representative of the same spatial scale as the Spruce Pine site. The EPA approves the relocation of the Spruce Pine PM_{2.5} monitor to the proposed BRR Hospital site, which will have the AQS ID of 37-121-0004.

PM_{2.5} Continuous Monitoring Requirements 40 CFR Part 58, Appendix D, 4.7.2

Regulatory requirements for continuous PM_{2.5} monitoring require that "...State, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM [federal reference method/federal equivalent method/approved regional method] monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies." These minimum continuous PM_{2.5} monitoring requirements are currently met in the all MSAs in the state. Also, the continuous PM_{2.5} collocation requirements are currently met in all MSAs. Therefore, the continuous PM_{2.5} monitoring network described in the 2013 Network Plan meets all of the design criteria of 40 CFR Part 58.

PM_{2.5} Background and Transport Sites 40 CFR Part 58, Appendix D, 4.7.3

40 CFR Part 58, Appendix D, 4.7.3 requires that "each State shall install and operate at least one PM_{2.5} site to monitor for regional background and at least one PM_{2.5} site to monitor for regional transport." The Network Plan identifies six PM_{2.5} sites as general background sites that include: Mendenhall (AQS ID: 37-081-0013), Cherry Grove (AQS ID: 37-033-0001), Kenansville (AQS ID: 37-061-0002), Boone (AQS ID: 37-189-0003), Candor (AQS ID: 37-123-0001), and Jamesville (AQS ID: 37-117-0001). The Network Plan identifies three regional transport sites for PM_{2.5} identified as: Cherry Grove (AQS ID: 37-033-0001), Jamesville (AQS ID: 37-117-0001), and Bryson City (AQS ID: 37-173-0002). Therefore, NC-DAQ has satisfied the requirements of 40 CFR Part 58 for background and transport sites.

Pb Monitoring Requirements
40 CFR Part 58, Appendix D, 4.5

40 CFR Part 58, Appendix D, 4.5 requires that “At a minimum, there must be one source-oriented SLAMS [state and local air monitoring station] site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year...”

Section 4.5(a)(ii) of Appendix D to 40 CFR Part 58 provides the following provisions for a waiver of the Pb monitoring requirements:

“(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under 58.10(d).”

In its approval of the state’s 2011 Network Plan, pursuant the provisions of the above section, The EPA granted the waivers of the source-oriented ambient air monitoring requirements at two sources: Blue Ridge Paper Products, Inc. in Canton, North Carolina and Saint Gobain Containers in Wilson, North Carolina. The waivers must be renewed every five years as part of the network assessment required under 40 CFR §58.10(d).

40 CFR Part 58, Appendix D, 3(b) requires that “NCore sites in CBSA with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM₁₀.” This monitoring was required to begin December 27, 2011. The Network Plan indicates that Pb-PM₁₀ sampling is ongoing at the Charlotte NCore site (AQS ID: 37-119-0041) and the Raleigh NCore site (AQS ID: 37-183-0014). As a result, the Pb monitoring network described in the Network Plan meets all of the design criteria of 40 CFR Part 58.

SO₂ Monitoring Requirements
40 CFR Part 58, Appendix D, 4.4

Ambient air monitoring network design criteria for SO₂ are found in Section 4.4 of Appendix D to 40 CFR Part 58. This section requires that “The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA).” As a result, the SO₂ monitoring site(s) required in each CBSA will satisfy minimum monitoring requirements if the monitor(s) is sited within the boundaries of the parent CBSA and is one of the following site types: population exposure, maximum concentration, source-oriented, general background, or regional transport. An SO₂ monitor at a NCore station may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors consistent with Appendix D, 4.4.

Table 2 shows the required SO₂ monitors based on the 2012 PWEI. Existing SO₂ monitoring sites described in the Network Plan meet the minimum requirements of 40 CFR Part 58.

Table 2: PWEI and SO₂ Required Monitors in North Carolina

CBSA Name	July 2012 PWEI Values	July 2012 PWEI Required Monitors
Virginia Beach-Norfolk-Newport News, VA-NC	78,540	1
Charlotte-Gastonia-Concord, NC-SC	34,426	1
Durham, NC	16,885	1
Wilmington, NC	10,045	1

**NO₂ Monitoring Requirements
40 CFR Part 58, Appendix D, 4.4**

Ambient air monitoring network design criteria for NO₂ are found in Section 4.3 of Appendix D to 40 CFR Part 58. There are three types of required NO₂ monitoring: near-road, area-wide, and Regional Administrator required. These types of NO₂ monitoring are described in sections 4.3.2, 4.3.3, and 4.3.4 respectively.

Any CBSA with a population of 500,000 or more persons is required to have a near-road NO₂ monitoring station that monitors expected maximum hourly concentrations near a major road. Any CBSA with a population of 2,500,000 or more persons or that has one or more roadway segments with a 250,000 or greater annual average daily traffic (AADT) count is required to have an additional near-road NO₂ monitoring station. The *Near-road NO₂ Monitoring Technical Assistance Document (TAD)* provides guidance to state and local agencies in selecting an appropriate near-road NO₂ monitoring location. This document can be found on the internet at <http://www.epa.gov/ttnamti1/files/nearroad/NearRoadTAD.pdf>.

Ambient air monitoring network design criteria for area-wide NO₂ sites are found in Section 4.3.3 of Appendix D to 40 CFR Part 58. Any CBSA with a population of 1,000,000 or more persons is required to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales.

Ambient air monitoring network design criteria for Regional Administrator required NO₂ monitoring, often referred to as RA-40 monitoring, are found in Section 4.3.4 of Appendix D to 40 CFR Part 58. This section states that “the Regional Administrators, in collaboration with States, must require a minimum of forty additional NO₂ monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Regional Administrators, working with States, may also consider additional factors ... to require monitors beyond the minimum network requirement.”

The EPA Region 4 approves the selection of the Triple Oak (AQS ID 37-183-0021) site in fulfillment of the near-road NO₂ requirement for the Raleigh, NC CBSA. In the Network Plan, Mecklenburg County Air Quality (MCAQ) proposed two potential sites to meet the requirement for the near-road NO₂ requirement in the Charlotte-Concord-Gastonia, NC-SC. In July of 2013, the EPA Region 4 staff visited MCAQ’s proposed location on Remount Road. MCAQ communicated that due to site access and siting issues the proposed site near Remount Road would be preferable to the proposed site located on Toomey

Avenue. The EPA approves the selection of the near-road site on Remount Road (AQS ID 37-119-0045) in fulfillment of the near-road NO₂ requirement. As discussed in the Network Plan, the Greensboro-High Point, NC; Winston-Salem, NC; and Durham-Chapel Hill, NC CBSAs will be required to have near-road NO₂ monitoring by January 1, 2017.

The EPA approves the selection of the Garinger (AQS ID: 37-119-0041) and Millbrook (AQS ID: 37-183-0014) sites in fulfillment of the area-wide NO₂ monitoring requirement for the Charlotte-Gastonia-Rock Hill and Raleigh-Cary CBSAs.

The EPA selects the Hattie Avenue site (AQS ID 450-045-0015) operated by Forsyth County Office of Environmental Assistance and Protection as a location for a Regional Administrator required NO₂ monitor to help protect susceptible and vulnerable populations. The full list of NO₂ monitors identified by the EPA's Regional Administrators can be found on the EPA's website at <http://www.epa.gov/ttnamti1/svpop.html>.

**Air Quality Index (AQI) Reporting
40 CFR §58.50**

AQI reporting is required in MSAs with populations over 350,000. There are 10 MSAs in the state of North Carolina required to report an AQI: Charlotte-Gastonia-Concord, Virginia Beach-Norfolk-Newport News, Raleigh-Cary, Greensboro-High Point, Durham-Chapel Hill, Winston-Salem, Asheville, Hickory-Lenoir-Morganton, Fayetteville, and Wilmington. NC-DAQ meets these AQI reporting requirements.

Monitoring Network Changes Proposed by NC-DAQ

NC-DAQ has proposed several monitoring network changes in its 2013 Network Plan. Monitors proposed for discontinuation or relocation are summarized in Table 3.

Table 3: Monitors Proposed for Discontinuation/Relocation

AQS ID	Site Name	Pollutant	Type	Comments
37-159-0022	Enochville	O ₃	SLAMS	Approved: Monitor will be shutdown at the end of the 2013 O ₃ season
37-003-0004	Waggin Trail	O ₃	SLAMS	Approved: Monitor will shutdown at the end of the 2013 O ₃ season and will be replaced with a nearby O ₃ monitor – Taylorsville 2013 (AQS ID 37-003-0005)
37-183-0020	Finley Farm	PM _{2.5}	SLAMS	Approved: Monitor will shut down 12/31/2013
37-065-0004	Springfield Rd	PM _{2.5}	SLAMS	Approved: Monitor will shut down 12/31/2013
37-107-0004	Lenoir Community College	PM _{2.5}	SLAMS	Approved: Monitor will shut down 12/31/2013
37-121-0001	Spruce Pine	PM _{2.5}	SLAMS	Approved: Monitor will be relocated less than a mile from the existing site and will have a new AQS ID 37-121-0004

The EPA reviewed these requests for monitor discontinuation or relocation and determined that they all meet the requirements of 40 CFR §58.14(c) for monitor discontinuation and relocation. The minimum monitoring requirements for PM_{2.5} and O₃ found in Appendix D to 40 CFR Part 58 will continue to be met for the respective MSAs after these monitors are discontinued or relocated.

The EPA also has reviewed and approves the location for the startup of the all monitors listed in Table 4.

Table 4: Monitors Proposed for Startup

AQS ID	Site Name	Pollutant	Type	Comments
37-183-0021	Triple Oak	NO ₂	SLAMS – near-road	Approved: site establishment for near-road NO ₂ monitoring
37-119-0045	Remount Road	NO ₂	SLAMS – near-road	Approved: site establishment for near-road NO ₂ monitoring
37-003-0005	Taylorsville 2013	Ozone	SLAMS	Approved: will replace Waggin Trail site
37-121-0004	BRR Hospital	PM _{2.5}	SLAMS	Approved: will replace the Spruce Pine site

National Core (NCore) Monitoring Network

Ambient air monitoring network criteria for NCore sites are found in Section 3 of Appendix D to 40 CFR Part 58. NC-DAQ designated two NCore sites in the 2013 Network Plan. The first site (AQS ID 37-183-0014) is located at the East Millbrook Middle School site in Raleigh, NC. The second site (AQS ID 37-119-0041) is located at the Garinger site in Charlotte, NC and is operated by MCAQ. Official The EPA approval was granted for these sites on October 30, 2009. The 2013 Network Plan meets the minimum monitoring requirements for NCore sites.

Appendix H. Monitoring Agreement Between Virginia and North Carolina for the Virginia Beach-Norfolk-New Port News Metropolitan Statistical Area



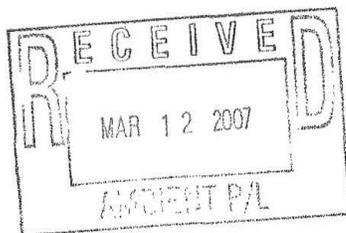
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MAR 06 2007

4APT-ATMB

Keith Overcash, Director
Division of Air Quality
NC Department of Environment &
Natural Resources
641 Mail Service Center
Raleigh, NC 27699-1641



Dear Mr. Overcash:

This correspondence is in response to two letters from the North Carolina Department of Environment and Natural Resources, Division of Air Quality (NCDAQ). The first letter dated January 4, 2007; "40 CFR Part 58.12(d)(1) Daily PM_{2.5} Sampling - Catawba County", and the second letter dated January 11, 2007; "Virginia/North Carolina MSA Agreement" are discussed in this letter.

40 CFR Part 58.12(d)(1) Daily PM_{2.5} Sampling - Catawba County

Your letter stated that the Catawba site Air Quality System (AQS) site, 37-035-0004, met the operational requirement for everyday sampling frequency effective January 1, 2007. Region 4 acknowledges your concerns regarding the increase of the 103 Grant Operations and Maintenance funding that will be the result of the increased PM_{2.5} sampling frequency. Funds will be allocated for new monitoring requirements mandated in the revisions to the ambient air monitoring regulations in the FY07 103 Grant. These funds will be distributed to the State and Local Agencies as expeditiously as possible. However, a definitive date cannot be given at this time.

Virginia/North Carolina MSA Agreement

Region 4 approves the agreement between the Commonwealth of Virginia Department of Environmental Quality (VADEQ) and NCDAQ in respect to North Carolina's and Virginia's ambient air monitor network design for the Norfolk-Virginia Beach-Newport News, VA-NC Metropolitan Statistical Area (MSA) in accordance with 40 CFR Part 58 Appendix D Section 2 (e). Region 4 concurs with VADEQ's assessment that their PM_{2.5} and ozone monitoring network meet the minimum requirement for this MSA. Region 4 also concurs that the addition of a PM₁₀ monitor at the proposed Hampton, Virginia site will be sufficient to meet applicable PM₁₀ network design criteria for this area.

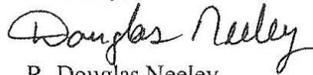


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If you have further questions, please contact Artra B. Cooper of EPA Region 4 at (404) 562-9047.

Sincerely,



R. Douglas Neeley

Chief

Air Toxics and Monitoring Branch

Air Pesticides & Toxics Management Division

cc: Hoke Kimball, NCDAQ
Charles Valerie, NCDAQ
James E. Sydnor, Director. VADEQ
Walter Wilkie, US EPA Region III Air Division



Handwritten initials/signature

North Carolina Department of Environment and Natural Resources
Division of Air Quality

Michael F. Easley, Governor

William G. Ross, Jr., Secretary
B. Keith Overcash, P.E., Director

January 11, 2007

Mr. R. Douglas Neeley, Chief
Air Toxics and Monitoring Branch
US EPA Region IV
Atlanta Federal Center
61 Forsyth Street
Atlanta, GA 30303-8960

Subject: Norfolk-Virginia Beach-Newport News, Virginia/North Carolina MSA agreement

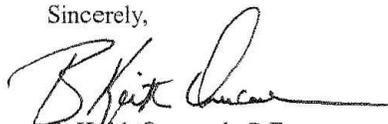
Dear Mr. Neeley:

Attached you will find a copy of the December 21, 2006 agreement between Virginia and North Carolina addressing the September 2006 revisions to the Ambient Air Monitoring Regulations from 40 CFR Part 58 Appendix D listed under EPA-HQ-OAR-2004-0018; FRL-RIN 2060-AJ25. The Norfolk-Virginia Beach- Newport News, Virginia/NC MSA includes Currituck County, North Carolina as part of this MSA.

This letter requests your approval of the attached agreement letter between Virginia and North Carolina with respect to the following passage under Network Design Criteria page 451 2 (e):

"The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or Local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator."

Sincerely,



B. Keith Overcash, P.E.

Attachments

CC: James E. Sydnor, Dir. Virginia DEQ Air Quality, PO Box 1105, Richmond VA 32318
Hoke Kimball, NC DAQ
Charles Valrie, NC DAQ
Norfolk_Va Beach-Newport New, VFA-NC MSA agreement

Ambient Monitoring Section
1641 Mail Service Center, Raleigh, North Carolina 27699-1641
2728 Capital Blvd., Raleigh, North Carolina 27604
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North Carolina Department of Environment and Natural Resources
Division of Air Quality

Michael F. Easley, Governor

William G. Ross, Jr., Secretary
B. Keith Overcash, P.E., Director

Mailed Jan. 11

January 11, 2007

Mr. James E. Sydnor, Director
Air Quality Division
Virginia Department of Environmental Quality
Richmond, Virginia 23218

Subject: Norfolk-Virginia Beach-Newport News, Virginia/North Carolina MSA agreement

Dear Jim:

We are in receipt of your letter of December 21, 2006 which addresses the September 2006 revisions to the Ambient Air Monitoring Regulations from 40 CFR Part 58 Appendix D listed under EPA-HQ-OAR-2004-0018; FRL-RIN 2060-AJ25 on the following topic:

"The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or Local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator."

Thank you for the invitation to participate in Virginia's annual ambient air monitoring network review. Please know that the North Carolina annual monitoring network review is available for your staff to use at any time also. We are in agreement with your letter and will have a copy sent to our EPA representative in Region IV to represent the fulfillment of the above requirement and also for their approval.

Please let us know if you have any questions regarding our monitoring as part of the Norfolk-Virginia Beach-Newport News MSA.

Sincerely,

B. Keith Overcash, P.E.

CC: Hoke Kimball, NC DAQ
Charles Valrie, NC DAQ
Joette Steger, NC DAQ

Norfolk_Va Beach-Newport New, VEA-NC MSA agreement2

Ambient Monitoring Section
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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

December 21, 2006

Mr. B. Keith Overcash
Division of Air Quality
North Carolina Department of Environment and Natural Resources
2728 Capital Boulevard (1641 MSC)
Raleigh, North Carolina 27699

Mr. Overcash: *Keith*

The September 2006 Revisions to the NAAQS for Particulate Matter ((FLR-RIN 2060-AJ25, page 451), states that "The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or Local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator." The document also gives minimum requirements for monitoring ozone, PM2.5 and PM10 with regard to MSA population (tables attached). Virginia and North Carolina share the Norfolk-VA Beach-Newport News, VA-NC MSA, which is comprised of the following areas:

Counties

- Currituck County, NC
- Gloucester County, VA
- Isle of Wight County, VA
- James City County, VA
- Mathews County, VA
- Surry County, VA
- York County, VA

Cities

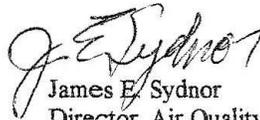
- Chesapeake, VA
- Hampton, VA
- Newport News, VA
- Norfolk, VA
- Poquoson, VA
- Portsmouth, VA
- Suffolk, VA
- VA Beach, VA
- Williamsburg, VA

The US Census Bureau does not include Surry County, VA in the Norfolk-VA Beach-Newport News, VA-NC MSA. Other listings include Surry County and Southampton County. The most prevalent listing (as shown) is from the US Office of Management and Budget.

The Norfolk-VA Beach-Newport News, VA-NC MSA 2000 population as given by the Brookings Institute is 1.6 million. The Virginia air monitoring network meets the minimum number of monitors in this MSA for ozone and PM2.5. However, where the table calls for two PM10 monitors, there is only one PM10 monitoring site in the MSA. A second PM10 is scheduled to be installed in the Hampton, VA area this month.

The VA DEQ suggests that the ambient air monitoring network (Hampton PM10 included) is sufficient to reflect proper characterization air pollution in the Norfolk-Virginia Beach-Newport News, VA-NC MSA. However it is also the intent of this letter to assure North Carolina that the VA DEQ will share any and all quality assured ambient air data collected in the Virginia portion of this MSA. It is also the intent of the VA DEQ that the North Carolina Department of Environment is notified and invited to participate in Virginia's annual ambient air monitoring network review.

Sincerely,



James E. Sydnor
Director, Air Quality Division
Virginia Department of Environmental Quality

JES/tj

Attachments

cc: Walter Wilkie, US EPA III
Hoke Kimball, Ambient Monitoring Section, NC DENR
Thomas Jennings, Air Quality Monitoring, VA DEQ

Table D-2 of Appendix D to Part 58. SLAMS Minimum O₃ Monitoring Requirements.

MSA population ^{1,2}	Most recent 3-year design value concentrations $\geq 85\%$ of any O ₃ NAAQS ³	Most recent 3-year design value concentrations $< 85\%$ of any O ₃ NAAQS ^{3,4}
>10 million	4	2
4 - 10 million	3	1
350,000 - <4 million	2	1
50,000 - <350,000 ⁵	1	0

¹ Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

² Population based on latest available census figures.

³ The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

⁴ These minimum monitoring requirements apply in the absence of a design value.

⁵ Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table D-4 of Appendix D to Part 58. PM_{10} Minimum Monitoring Requirements (Number of Stations per MSA)¹

Population Category	High Concentration ²	Medium Concentration ³	Low Concentration ^{4,5}
> 1,000,000	6-10	4-8	2-4
500,000 - 1,000,000.....	4-8	2-4	1-2
250,000 - 500,000.....	3-4	1-2	0-1
100,000- 250,000.....	1-2	0-1	0

¹ Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.

² High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more.

³ Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS.

⁴ Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM_{10} NAAQS.

⁵ These minimum monitoring requirements apply in the absence of a design value.

Table D-5 of Appendix D to Part 58. PM_{2.5} Minimum

Monitoring Requirements

MSA population ^{1,2}	Most recent 3-year design value $\geq 85\%$ of any PM _{2.5} NAAQS ³	Most recent 3-year design value $< 85\%$ of any PM _{2.5} NAAQS ^{3,4}
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - < 500,000 ⁵	1	0

¹ Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

² Population based on latest available census figures.

³ The PM_{2.5} National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

⁴ These minimum monitoring requirements apply in the absence of a design value.

⁵ Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Appendix I. Waiver for Second Wilmington Ozone Monitor



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

NOV - 9 2011

Ms. Shelia Holman
Director
Division of Air Quality
North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Ms. Holman:

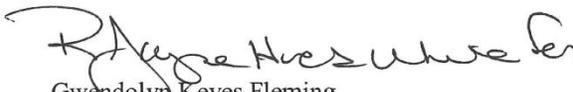
In a December 21, 2010, letter to you, the U.S. Environmental Protection Agency approved a waiver of the requirement that the state operate two ozone monitors in the Wilmington Metropolitan Statistical Area (MSA). At that time, EPA stated that it would re-evaluate the appropriateness of the waiver once EPA completed its reconsideration of the Ozone National Ambient Air Quality Standard (NAAQS).

On September 22, 2011, the Agency completed its reconsideration of the Ozone NAAQS and announced that the NAAQS would not change. This action left the Ozone NAAQS, which was promulgated in 2008, at a level of 0.075 parts per million (ppm).

Because the Wilmington MSA has a low risk for exceeding the 0.075 ppm NAAQS due to ambient air ozone concentrations which have been trending lower (i.e., decreasing design value), sea breezes, attainment status, and a population total that is only slightly over the threshold requirement for a second ozone monitor, EPA believes that the waiver of the second monitor is appropriate. The waiver is in effect until the next 5-year network assessment is completed and approved in 2015.

If you have any questions relating to this matter, please contact Katherine Snyder of my staff at (404) 562-9840.

Sincerely,


Gwendolyn Keyes Fleming
Regional Administrator

cc: Archie Lee, SESD



Internet Address (URL) • <http://www.epa.gov>

Appendix J. Request for Waiver from Longer Ozone Season for Mountain Sites



North Carolina Department of Environment and Natural Resources

Division of Air Quality

Beverly Eaves Perdue
Governor

Sheila C. Holman
Director

Dee Freeman
Secretary

December 21, 2011

Mr. Doug Neeley
Chief, Air Toxics and Monitoring Branch
U.S. Environmental Protection Agency Region IV
Sam Nunn Atlanta Federal Center
61 Forsyth Street S.W.
Atlanta, GA 30303-8960

Subject: Ozone Monitoring Season Exemption for High Elevation Sites

Dear Mr. ^{Doug}Neeley,

The current ozone monitoring season for North Carolina is April through October. EPA's proposed ozone rule would extend this season from March through October. Although the earlier start date is still just a proposal, North Carolina requests that the ozone season for our high elevation mountain sites remain at April through October.

Our concern is that the remote high elevation sites might not be accessible for a March start date. The roads are sometimes not passable, or closed by Federal or local authorities, well into March due to winter weather conditions (e.g., ice, snow, fallen trees or rocks, damage to the driving surface, etc.). The earlier start date would require us to get to the mountain tops in February to calibrate equipment and perform other quality assurance (QA) functions. Depending on the weather it may be possible in some years. In other years it is questionable whether we could do it safely, if at all.

The specific sites covered by this request, and their elevations above sea level:

- Joanna Bald (AQS site #37-075-0001) (4,688 ft)
- Purchase Knob (AQS site #37-087-0036) (5,085 ft)
- Frying Pan (AQS site #37-087-0035) (5,200 ft)
- Mt. Mitchell (AQS site #37-199-0004) (6,502 ft)
- Linville (AQS site #37-011-0002) (3,238 ft)

The current regulation, 40 CFR Part 58, Appendix D, Section 4.1(i) gives Region IV the authority to approve a deviation to the ozone monitoring season.

In EPA's "Guideline for Selecting and Modifying the Ozone Monitoring Season Based on an 8-Hour Ozone Standard" (EPA-454/R-98-001), it is noted:

1641 Mail Service Center, Raleigh, North Carolina 27699-1641
217 West Jones Street, Raleigh, NC 27603
Phone: 919-707-8401 / FAX 919-715-0718 / Internet: www.ncair.org

One
North Carolina
Naturally

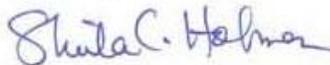
“For the initial formulation of the ozone monitoring seasons ... The basic premise was that areas with monthly mean maximum temperatures predominantly below 55 degrees Fahrenheit (F) are expected to have hourly concentrations less than 0.08 ppm ...”

North Carolina operates meteorology stations at two of the five sites, Joanna Bald and Linville. The monthly mean maximum temperature for March for 2007-2011 was 53°F at Joanna Bald and 55°F at Linville (the lowest elevation of the five sites). Additionally, data from the North Carolina State Climate Office shows the highest monthly mean maximum temperatures during the past four years to be to 44°F at Mt. Mitchell (the highest elevation). These maximum temperatures are about 9°F colder in February when we would be accessing these remote mountain areas to recalibrate equipment and perform other QA functions.

We do operate three of these sites year-round (Purchase Knob, Joanna Bald, and Frying Pan). But we cannot always get to the sites to perform QA functions during the winter, so we do not certify the off-season data. The monitors run simply to provide raw, unvalidated data for public information on the National Park Service’s Great Smoky Mountains National Park and U.S. Forest Service’s websites.

Thank you in advance for considering this request to exempt Joanna Bald, Purchase Knob, Frying Pan, Mt. Mitchell, and Linville from ozone monitoring earlier than April. Although the rule is not yet final, having this exemption in hand will ensure a measure of safety to our staff, and assist us in planning and managing our limited resources.

Sincerely,



Sheila C. Holman

cc:
Mike Abraczinskas
Donnie Redmond
Ryan Brown, EPA

Appendix K. Request for Exclusion of PM2.5 Continuous FEM data from Comparison to the NAAQS

Introduction:

The NC-DAQ monitoring program has historically operated PM2.5 continuous monitors primarily to support forecasting and reporting of the Air Quality Index (AQI). These monitors supply data every hour to update the AQI on our web site as well as on national web sites such as AIRNow (www.airnow.gov). We have been using these monitors since the early part of the last decade as we implemented the PM2.5 monitoring program. Over the last few years, a number of PM2.5 continuous monitors have been approved as Federal Equivalent Methods (FEMs). By utilizing an approved FEM, any subsequent data produced from the method may be eligible for comparison to EPA's health based standard known as the NAAQS. The primary advantage of operating a PM2.5 continuous FEM is that it can support both the AQI, while also supplying data that are eligible for comparison to the NAAQS. Thus, a network utilizing PM2.5 continuous FEMs can minimize the number of filter-based FRMs operated in the network, which are primarily used for comparison to the NAAQS. These filter-based FRMs are resource intensive in that they require field operations as well as pre- and post-sampling laboratory analysis which results in data not being available for approximately 2-4 weeks after sample collection.

Our monitoring program has been working with PM2.5 continuous FEMs including deployment at a few sites to evaluate their performance. Although the PM2.5 continuous FEMs are automated methods, these methods still require careful attention in their set-up, operation and validation of data. Once we were able to collect enough data we began to evaluate the performance of these methods compared to collocated FRMs. That evaluation is explained further below and includes our recommendations on the use of the data from these methods.

Request for Exclusion of PM2.5 Continuous FEM data from Comparison to the NAAQS:

In accordance with the PM NAAQS rule published on January 15th, 2013 (78 FR 3086) and specific to the provisions detailed in §58.10 (b)(13) and §58.11 (e) we are requesting that data from the following monitors be set aside for comparison to the NAAQS. While our agency is working to optimize the monitoring instrumentation we use to meet all of our monitoring objectives, we are not yet at a point where the comparability of the PM2.5 continuous FEMs operated in our network (*or a sub-set of our network*) compared to collocated FRMs is acceptable such that we are comfortable using the continuous FEM data for comparison to the NAAQS. We intend to continue working with the vendor to improve the continuous FEM performance, including revised procedures, software upgrades, or retrofit of improved components (as long as such changes do not void its FEM status). After assessing the comparability of the PM2.5 FEMs to the collocated FRMs for our network, we have determined that the sites listed below do not meet the comparability requirements. Detailed one-page assessments from which the information described below was obtained are included at the end of this section.

Table 52. Request for Exclusion of PM2.5 Continuous FEM Data

<i>Sites with PM2.5 continuous FEMs that are collocated with FRMs:</i>											
Site Name	City	Site ID	Cont POC	Method Description	PM2.5 Cont. Begin Date	PM2.5 Cont End Date	Continuous/FRM Sampler pairs per season	Slope (m)	Intercept (y)	Meets bias requirement	Correlation (r)
Kenansville	Kenansville	37-061-0002	3	Met One BAM-1020 Mass Monitor w/VSCC	3/1/2012	12/31/2013	Winter = 35 Spring = 53 Summer = 49 Fall = 59 Total = 196	1.07	2.20	No	0.87
Jamesville	Jamesville	37-117-0001	3	Met One BAM-1020 Mass Monitor w/VSCC	10/25/2012	12/31/2013	Winter = 34 Spring = 23 Summer = 28 Fall = 45 Total = 130	1.02	2.63	No	0.72
Castle Hayne	Castle Hayne	37-129-0002	3	Met One BAM-1020 Mass Monitor w/VSCC	10/23/2012	12/31/2013	Winter = 34 Spring = 30 Summer = 17 Fall = 41 Total = 122	1.05	2.93	No	0.79
Dillard School	Goldsboro	37-191-0005	3	Met One BAM-1020 Mass Monitor w/VSCC	11/1/2012	12/31/2013	Winter = 19 Spring = 29 Summer = 27 Fall = 36 Total = 111	1.10	1.81	No	0.93
<i>Sites with PM2.5 continuous FEMs that are not collocated with FRMs:</i>											
Site Name	City	Site ID	Cont POC	Method Description	PM2.5 Cont. Begin Date	PM2.5 Cont End Date					
Blackstone	Not in a City	37-105-0002	3	Met One BAM-1020 Mass Monitor w/VSCC	1/1/2014	12/31/2015					

Period of Exclusion of Data from the PM2.5 Continuous FEMs:

The above table details the period of available data by monitor for which we are basing our recommendation to exclude PM2.5 continuous FEM data. Per EPA Regional Office approval, we will load or move as necessary these data to EPA's AQS database in a manner where the data are only used for the appropriate monitoring objective(s) (i.e., use data for both the NAAQS and AQI, just the AQI, or neither the NAAQS or AQI). Additionally, we will continue to load any new data generated for the next 18 months (intended to represent the period until December 31 of 2015) in the same manner or until such time as we request and receive approval from the EPA Regional Office to change the monitoring objectives that the data from the PM2.5 continuous FEMs can support.

PM2.5 Continuous FEM data for Reporting the AQI:

While we are requesting the monitors above not be used for comparison to the NAAQS, we do believe that the data are of sufficient comparability to collocated FRMs that they be used in AQI reporting. Therefore, with EPA Regional Office approval we will report these data on our web site and to AIRNow (www.airnow.gov). Additionally, we intend to store the data in EPA's AQS database that is used for "acceptable AQI" reporting (i.e., parameter code 88502) so that data users will know that these data are appropriate for use in AQI calculations.

Continued Operation of PM2.5 Monitors to Support NAAQS and AQI Reporting

While we are requesting that data from the monitors listed above be set aside for comparison to the NAAQS, we will continue to operate PM2.5 FRMs to support the objective of comparison to the NAAQS. We will also operate our PM2.5 continuous monitors for use in AQI reporting. Each of these FRM and PM2.5 continuous monitors will be operated at the locations previously described in this plan and at the locations that meet the objectives of the Network Design Criteria for Ambient Air Quality Monitoring described in Appendix D to Part 58.

Assessments:

The one-page assessments provided as Figure 70 to Figure 73 are locations where our agency has collocated PM2.5 FRM and continuous FEM monitors. Each of these assessments is represented in "Table 52. Request for Exclusion of PM2.5 Continuous FEM Data" above.

PM_{2.5} Continuous Monitor Comparability Assessment

Site 37-061-0002: Kenansville, NC

FRM: R & P Model 2025 PM_{2.5} Sequential w/WINS-GRAVIMETRIC (118), PM_{2.5} - Local Conditions (88101), POC=1
 Cont: Met One BAM-1020 Mass Monitor w/VSCC-Beta Attenuation (170), PM_{2.5} - Local Conditions (88101), POC=3

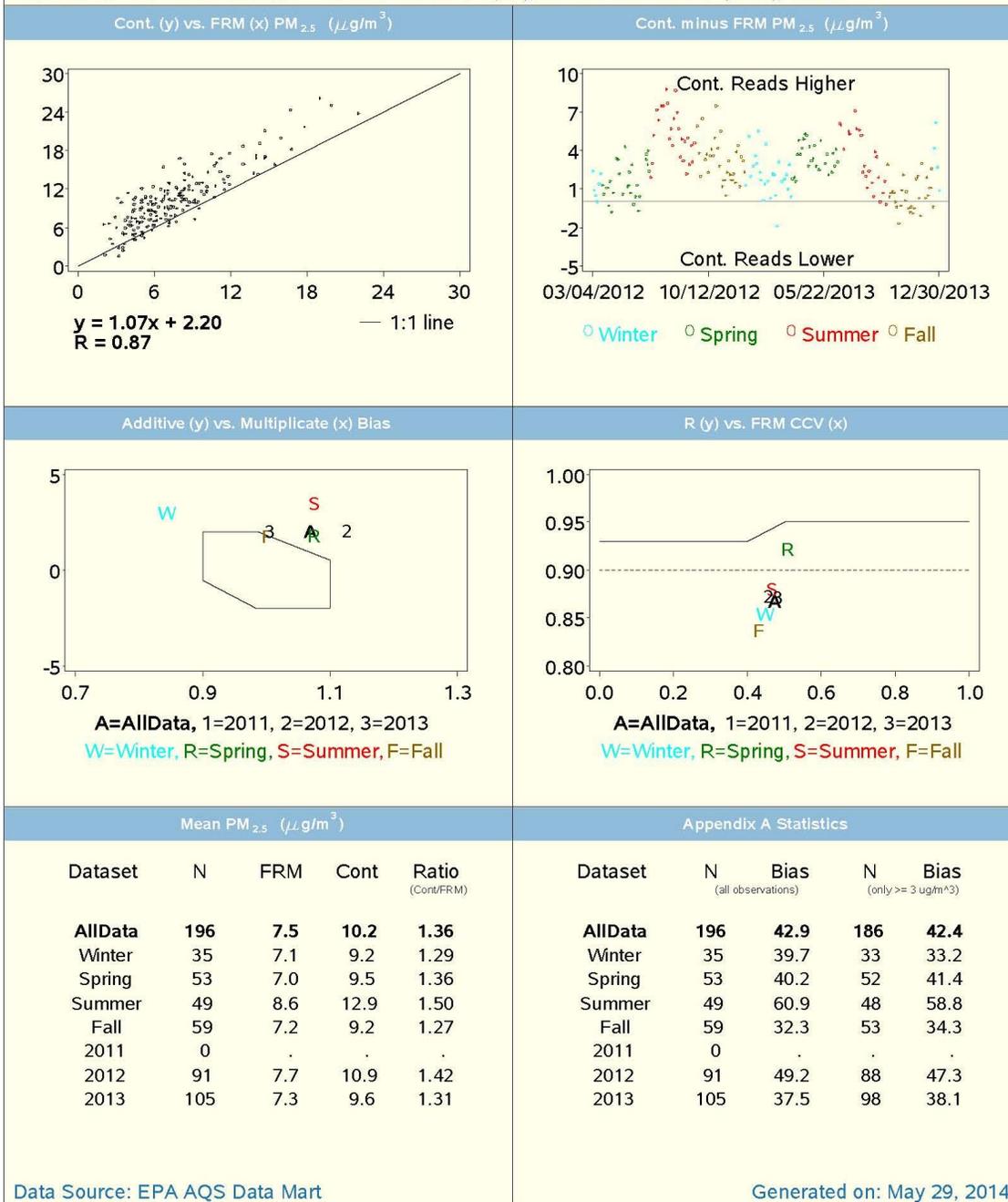


Figure 70. Comparison of the Beta Attenuation Monitor with the Federal Reference Monitor at Kenansville

PM_{2.5} Continuous Monitor Comparability Assessment

Site 37-117-0001: Jamesville, NC

FRM: R & P Model 2025 PM_{2.5} Sequential w/WINS-GRAVIMETRIC (118), PM_{2.5} - Local Conditions (88101), POC=1
 Cont: Met One BAM-1020 Mass Monitor w/VSCC-Beta Attenuation (170), PM_{2.5} - Local Conditions (88101), POC=3

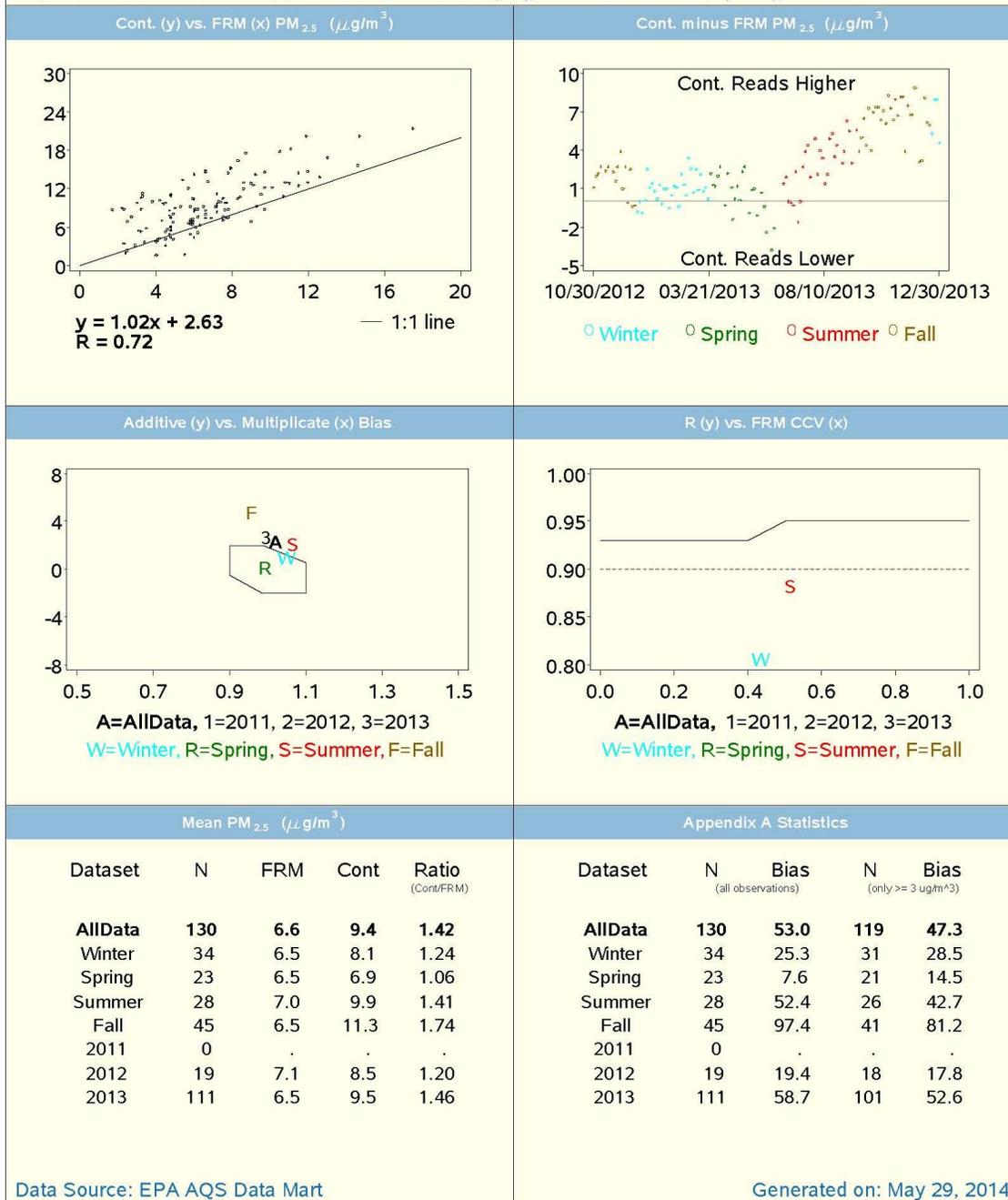


Figure 71. Comparison of the Beta Attenuation Monitor with the Federal Reference Monitor at Jamesville

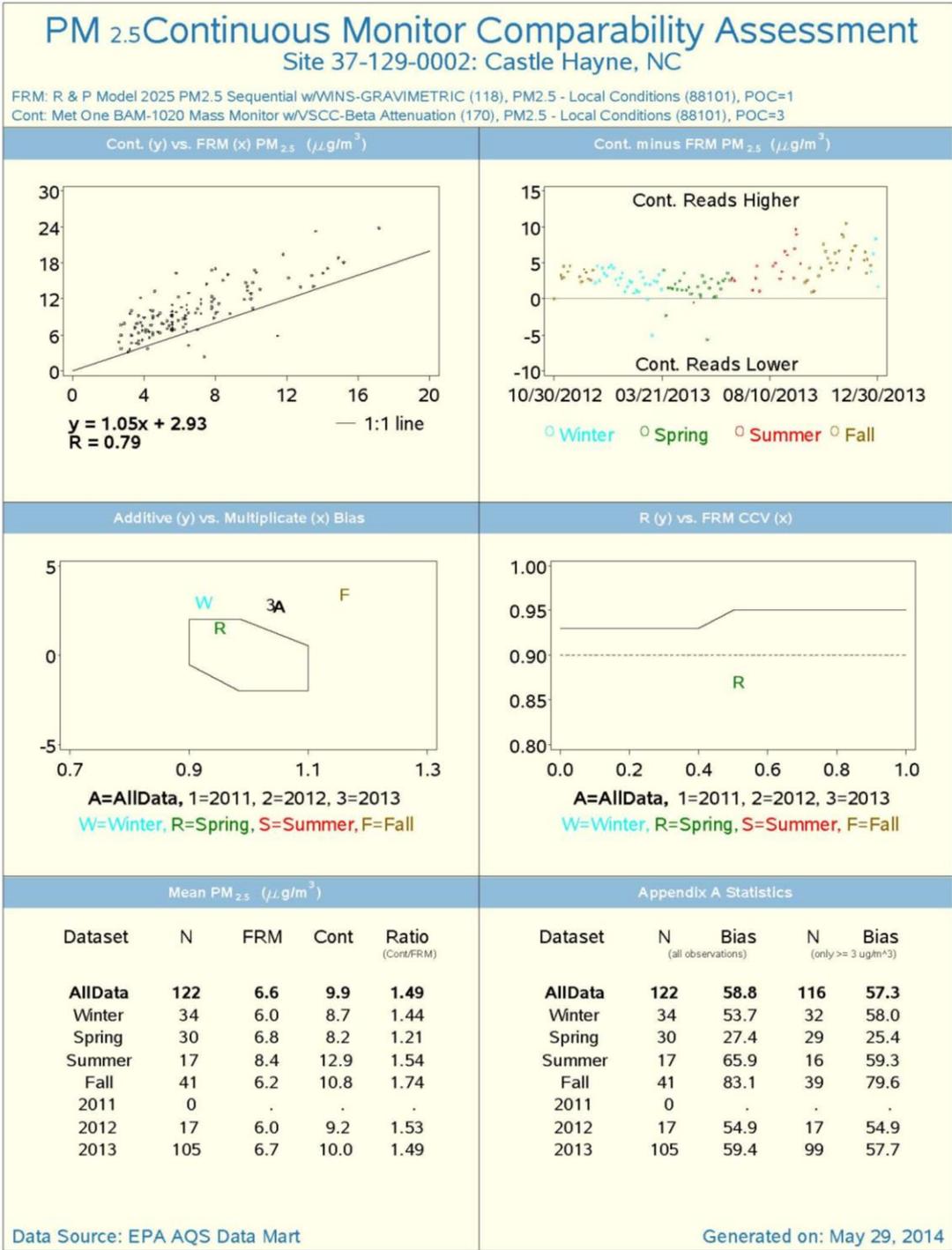


Figure 72. Comparison of the Beta Attenuation Monitor with the Federal Reference Monitor at Castle Hayne

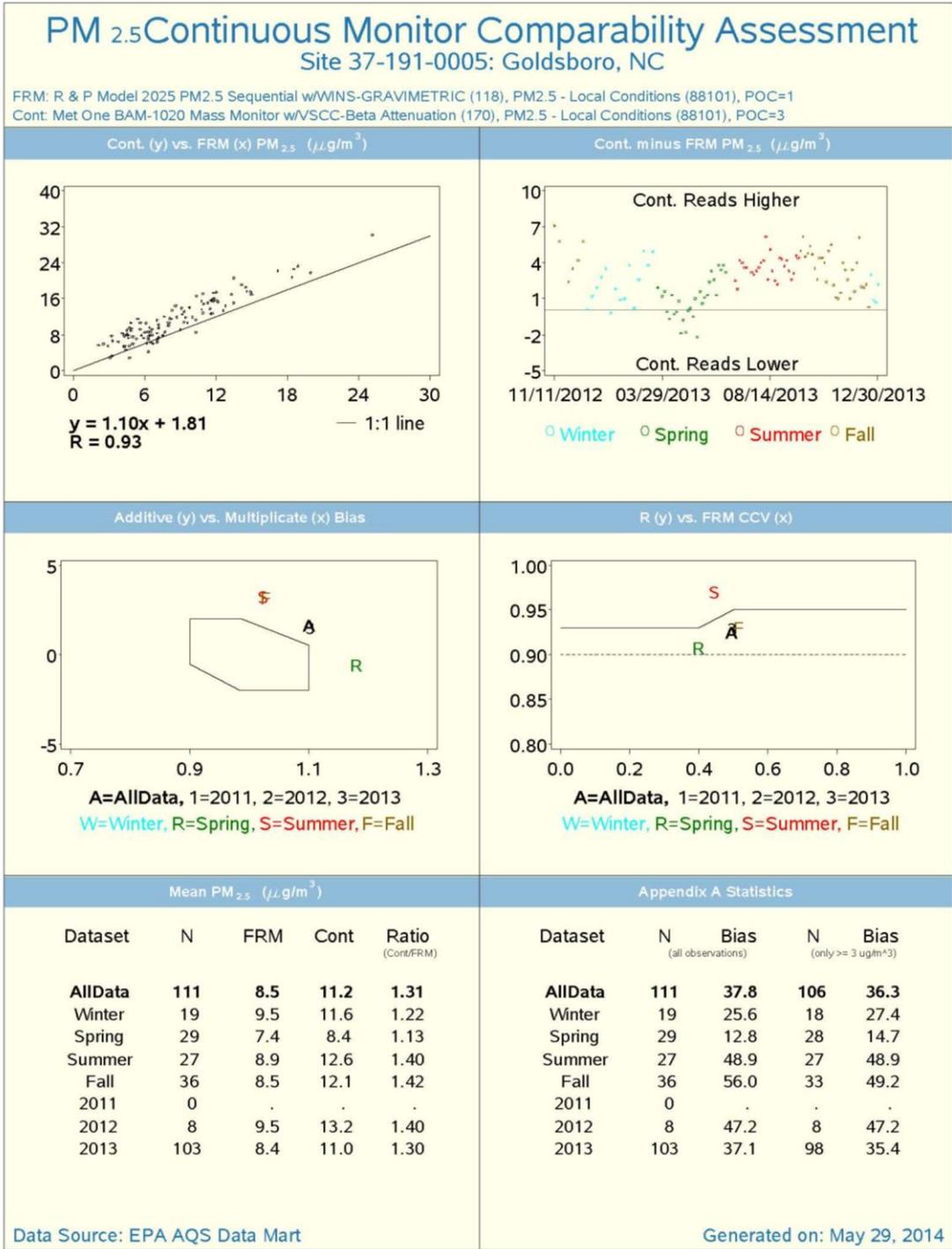


Figure 73. Comparison of the Beta Attenuation Monitor with the Federal Reference Monitor at Goldsboro

Appendix L. NCore Monitoring Plan Approval Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

*Donnie
C. Steile*

OCT 30 2009
RECEIVED
NOV 23 2009
AMBIENT P/L

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Keith Overcash, Director
Division of Air Quality
NC Department of Environment & Natural Resources
1641 Mail Service Center
Raleigh, NC 27699-1641

RECEIVED
NOV 6 2009
AIR QUALITY DIVISION
DIRECTORS OFFICE

Dear Mr. Overcash:

This letter transmits our approval of North Carolina's proposed NCore station at East Millbrook Middle School in Raleigh, AQS# 37-183-0014, as required by the Ambient Air Monitoring Regulations. According to these rules (see 40 CFR 58.11(c)), NCore network design and changes must be approved by the Environmental Protection Agency's (EPA) Administrator. This authority has been delegated to the Director of the Air Quality Assessment Division in EPA's Office of Air Quality Planning and Standards.

In considering your proposed NCore monitoring station, we worked with your Regional Office on a review of your annual monitoring network plan and an assessment of the proposed location and characteristics of the area to be monitored. After careful consideration of your proposal, we are pleased to approve this station as part of the NCore network.

In your agency's plan for NCore, a request was made to waive measuring NOy, which is a required measurement. After assessing available NOy observations and modeling outputs and to assure consistency across all NCore stations, we are affirming the requirement to measure NOy at all NCore stations. Please make arrangements with your Regional Office on a schedule to implement the measurement of NOy at your NCore station.

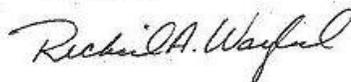
By EPA's rules (see 40 CFR 58.13), an approved NCore station is expected to be operating with all required measurements by January 1, 2011. Enclosure A provides an update on required measurements and Enclosure B provides EPA's Air Quality System instructions on coding for NCore monitors and data. Please share this information with your staff responsible for the NCore station measurements and data submission.

Internet Address (URL) • <http://www.epa.gov>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 25% Postconsumer)

Thank you for your program's efforts in developing the NCore station plan and establishing the site. For questions, you may contact Tim Hanley at hanley.tim@epa.gov and 919-541-4417, or David Shelow at shelow.david@epa.gov and 919-541-3776.

Sincerely,



Richard A. Wayland
Director
Air Quality Assessment Division

2 Enclosures

cc: Doug Neeley, EPA Region 4

Appendix M. Public Notice of Availability of Network Plan

Public notice of availability of the network plan was provided on the North Carolina Division of Air Quality website from August 26 through September 26, 2014. In addition, notification was sent out via public e-mail distribution lists maintained for permitting, rules, ambient monitoring and air toxics.

From: Burleson, Joelle
Sent: Wednesday, August 27, 2014 8:51 AM
To: Burleson, Joelle
Subject: NCDAQ annual air monitoring network plan update available for comment

Hello Air Quality Stakeholders:

NCDAQ's annual monitoring network plan update is posted on the web site and is open for public comment through September 26, 2014.

Here are links to the public notice and the summary page.

http://www.ncair.org/monitor/monitoring_plan/Annual_Monitoring_Plan_Public_Notice-2014-2015.shtml

http://www.ncair.org/monitor/monitoring_plan/new_plan/

Have a nice day.

Joelle Burleson, EIT, CPM, Supervisor
Planning Section, Rules Development Branch
NC DENR, Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641
Phone/Fax: 919-707-8720
www.ncair.org
joelle.burleson@ncdenr.gov

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties unless the content is exempt by statute or other regulation.

From: Gatano, Betty
Sent: Wednesday, September 03, 2014 2:00 PM
To: NCDENR.DENR.DAQ.Stakeholders.Outside_Involvement_Committee
Cc: Steger, Joette
Subject: Notice of Public Comment Period on changes to the Ambient Air Quality Monitoring Network

**North Carolina Department of Environment and Natural Resources
North Carolina Division of Air Quality
Public Notice**

Changes to the division's Ambient Air Quality Monitoring Network planned during 2014 and 2015 will be available for public comments from August 26 to September 26, 2014. The proposed changes are required to be submitted to the U.S. Environmental Protection Agency (EPA) annually.

INFORMATION: The Ambient Air Monitoring Annual Network Monitoring Plan will be posted for 30 days on the division's website at www.ncair.org starting on Tuesday, August 26, 2014. It will also be available for review at the Division of Air Quality Raleigh Central Office located at 217 West Jones Street, Raleigh, North Carolina. Copies may also be obtained from Donnie Redmond at the address below.

COMMENT PROCEDURES: All persons interested in these matters are invited to comment. Email comments to: DENR.DAQ.Ask_Ambient@lists.ncmail.net or mailed to:

Donnie Redmond
NC Division of Air Quality
1641 Mail Service Center
Raleigh, North Carolina 27699-1641
(919)-707-8468
(919)-707-8468 Fax

From: Davis, Charles
Sent: Wednesday, September 03, 2014 3:09 PM
To: Davis, Charles
Cc: Steger, Joette; Redmond, Donnie
Subject: 2014-2015 North Carolina Division of Air Quality Annual Ambient Air Quality Monitoring Plan

Good Afternoon

The North Carolina Division of Air Quality's Mission is to protect and improve outdoor, or ambient, air quality in North Carolina for the health, benefit and economic well-being of all. To carry out this mission, the DAQ operates a statewide air quality monitoring network to measure the level of pollutants in the outdoor air, develops and implements plans to meet future air quality initiatives, assures compliance with air quality rules, and educates, informs and assists the public with regard to air quality issues. A major aspect of this complex task is the evaluation of our air quality monitoring network and effort to ensure we are meeting the goals of our mission.

I thought you might be interested in reviewing and possibly commenting on the North Carolina Division of Air Quality 2014-2015 Annual Monitoring Network Plan. The Network Plan is accessible via the links below. All comments are due by September 26, 2014.

Charles Davis
NCDAQ – Ambient Monitoring Section

2014-2015 Annual Monitoring Network Plan for North Carolina Air Quality

The North Carolina Division of Air Quality (DAQ) operates a network of air quality monitors across the state. The network, consisting of over 100 monitors at more than 50 sites, measures the concentration of regulated pollutants in the ambient (outdoor) air. These pollutants include ozone, lead, fine particles, nitrogen oxides, sulfur dioxide and carbon monoxide. The measured concentrations are compared to the National Ambient Air Quality Standards (NAAQS) as set by the U.S. Environmental Protection Agency or EPA. If violations of these federal standards are detected, the DAQ takes regulatory action to return the ambient air quality to acceptable levels.

Every year the monitoring network is re-evaluated and adjusted to ensure it is providing adequate coverage. In most years these adjustments include starting new monitors, shutting down others, or simply relocating established monitors. The proposed annual network plan is subject to a 30-day public review period prior to being submitted to EPA for approval.

This year's plan includes more changes than usual. This is a reflection of a shift in monitoring emphasis, with some pollutants becoming less of a concern

and others becoming higher priority.

A number of major air pollution control programs have been implemented over the past 10 years, including the Clean Smokestacks Act passed by the North Carolina General Assembly in 2002. Under the act, coal-burning power plants were required to reduce their nitrogen oxide emissions by 77 percent by 2009 and sulfur dioxide emissions by 73 percent in 2013. Those significant emissions reductions have been achieved, and we are seeing the benefits in cleaner air - concentrations of ozone and fine particles are at the lowest levels ever measured in North Carolina.

At the same time, other pollutants are emerging as needing more attention. Specifically, the federal standards for sulfur dioxide (SO₂) have been tightened, which results in the pending need for additional SO₂ monitoring. The potential for shale gas development in North Carolina has made that a new priority, as well.

Last year's network plan saw the first signs of this shift in emphasis, as we shut down three fine particle monitoring sites and one ozone monitor. We also established two significant new monitoring sites in 2013. The near-road site (Triple Oak) in Raleigh is the first ever specifically intended to capture concentrations extremely close to a major roadway (I-40). We also established a new site (Blackstone) and additional monitors at other sites (Candor and Millbrook) to specifically monitor baseline conditions prior to shale gas development.

This year's network plan continues that shift in monitoring emphasis. The new plan shuts down six additional fine particle sites and three more ozone sites. But we are also establishing two new SO₂ sites and are planning for an expansion of SO₂ monitoring during the next two years. We believe the attached network plan offers the best balance of monitoring the highest priority air pollutants within our available resources. Although not noted in the network plan, we are also directing resources towards upgrading the infrastructure at existing sites and modernizing our remaining fleet of fine particle and ozone monitors.

The monitors recommended to be shut down include:

- Fine particles (PM_{2.5}), after December 31, 2014
 - Colfax (Gulford Co.)
 - Dillard (Wayne Co.)
 - Grier (Gaston Co.)
 - Hopedale (Alamance Co.)
 - Linkhaw (Robeson Co.)
 - Pittsboro (Chatham Co.)
- Ozone, after October 31, 2014
 - Bushy Fork (Person Co.)
 - Franklinton (Franklin Co.)
 - Mocksville (Davie Co.)

As detailed in the network plan, the ambient concentrations measured by these monitors are well below the standard, are expected to remain well below the standard, and there is no EPA requirement to continue operating the monitors.

2014-2015 Annual Monitoring Network Plan - Volume 1 - By Pollutant

By Division of Air Quality Regional Office:

- Asheville
- Winston-Salem
- Mooresville
- Raleigh
- Fayetteville
- Washington
- Wilmington

Network Changes for 2014-2015 Monitoring network changes for 2014-2015 are described in the 2014 monitoring network plans. The State program and local program plans are provided here. The Western NC (Buncombe County) program plan is included within the state agency's plan. This document is updated annually, with a 30-day public comment period from August 26 to September 26. Email comments to: DENR.DAQ_Ask_Ambient@lists.ncmail.net.

[Direct contact information for the local program agencies.](#)

- [2014-2015 Public Notice for Annual Monitoring Network Plan for North Carolina Air Quality](#)
- [2014-2015 Annual Monitoring Network Plan for North Carolina Air Quality](#)
- [2014-2015 Annual Monitoring Network Plan for Mecklenburg County Air Quality](#)
- [2014-2015 Annual Monitoring Network Plan for Forsyth County Air Quality](#)

Charles O. Davis III, Chemist
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Fax: 919-707-8454

www.ncair.org
charles.o.davis@ncdenr.gov

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<p>EPA Comment Period Ends for Pactiv LLC (Greensboro) Air Quality Permit (Russell Braswell)</p> <p>EPA Comment Period Ends for Stanley Furniture Company, Inc. (Robbinsville) Air Quality Permit (Russell Braswell)</p> <p>Public Comment Period Ends for Jackson Paper Manufacturing Company (Sylva) Air Quality Permit (Betty Gatano)</p>				
<p>18 EPA Comment Period Ends for Century Furniture (Hickory) Air Quality Permit (Russell Braswell)</p> <p>Public Comment Period Ends for Cone Denim, LLC (Greensboro) Air Quality Permit (Russell Braswell)</p>	<p>19 Public Comment Period Begins Pre-hearing Draft of the Regional Haze SIP Revision for North Carolina Class I Areas</p>	<p>20 Public Notice of Intent to Issue an Air Quality Permit to Baxter Healthcare Corporation (Marion) (Brian Bland)</p> <p>Baxter (Draft Permit)</p> <p>Baxter (Permit Rev.)</p> <p>EPA Comment Period Begins for Baxter Healthcare Corporation (Marion) Air Quality Permit (Brian Bland)</p>	<p>21 Public Notice of Intent to Issue an Air Quality Permit to Perdue Agribusiness, LLC (Cofield) (Heather Sands)</p> <p>Perdue Agribusiness, LLC (Draft Permit)</p> <p>Perdue Agribusiness, LLC (Permit Rev.)</p> <p>EPA Comment Period Begins for Perdue Agribusiness, LLC (Cofield) Air Quality Permit (Heather Sands)</p>	<p>22 Public comment period begins for N. S. Flexibles Special Order by Consent</p>
<p>25 EPA Comment Period Ends for Jackson Paper Manufacturing Company (Sylva) Air Quality Permit (Betty Gatano)</p>	<p>26 Public Comment Period Begins NC DAQ 2014-2015 Monitoring Plan</p>	<p>27</p>	<p>28 EPA Comment Period Ends for Domtar Paper Company, LLC (Plymouth) Air Quality Permit (Heather Sands)</p>	<p>29</p>

Note: Links to Public Notices, Draft Permits, and Permit Reviews are removed once the corresponding permit is issued. Entries shown on calendar for issued permits are for reference only. Please contact Kathy Hash, DAQ Permitting at 919-707-8734 or Kathy.Hash@ncdenr.gov for information on these entries.



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- North Carolina asks for extension of public comment period on carbon rules (08/14/2014)
- State air quality director speaks at EPA public hearing on carbon rules (07/31/2014)
- DAQ Recognizes Employee, Team of the Year for 2013 (05/19/2014)

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Other Items of Interest

- ☞ **NEW** Governors letter to President Obama on concerns about proposed carbon dioxide standards
- ☞ **NEW** NC Clean Air Act Section 110(l) Demonstration for Repeal of Transportation Facilities Rules
- ☞ **NEW** 2014-2015 Annual Monitoring Network Plan for NC Air Quality
- ☞ **NEW** 2014 Diesel Emission Reduction Grant - Request for Applications
- ☞ **NEW** NCDENR requests extension for comments on carbon rules
- ☞ **NEW** NCDENR Comments on EPA's Proposed Rules Under §111(d)
- ☞ EPA's Power Sector Carbon Pollution Standards
- ☞ Air Quality Outreach Events
- ☞ DAQ Website Changes
- ☞ EPA Clean Power Plan for Carbon Pollution 
- ☞ DENR Section 111(d) Principles Document
- ☞ North Carolina's ozone levels lowest on record in 2013
- ☞ 2014 APU Rebates Now Available
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Appendix N. Public Comments Received

Two public comments were received. No changes were made to the network plan after it went out for public comment other than to correct errors and add information on public notice and public comments received (Appendices M and N).

DAQ believes Region 4 has the authority to approve discontinuance of the monitors recommended to be shut down.

A commenter is correct that the monitors do not meet the requirements of 40 CFR §58.14(c)(1) for automatic discontinuation. However, the previous paragraph of that same rule allows EPA to discontinue the monitors on a case-by-case basis:

“Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part, if any, continue to be met.” 40 CFR §58.14(c)

We believe we meet the requirements for case-by-case approval on both counts of this provision.

First, we exceed the appendix D requirements for both ozone and PM2.5. Tables included in the network plan identify the number of monitors required by appendix D and the actual number of monitors operated:

- Table 16, Design Values and Required Ozone Monitors for North Carolina Metropolitan Statistical Areas (MSA) (p. 49)
- Table 27, Design Values and Required Fine Particle Monitors for North Carolina Metropolitan Statistical Areas (MSA) (p. 94)

These tables document that we exceed the appendix D requirements.

Next, EPA can approve the request “if discontinuance does not compromise data collection needed for implementation of a NAAQS.” Figures included in the network plan show broad geographical distribution of both ozone and fine particle monitors:

- Figure 44, Location of 2014 Ozone Monitoring Stations (p. 61)
- Figure 62, Locations of 2014 FRM/FEM Fine Particle Monitoring Stations (p.97)

These maps show that, in addition to exceeding the appendix D requirements, the monitors are geographical dispersed across the entire state. Thus, there are no gaping “holes” that would compromise implementation of a NAAQS.

Additionally, discontinuing these monitors is in line with EPA’s recent discussions on network sizes.

- Region 4 has hosted several meetings with southeastern air directors regarding inadequate funding of the PM2.5 network -- with the clear understanding that a reallocation of the 103 grant funding would result in the discontinuance of some number of existing PM2.5 monitors.

- EPA itself decided to discontinue funding the chemical speciation network (CSN) monitors in this plan.
- Regarding the three ozone sites recommended for shutdown, ozone concentrations at each site continue to decrease:

Monitor	2011-2013 DV	Projected 2012-2014 DV*	2014's 4 th highest value to date*
Bushy Fork	69	66	65
Franklinton	68	64	62
Mocksville	69	67	65

*non-QA'd data, through mid-September 2014

- DAQ also notes that there have been zero ozone exceedances at any monitor in North Carolina in 2014 to date, and there was only one in all of 2013. The ozone seasons in 2013 and 2014 represent the lowest number of exceedances observed since the state began monitoring ozone.

Regarding other comments:

- There is no active fracking in North Carolina, nor is there an EPA requirement for monitoring such activity. Nonetheless, DAQ has established a multi-pollutant site (Blackstone) in the area deemed most likely to experience shale gas development. Blackstone's specific purpose is to measure background concentrations of various pollutants prior to and after any actual activity.
- Three PM_{2.5} sites were mentioned as being near interstate corridors. However, each site is at least one mile from the nearest interstate, so they are not believed to be significantly influenced by the interstate traffic. The DAQ and Mecklenburg County, respectively, have established actual near-road sites in Raleigh and Charlotte at distances of 20 meters and 30 meters from high-traffic volume segments of interstate highway. PM_{2.5} will be measured at these near-road sites in accordance with EPA regulations, beginning in January 2017.

Conclusion: DAQ has done a comprehensive review of the ambient network and believes the recommended changes are appropriate. DAQ believes the resulting network for 2015 is adequate for characterizing the air quality across North Carolina and for protecting the health of the citizens of the state.

From: Gayatri Ankem [gayatri@cleanaircarolina.org]
Sent: Friday, September 26, 2014 1:50 PM
To: NCDENR, DENR, DAQ, Ask_Ambient
Subject: 2014-2015 Annual Monitoring Network Plan comments by MAHA
Attachments: MAHA comments 2014-2015 NCDAQ Annual Ambient AQ MonitoringPlan.pdf; MAHA comments 2014-2015 NCDAQ Annual Ambient AQ MonitoringPlan.docx

Dear DENR officials,

I am Gayatri Ankem, Manager of Medical Advocates for Healthy Air (MAHA). I am writing on behalf of MAHA because we are very concerned about eliminating the monitors under 2014-2015 Annual Monitoring Network Plan. Please see the attached document for our comments on 2014-2015 Annual Monitoring Network Plan. I have also added the same below in the text for your reference. Please consider our remarks and concerns before you would finalize the plan.

Thank you
Sincerely
Gayatri Ankem, MPH

Triangle Manager, Medical Advocates for Healthy Air
Clean Air Carolina
309-212-6309
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As medical and health professionals who work and live in North Carolina, Medical Advocates for Healthy Air is extremely concerned about removal of particulate matter and ozone monitors under the new 2014-2015 NC DAQ Annual Ambient AQ Monitoring Plan.

Over 1.3 million people in our state suffer from asthma, COPD and cardiovascular disease. Among them, children are being affected disproportionately. One out of every ten children in North Carolina has asthma (NC Department of Health and Human Services). While clean air is essential for all children's developing lungs, it's especially critical for those children with asthma. With our state's planned population growth and the continued growth of our industry, business, and transportation sectors, it is critical that we retain these monitoring sites in order to ensure the health of North Carolinians. Having these monitoring safeguards in place alerts us of changes as they happen and help prevent and isolate systemic and localized pollution events.

As fracking for natural gas is set to begin next year, monitoring of air quality is more crucial than ever. For instance, the Pittsboro (Chatham County) monitor, scheduled for elimination, is located in a region identified for potential fracking. Ozone and particulate matter are pollutants of major concern at fracking sites, as seen in other states where fracking is already occurring. Ozone exposure is known to exacerbate many adverse health conditions, particularly respiratory (asthma) as well as cardiovascular. The adverse health outcomes due to particulate matter cover cradle to grave health consequences, such as pre-term birth, low birth weight, heart attacks, strokes, decreased lung function and diabetes.. Removal of these monitors will only dampen the states constitutional commitment to clean air resources.

In North Carolina, mobile sources like cars, trucks, buses, and off-road equipment are the largest sources of particulate matter. Therefore, there is an urgent need for monitoring particulate matter near highways and interstate corridors. Unfortunately, many particulate matter monitors that are scheduled to be eliminated are near roads and interstate corridors:

- a. The Colfax (Guilford County) monitor is along the critical I-40 transportation corridor.
- b. The Grier (Gaston County) monitor is along the critical I-85 transportation corridor which is experiencing extraordinary growth in population, industry and average vehicle miles traveled.
- c. The Hopedale (Alamance County) monitor is located along the critical I-40 corridor.

Additionally, some of the monitors to be eliminated are located in the counties with worse health outcomes, such as Linkhaw (Robeson County) and Hopedale (Alamance County). Furthermore, Linkhaw is adjacent to a major emission source of particulate matter pollution in Columbus County, a county with the "worst" health ranking and "zero" number of monitors. With the implementation of new fine particulate matter standards on the horizon we will need these monitors sooner than later. The data being collected by these monitors are not just random numbers. They highlight the burden being placed on our children and other vulnerable populations resulting in more suffering, higher healthcare costs, and missed school and work days. Please consider our concerns before making your final decision.



From: Myra Blake [mblake@selcnc.org]
Sent: Friday, September 26, 2014 5:01 PM
To: NCDENR.DENR.DAQ.Ask_Ambient
Cc: Mary Maclean Asbill; John Suttles
Subject: Comments on DAQ's 2014-2015 Annual Monitoring Network Plan
Attachments: 2014-09-26 Comments on NC 2014-2015 Air Monitoring Plan FINAL.pdf; Attachment A - Klafka Report, 12-05-12.pdf; ATT00001.c

Mr. Redmond:

The Southern Environmental Law Center, on behalf of itself, the North Carolina Conservation Network, the North Carolina League of Conservation Voters, the Sierra Club, the Southern Alliance for Clean Energy, and the Western North Carolina Alliance, respectfully submits the attached comments on the proposed 2014–2015 Annual Monitoring Network Plan for the North Carolina Division of Air Quality (“DAQ”). We appreciate the opportunity to submit these comments.

Sincerely,
Myra Blake

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Donnie Redmond
NC Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Comments on the Proposed North Carolina 2014-2015 Annual Monitoring Network Plan for the North Carolina Division of Air Quality

Dear Mr. Redmond:

The Southern Environmental Law Center, on behalf of itself, the North Carolina Conservation Network, the North Carolina League of Conservation Voters, the Sierra Club, the Southern Alliance for Clean Energy, and the Western North Carolina Alliance (collectively, the “Conservation Groups”), respectfully submits the following comments on the proposed 2014–2015 Annual Monitoring Network Plan for the North Carolina Division of Air Quality (“DAQ”).

The Conservation Groups are concerned that DAQ’s proposal to shutter a substantial number of monitors—particularly ozone and fine particle pollution monitors—will keep the public and the agency in the dark about pollution increases in areas with historically poor air quality. Many of the monitors slated for shutdown are federally required based on the high pollution levels recorded by these monitors in recent years, and therefore cannot and should not be removed. Removal of these monitors will also make it more difficult to tell if these areas are attaining the new, lower standards for ozone and fine particles. EPA has promulgated a lower standard for fine particles and plans to promulgate a lower standard for ozone, in response to substantial scientific and medical evidence that these pollutants cause health problems at even lower concentrations than previously thought. In addition, these monitors are necessary to protect people in areas near major pollution sources that have generated high concentrations of pollutants for years. Without these monitors, areas could slide back into nonattainment unnoticed. Finally, DAQ’s proposal to replace ozone and fine particle monitors with sulfur dioxide monitors is misguided, since sources of sulfur dioxide are also generally major sources of fine particles and ozone precursors. In addition, modeling of sulfur dioxide is less expensive and often better for determining violations, and already exists for key locations in North Carolina. For these reasons, the Conservation Groups urge the agency to leave existing monitors in place to help inform and protect the public.

Summary of the Annual Monitoring Network Plan

DAQ's proposed monitoring plan would remove significantly more monitors this year as compared to years past, leaving more communities without assurance that their air is safe to breathe. Under the proposed monitoring plan, the following monitors would be shut down:

- Ozone ("O₃"), after October 31, 2014
 - Bushy Fork (Person Co.)
 - Franklinton (Franklin Co.)
 - Mocksville (Davie Co.)
- Fine particles ("PM_{2.5}"), after December 31, 2014
 - Board of Education (Buncombe Co.)
 - Colfax (Guilford Co.)
 - Dillard (Wayne Co.)
 - Grier (Gaston Co.)
 - Hopedale (Alamance Co.)
 - Linkhaw (Robeson Co.)
 - Pittsboro (Chatham Co.)
- Coarse particles ("PM₁₀"), after December 31, 2014
 - Hickory (Catawba Co.)
- Speciation, after December 31, 2014
 - Rockwell (Rowan Co.)
 - Lexington (Davidson Co.)
 - Hickory (Catawba Co.)

I. It Is Critical to Measure Concentrations of Fine Particles and Ozone, Which Cause an Array of Serious Health Problems.

The majority of the monitors that DAQ plans to remove are those that measure fine particles and ozone. Fine particles, one of the most deadly forms of air pollution, are a significant cause of premature death from heart disease and lung disease, and are associated with 2.1 million premature deaths each year world-wide.¹ Fine particles also cause health problems such as heart attacks, asthma attacks, decreased lung function, and bronchitis. Decreases in fine particle concentrations add months, if not years, onto people's lives.² Studies show that, in major cities like Charlotte and Raleigh, decreases in fine particle concentrations are responsible for 15% of increased life expectancy in recent decades.³

Ground-level ozone, also commonly known as smog, is formed by photochemical reactions between nitrogen oxides ("NO_x") and volatile organic compounds ("VOCs") in the presence of heat and sunlight. High ozone days thus occur seasonally during hot, stagnant

¹ See Raquel A. Silva et al., *Global Premature Mortality Due to Anthropogenic Outdoor Air Pollution* 2013 *Envtl. Res. Letters* 8, available at <http://iopscience.iop.org/1748-9326/8/3/034005/article>.

² See C. Arden Pope III et al., *Fine-Particulate Air Pollution and Life Expectancy in the United States*, 360(4) *New Eng. J. Med.* 2009 376, 382-84 (2009), available at <http://www.nejm.org/doi/pdf/10.1056/NEJMsa0805646>.

³ *Id.*

summer months. Major sources of NO_x and VOCs include coal-fired power plants, large industrial facilities, motor vehicle exhausts, and gasoline and solvent vapors. While high ozone concentrations most frequently occur in urbanized areas, due to large aggregations of industrial and mobile source emissions, ozone can be transported long distances by wind. As a result, rural areas that lack large industrial facilities and significant numbers of motor vehicles can also experience high ozone levels.

Ozone exposure leads to premature death and a host of breathing problems, including coughing, sore throats, damage to the lungs, and aggravation of asthma, emphysema, and chronic bronchitis. People with heart and lung disease, older adults, children, and people who are active outdoors are especially susceptible to the problems caused by both ozone and fine particle exposure.

There is no evidence of a safe level of exposure for ozone and fine particles, meaning that both of these pollutants have health effects even at concentrations below the established National Ambient Air Quality Standards (“NAAQS”). *See Am. Trucking Associations, Inc. v. EPA*, 283 F.3d 355, 360 (D.C. Cir. 2002) (internal quotation marks and alterations omitted) (recognizing that the “lack of a threshold concentration below which [particulate matter and ozone] are known to be harmless makes the task of setting primary NAAQS difficult,” since “a zero-risk standard is not possible”); National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3086, 3098 (Jan. 15, 2013) (explaining that there is “no population threshold, below which it can be concluded with confidence that PM_{2.5}-related effects do not occur”); Brief of Appellee State of North Carolina at 17, 62–64, *North Carolina v. TVA*, 615 F.3d 291 (4th Cir. 2010) (No. 09-1623) (explaining that “NAAQS are not designed to be fully protective,” and that arguments to the contrary “ignore[] the testimony of North Carolina’s public health expert, who provided ample evidence to support the court’s findings of fact on health impacts at the population level below the NAAQS” (citations omitted)).

As scientific and medical evidence has demonstrated greater risks of harm at lower levels and durations of exposure, EPA has strengthened the ozone standard over time: in 1997, it lowered the standard to 80 ppb, and again in 2008 to 75 ppb. Based on the wealth of evidence of health problems caused by ozone at low levels, EPA’s Clean Air Science Advisory Committee recently recommended lowering the 8-hour ozone standard from 75 parts per billion (ppb) to 60–70 ppb.⁴ The Committee cautioned that even a revised limit as high as 70 ppb would provide “little margin of safety for the protection of public health, particularly for sensitive subpopulations.”⁵ EPA has also strengthened the fine particle standard over time in response to mounting scientific evidence of health problems caused by this pollutant. Most recently, EPA lowered the annual fine particle standard to 12 micrograms per cubic meter (“ug/m³”).

⁴ *See* Letter from Dr. H. Christopher Frey, Chair, Clean Air Scientific Advisory Committee, to Gina McCarthy, Administrator, U.S. EPA (June 26, 2014), *available at* [http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/\\$File/EPA-CASAC-14-004+unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/$File/EPA-CASAC-14-004+unsigned.pdf).

⁵ *Id.* at ii.

II. Federal Requirements Prohibit DAQ from Removing Certain Ozone and Fine Particle Monitors.

DAQ's proposed plan would impermissibly remove ozone and fine particle monitors that are federally required to remain in operation due to poor air quality conditions detected by the monitors in recent years, and due to an elevated risk of future air quality violations. Under federal protections, monitors that are part of the State and Local Air Monitoring Stations ("SLAMS") system cannot be shut down if they have measured an exceedance of the NAAQS in the past five years,⁶ or if past readings indicate that there is more than a 10% chance of exceeding 80% of the NAAQS in the next three years. 40 C.F.R. § 58.14(c)(1). EPA has developed the following formula for calculating whether a monitor shows more than a 10% chance of exceeding 80% of the NAAQS in the next three years:

$$\bar{X} + \frac{t * s}{\sqrt{n}} < 0.8 * NAAQS$$

Where \bar{X} is the average design value for the last 5 years (or more), t is the student's t value for $n-1$ degrees of freedom at the 90% confidence level [for 5 years of data, this value is 2.13], s is the standard deviation of the design values, n is the number of records (i.e., number of design values), and NAAQS is the relevant standard.⁷ For ease of reference, this formula is referred to in these comments as "EPA's risk test," and the value resulting from the left side of the equation (i.e., the monitor-specific value that is compared to the 80% NAAQS value on the right side of the equation) is referred to as the monitor's "risk value."

Many of the monitors that DAQ is attempting to remove under the proposed plan fail to meet one or both of the requirements described above, and therefore cannot legally be removed. 40 C.F.R. § 58.14(c)(1).⁸

The Bushy Fork SLAMS monitor in Person County has measured ozone levels that are too high to allow its removal. Applying EPA's risk test for determining whether there is an impermissible likelihood of exceeding the NAAQS in the next three years, the resulting risk value for the Bushy Fork monitor is 73.7 ppb—much higher than the required value of less than 60 ppb (80% of the current ozone NAAQS). For this reason, the Bushy Fork monitor does not meet federal shutdown requirements, and cannot be removed. DAQ purports to justify removal of the Bushy Fork monitor on the basis that the ozone measurements at this site correlated with those at the Cherry Grove site in 2013. However, there is no regulatory support for this justification. The regulations provide that a monitor may be removed only if it has consistently

⁶ Compliance with the NAAQS is based on the "design value" for each pollutant. For ozone, the design value is calculated as the 4th-highest 8-hour ozone measurement each year, averaged over three years.

⁷ See EPA Network Assessment Guidance (2007), available at <http://www.epa.gov/ttr/na/1/files/ambient/pm25/data/mang/network-assessment-guidance.pdf>.

⁸ Removal of CO, PM₁₀, SO₂, or NO₂ monitors that do not meet these requirements may be allowed, but only if they have consistently measured lower concentrations than another monitor for the same pollutant in the same county—and this exception does not apply to ozone or fine particle monitors. 40 C.F.R. § 58.14(c)(2).

measured lower concentrations than another monitor for the same pollutant in the same county. 40 C.F.R. § 58.14(c)(2). Such is not the case here. DAQ’s finding that the Bushy Fork monitor readings “correlate” with those at the Cherry Grove site does not demonstrate that the measurements at either site are consistently lower than the other and, thus, does not satisfy the regulatory requirements for removing either monitor. Moreover, DAQ’s reliance on this exception is misplaced, since the exception applies only to those pollutants specifically listed, and the list does not include ozone (or fine particles). *Id.*

The Mocksville SLAMS ozone monitor in Davie County similarly does not meet federal shutdown requirements. Readings at this monitor show an exceedance of the 8-hour ozone NAAQS in the past five years: in 2009, the design value was 78 ppb, several parts per billion higher than the current 75 ppb standard. In 2012, the Mocksville monitor’s 4th-highest reading was 76 ppb, which is also higher than the NAAQS. These measurements show that the area has exceeded the ozone NAAQS in the recent past and indicates that the ozone concentrations in the area could continue to fluctuate above the standard in the future. DAQ purports to justify removal of the Mocksville monitor on the basis that the ozone measurements at this site have correlated with those at the Clemmons School monitor in 2013. This explanation lacks regulatory support, for the same reasons described in the previous paragraph.

The Franklinton SLAMS ozone monitor in Franklin County also cannot be removed, since it likewise does not meet federal shutdown requirements. Applying EPA’s risk test to DAQ’s 2009–2013 data from the Franklinton monitor, the resulting risk value 75.3 ppb. Because the risk value must be less than 60 ppb in order to ensure a sufficiently low risk of future exceedances, this monitor cannot be removed. DAQ attempts to defend its decision to remove this monitor by stating that the concentrations measured correlated with the Millbrook monitor in 2013. This explanation lacks regulatory support, for the same reasons described in the preceding paragraphs.

In addition, none of the fine particle monitors that DAQ proposes to remove meet federal shutdown requirements. Applying EPA’s risk test formula to DAQ’s 2009–2013 design values for each of these monitors shows that none of them present a less than 10% chance of exceeding 80% of the fine particle annual NAAQS (or 9.6 ug/m³) in the next three years, and therefore monitoring at these sites must continue.⁹ Table 1 shows the results of EPA’s risk test for each of the fine particle monitors slated for removal.

Table 1: Comparison of Actual Risk Value to Risk Value Required for Removal (ug/m³)		
Monitoring Site	Actual Risk Value	Risk Value Required for Removal
Board of Education (Buncombe Co.)	10.12	< 9.6

⁹ Each of these monitors must also meet EPA’s risk test for the 24-hour fine particle NAAQS. However, because none of the monitors meet the shutdown requirements based on the annual NAAQS, it is not necessary to calculate the 24-hour values.

Colfax (Guilford Co.)	11.78	< 9.6
Dillard (Wayne Co.)	13.05	< 9.6
Grier (Gaston Co.)	12.50	< 9.6
Hopedale (Alamance Co.)	12.24	< 9.6
Linkhaw (Robeson Co.)	12.03	< 9.6
Pittsboro (Chatham Co.)	10.69	< 9.6

In sum, each of the fine particle and ozone monitors that DAQ wishes to remove are federally required to remain in place, due to past pollution problems and impermissibly high risks that these problems will continue into the future.

III. The Ozone Monitors Slated for Removal Show Nonattainment of the Pending Ozone Standard.

As mentioned above, EPA’s Clean Air Science Advisory Committee recently recommended strengthening the ozone standard to 60–70 ppb, and cautioned that even a revised limit as high as 70 ppb would provide “little margin of safety for the protection of public health, particularly for sensitive subpopulations.”¹⁰ All of the ozone monitors that DAQ plans to remove show exceedances of this new standard in the past five years. The following table depicts the design values of these monitors from the past five years (darker shading indicates a higher exceedance of the new standard).

	2009	2010	2011	2012	2013
Bushy Fork	74	72	70	74	69
Franklinton	74	71	69	72	68
Mocksville	78	74	71	73	70

As Table 2 shows, none of these monitors’ design values have been below the range recommended by the Science Advisory Committee in any of the past five years. It is therefore highly likely that these areas would exceed the ozone NAAQS once EPA updates the standard to conform to the Science Advisory Committee’s recommendation. Without the monitors currently in place, however, there will be no way to tell whether exceedances of the safety standard persist.

¹⁰ See Letter from Dr. H. Christopher Frey, Chair, Clean Air Scientific Advisory Committee, to Gina McCarthy, Administrator, U.S. EPA at ii (June 26, 2014), available at [http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/\\$File/EPA-CASAC-14-004+unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/$File/EPA-CASAC-14-004+unsigned.pdf).

In addition, the public will have no way of knowing whether DAQ has taken sufficient action to remedy these exceedances.

IV. The Ozone and Fine Particle Monitors Should Be Retained to Protect the Public in Areas with Historically Poor Air Quality, and with Major Pollution Sources Nearby.

In areas that have experience elevated levels of pollution for years, it is especially important that DAQ leave existing monitors in place. Guilford County, for example, was designated non-attainment for fine particle pollution until recently. Removal of the Colfax fine particle monitor in this county would substantially hinder regulators' and the public's ability to know if and when the area cycles back into non-attainment in the future, as well as their ability to take appropriate action in response. Maintaining monitors in areas with historically poor air quality is especially important to ensure that people who have been exposed to high levels of harmful pollutants for years will not continue to be exposed to the cumulative effects of ozone and fine particles going forward.

Recent improvements in air quality could be due to transient conditions, such as fluctuations in weather patterns. Ozone concentrations in particular are especially sensitive to weather conditions. Hot, dry, stagnant summers yield higher ozone levels than relatively cool, wet, windy ones, all other factors being equal. Decreases in ozone concentrations in recent years could be due in large part to these weather fluctuations. In fact, absent record evidence of significant, quantified, and permanent reductions in emissions of NO_x and VOCs in the area, weather fluctuations are the only explanation for improved ozone levels. DAQ cannot rely on the vagaries of weather patterns to satisfy state and federal public health protection standards.

In addition, many of the monitors slated for removal are located near existing and proposed major sources of pollution. The fine particle monitor at the Board of Education building in Asheville, which is slated for removal, is located near Duke Energy Progress's Asheville coal-fired power plant, a major emitter of fine particle pollution. The Bushy Fork ozone monitor that DAQ proposes to remove is located near Duke Energy Progress's Roxboro coal-fired power plant, one of the largest coal-fired power plants in the state and a major emitter of ozone precursors like nitrogen oxides and volatile organic compounds. The Grier School fine particle monitor in Gaston County is located in an area where major new transportation infrastructure projects are expected in the near future, which will increase fine particle emissions due to increased construction and transportation-related emissions.

With the loss of the monitors currently operating at these locations, the public will not know if pollution concentrations from these sources increase in the future due to changes in operations or defective pollution controls. It is therefore essential that these monitors remain in place.

V. Sulfur Dioxide Monitors Should Not Displace Ozone and Fine Particle Monitors.

One of DAQ's explanations for shuttering ozone and fine particle monitors is to shift resources to sulfur dioxide monitors. This rationale is mistaken, since sulfur dioxide modeling is

less expensive, generally better at detecting exceedances, and already exists for many key areas in North Carolina. The vast majority of sulfur dioxide emissions come from a small number of sources, primarily coal-fired power plants, which facilitates modeling for this pollutant. In fact, in the Final SO₂ NAAQS Rule, EPA explained that air dispersion modeling is the best method for evaluating the short-term impacts of large sulfur dioxide sources. This is consistent with EPA's historic use of air dispersion modeling for sulfur dioxide NAAQS attainment designations and SIP revisions. *See* 75 Fed. Reg. at 35,551. Instead of spending unnecessary resources on sulfur dioxide monitors, DAQ should maintain existing monitors necessary to evaluate fine particle and ozone concentrations.

In the alternative, if DAQ decides to use the more resource-intensive monitoring approach in addition to existing modeling to characterize sulfur dioxide concentrations, it must add more sulfur dioxide monitors in appropriate locations to determine if there are any exceedances of the standard beyond the fence line of major sources of sulfur dioxide. The sulfur dioxide monitors that DAQ proposes to add would not be situated properly in relation to major sources of sulfur dioxide, and therefore would not detect all exceedances of the standard. For example, the Bushy Fork sulfur dioxide monitor would be located more than 12 miles away from Duke Energy Progress's coal-fired Roxboro power plant—one of the largest sources of sulfur dioxide in North Carolina—and outside of the areas that are expected to experience the highest exceedances of the sulfur dioxide NAAQS as a result of emissions from this facility.¹¹

In addition, even if DAQ does decide to add significantly more sulfur dioxide monitors to its monitoring fleet, it should keep the existing ozone and fine particle monitors in place (and is required to do so, as described in Section II). Major sources of sulfur dioxide are generally also major sources of fine particles, volatile organic compounds, and nitrogen oxides, which contribute to ozone and particulate matter formation. Therefore in areas where sulfur dioxide measurements are important, ozone and fine particle measurements are necessary as well. Sulfur dioxide monitors will not ensure that the public is protected against the health threats of fine particles and ozone.

Conclusion

For all of the reasons described above, DAQ should revise the 2014-2015 monitoring plan to maintain and expand the fine particle and ozone monitors in the state, rather than depleting the existing network. The Conservation Groups do not support removing any of the monitors that would be removed under DAQ's plan. We appreciate the opportunity to submit these comments.

¹¹ *See* Attach. A, Steven Klafka, *Roxboro Steam Electric Plant, Evaluation of Compliance with 1-hour SO₂ NAAQS* at 11–12 (Dec. 5, 2012) (the “Klafka Report”).

Donnie Redmond
September 26, 2014
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Sincerely,

A handwritten signature in black ink, appearing to read "Myra Blake". The signature is written in a cursive style with a large, prominent "B".

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Roxboro Steam Electric Plant
Semora, North Carolina
Sierra Club Evaluation of Compliance with 1-hour SO₂ NAAQS
December 5, 2012

Conducted by:
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1. Introduction

The Sierra Club prepared an air modeling impact analysis to help USEPA, state and local air agencies identify facilities that are likely causing violations of the 1-hour sulfur dioxide (SO₂) national ambient air quality standard (NAAQS). This document describes the results and procedures for an evaluation conducted for the Roxboro Steam Electric Plant located in Semora, North Carolina.

The dispersion modeling analysis predicted ambient air concentrations for comparison with the one hour SO₂ NAAQS. The modeling was performed using the most recent version of AERMOD, AERMET, and AERMINUTE, with data provided to the Sierra Club by regulatory air agencies and through other publicly-available sources as documented below. The analysis was conducted in adherence to all available USEPA guidance for evaluating source impacts on attainment of the 1-hour SO₂ NAAQS via aerial dispersion modeling, including the AERMOD Implementation Guide; USEPA's Applicability of Appendix W Modeling Guidance for the 1-hour SO₂ National Ambient Air Quality Standard, August 23, 2010; modeling guidance promulgated by USEPA in Appendix W to 40 CFR Part 51; and, USEPA's March 2011 Modeling Guidance for SO₂ NAAQS Designations, available at <http://www.epa.gov/ttn/scram/SO2%20Designations%20Guidance%202011.pdf>.

2. Compliance with the 1-hour SO₂ NAAQS

2.1 1-hour SO₂ NAAQS

The 1-hour SO₂ NAAQS takes the form of a three-year average of the 99th-percentile of the annual distribution of daily maximum 1-hour concentrations, which cannot exceed 75 ppb.¹ Compliance with this standard was verified using USEPA's AERMOD air dispersion model, which produces air concentrations in units of µg/m³. The 1-hour SO₂ NAAQS of 75 ppb equals 196.2 µg/m³, and this is the value used for determining whether modeled impacts exceed the NAAQS.² The 99th-percentile of the annual distribution of daily maximum 1-hour concentrations corresponds to the fourth-highest value at each receptor for a given year.

2.2 Modeling Results

Modeling results for Roxboro Steam Electric Plant are summarized in Table 1. It was determined that based on either currently permitted emissions or measured actual emissions, the Roxboro Steam Electric Plant is estimated to create downwind SO₂ concentrations which exceed the 1-hour NAAQS.

¹ USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO₂ National Ambient Air Quality Standard, August 23, 2010.

² The ppb to µg/m³ conversion is found in the source code to AERMOD v. 11103, subroutine Modules. The conversion calculation is $75/0.3823 = 196.2$ µg/m³.

The currently permitted emissions and measured actual emissions used for the modeling analysis are summarized in Table 2. Based on the modeling results, emission reductions from current rates considered necessary to achieve compliance with the 1-hour NAAQS were calculated and presented in Table 3.

Predicted exceedences of the 1-hour NAAQS for SO₂ extend throughout the region to a maximum distance of 50 kilometers.

Figure 1 provided at the end of this report shows the extent of NAAQS violations throughout the entire 50 kilometer modeling domain.

Figure 2 provides a close-up local view of NAAQS violations.

Air quality impacts in North Carolina are based on a background concentration of 18.3 µg/m³. This is the 2009-11 design value for Martin County, North Carolina - the lowest measured background concentration in the state. This is the most recently available design value.

2.3 Conservative Modeling Assumptions

A dispersion modeling analysis requires the selection of numerous parameters which affect the predicted concentrations. For the enclosed analysis, several parameters were selected which under-predict facility impacts.

Assumptions used in this modeling analysis which likely under-estimate concentrations include the following:

- Allowable emissions are based on a limitation with an averaging period which is greater than the 1-hour average used for the SO₂ air quality standard. Emissions and impacts during any 1-hour period may be higher than assumed for the modeling analysis.
- No consideration of facility operation at less than 100% load. Stack parameters such as exit flow rate and temperature are typically lower at less than full load, reducing pollutant dispersion and increasing predicted air quality impacts.
- No consideration of building or structure downwash. These downwash effects typically increase predicted concentrations near the facility.
- No consideration of off-site sources. These other sources of SO₂ will increase the predicted impacts.

Table 1 - SO₂ Modeling Results for Roxboro Steam Electric Plant Modeling Analysis

Emission Rates	Averaging Period	99 th Percentile 1-hour Daily Maximum (µg/m ³)				Complies with NAAQS?
		Impact	Background	Total	NAAQS	
Allowable ³	1-hour	721.8	18.3	740.1	196.2	No
Maximum ⁴	1-hour	340.6	18.3	358.9	196.2	No

Table 2 - Modeled SO₂ Emissions from Roxboro Steam Electric Plant^{3,4}

Stack ID	Unit ID	Allowable Emissions Monthly Average (lbs/hr)	Maximum Emissions 1-hour Average (lbs/hr)
S01	Unit 1	2,582.9	1,244
S02	Unit 2	3,848.1	2,071
S03	Unit 3A	2,330.8	825
	Unit 3B	2,330.8	825
S04	Unit 4A	2,242.2	2,370
	Unit 4B	2,242.2	2,370
Stack Total	All Units	15,576.8	7,335

Table 3 - Required Emission Reductions for Compliance with 1-hour SO₂ NAAQS

Acceptable Impact (NAAQS - Background) 99 th Percentile 1-hour Daily Max (µg/m ³)	Required Total Facility Reduction Based on Allowable Emissions (%)	Required Total Facility Emission Rate (lbs/hr)	Required Total Facility 1-hour Average Emission Rate (lbs/mmbtu)
177.9	75.4%	3,839.2	0.13

³ North Carolina, Department of Environment and Natural Resources, Air Quality Permit No. 01001T47, September 3, 2010. Allowable SO₂ emissions are based on a limitation of 0.547 lbs per mmbtu for each of the six boilers at the plant.

⁴ Maximum emissions are measured hourly rates reported for 2011 in USEPA, Clean Air Markets - Data and Maps.

3. Modeling Methodology

3.1 Air Dispersion Model

The modeling analysis used USEPA's AERMOD program, version 12060. AERMOD, as available from the Support Center for Regulatory Atmospheric Modeling (SCRAM) website, was used in conjunction with a third-party modeling software program, *AERMOD View*, sold by Lakes Environmental Software.

3.2 Control Options

The AERMOD model was run with the following control options:

- 1-hour average air concentrations
- Regulatory defaults
- Flagpole receptors

To reflect a representative inhalation level, a flagpole height of 1.5 meters was used for all modeled receptors. This parameter was added to the receptor file when running AERMAP, as described in Section 4.4.

An evaluation was conducted to determine if the modeled facility was located in a rural or urban setting using USEPA's methodology outlined in Section 7.2.3 of the Guideline on Air Quality Models.⁵ For urban sources, the URBANOPT option is used in conjunction with the urban population from an appropriate nearby city and a default surface roughness of 1.0 meter. Methods described in Section 4.1 to determine whether rural or urban dispersion coefficients were used.

3.3 Output Options

The AERMOD analysis was based on five years of recent meteorological data. The modeling analyses used one run with five years of sequential meteorological data from 2007-2011. Consistent with USEPA's Modeling Guidance for SO₂ NAAQS Designations, AERMOD provided a table of fourth-high 1-hour SO₂ impacts concentrations consistent with the form of the 1-hour SO₂ NAAQS.⁶

Please refer to Table 1 for the modeling results.

⁵ USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005.

⁶ USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 24-26.

4. Model Inputs

4.1 Geographical Inputs

The “ground floor” of all air dispersion modeling analyses is establishing a coordinate system for identifying the geographical location of emission sources and receptors. These geographical locations are used to determine local characteristics (such as land use and elevation), and also to ascertain source to receptor distances and relationships.

The Universal Transverse Mercator (UTM) NAD83 coordinate system was used for identifying the easting (x) and northing (y) coordinates of the modeled sources and receptors. Stack locations were obtained from facility permits and prior modeling files provided by the state regulatory agency. The stack locations were then verified using aerial photographs.

The facility was evaluated to determine if it should be modeled using the rural or urban dispersion coefficient option in AERMOD. A GIS was used to determine whether rural or urban dispersion coefficients apply to a site. Land use within a three-kilometer radius circle surrounding the facility was considered. USEPA guidance states that urban dispersion coefficients are used if more than 50% of the area within 3 kilometers has urban land uses. Otherwise, rural dispersion coefficients are appropriate.⁷

USEPA’s AERSURFACE model Version 08009 was used to develop the meteorological data for the modeling analysis. This model was also used to evaluate surrounding land use within 3 kilometers. Based on the output from the AERSURFACE, approximately 11.3% of surrounding land use around the airport was of urban land use types including: 21 – Low Intensity Residential, 22 – High Intensity Residential, and 23 - Commercial/Industrial/Transportation.

This is less than the 50% value considered appropriate for the use of urban dispersion coefficients. Based on the AERSURFACE analysis, it was concluded that the rural option would be used for the modeling summarized in this report. Please refer to Section 4.5.3 for a discussion of the AERSURFACE analysis.

⁷ USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005, Section 7.2.3.

4.2 Emission Rates and Source Parameters

The modeling analyses only considered SO₂ emissions from the facility. Off-site sources were not considered. Concentrations were predicted for two scenarios shown in Table 2:

- 1) approved or allowable emissions based on permits issued by the regulatory agency, and
- 2) measured actual hourly SO₂ emissions obtained from USEPA's Clean Air Markets Database. To assure realistic emission rates were used, emissions from all units at the facility were combined and the hour with the maximum total facility emissions was used to determine the actual emissions.

Stack parameters and emissions used for the modeling analysis are summarized in Table 4.

*Table 4 – Facility Stack Parameters and Emissions*⁸

Stack	S01	S02	S03	S04
Description	Unit 1	Unit 2	Units 3A & 3B	Units 4A & 4B
X Coord. [m]	672765.49	672758.49	672611.45	672603.45
Y Coord. [m]	4039371.46	4039371.46	4039382.44	4039382.44
Base Elevation [m]	132.48	132.39	132.05	132.12
Release Height [m]	121.92	121.92	121.92	121.92
Gas Exit Temperature [°K]	325.37	325.93	326.48	325.91
Gas Exit Velocity [m/s]	14.22	15.32	14.32	14.32
Inside Diameter [m]	6.71	8.69	9.3	9.3
Allowable Emission Rate [g/s]	325.4	484.9	587.3	565
Maximum Emission Rate [g/s]	156.7	260.9	207.9	298.6

The above stack parameters and emissions were obtained from regulatory agency documents and databases identified in Section 2.3. The analysis was conducted based on 100% operating load using maximum exhaust flow rates and emission rates. Operation at less than full capacity loads was not considered. This assumption tends to under-predict impacts since stack parameters such as exit flow rate and temperature are typically lower at less than full load, reducing pollutant dispersion and increasing predicted air quality impacts. Stack location, height and diameter were verified using aerial photographs, and flue gas flow rate and temperature were verified using combustion calculations.

⁸ NCDENR, Hazardous air pollutant AERMOD modeling files for Roxboro Steam Electric Plant, November 21, 2008.

4.3 Building Dimensions and GEP

No building dimensions or prior downwash evaluations were available. Therefore this modeling analysis did not address the effects of downwash which may increase predicted concentrations.

4.4 Receptors

For Roxboro Steam Electric Plant, three receptor grids were employed:

1. A 100-meter Cartesian receptor grid centered on Roxboro Steam Electric Plant and extending out 5 kilometers.
2. A 500-meter Cartesian receptor grid centered on Roxboro Steam Electric Plant and extending out 10 kilometers.
3. A 1,000-meter Cartesian receptor grid centered on Roxboro Steam Electric Plant and extending out 50 kilometers. 50 kilometers is the maximum distance accepted by USEPA for the use of the AERMOD dispersion model.⁹

A flagpole height of 1.5 meters was used for all these receptors.

Elevations from stacks and receptors were obtained from National Elevation Dataset (NED) GeoTiff data. GeoTiff is a binary file that includes data descriptors and geo-referencing information necessary for extracting terrain elevations. These elevations were extracted from 1 arc-second (30 meter) resolution NED files. The USEPA software program AERMAP v. 11103 is used for these tasks.

4.5 Meteorological Data

To improve the accuracy of the modeling analysis, recent meteorological data for the 2007 to 2011 period were prepared using the USEPA's program AERMET which creates the model-ready surface and profile data files required by AERMOD. Required data inputs to AERMET included surface meteorological measurements, twice-daily soundings of upper air measurements, and the micrometeorological parameters surface roughness, albedo, and Bowen ratio. One-minute ASOS data were available so USEPA methods were used to reduce calm and missing hours.¹⁰ The USEPA software program AERMINUTE v. 11325 is used for these tasks.

⁹ USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, Section A.1.(1), November 9, 2005.

¹⁰ USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, p. 19.

This section discusses how the meteorological data was prepared for use in the 1-hour SO₂ NAAQS modeling analyses. The USEPA software program AERMET v. 11059 is used for these tasks.

4.5.1 Surface Meteorology

Surface meteorology was obtained for Raleigh - Durham International Airport, North Carolina located near the Roxboro Steam Electric Plant. Integrated Surface Hourly (ISH) data for the 2007 to 2011 period were obtained from the National Climatic Data Center (NCDC). The ISH surface data was processed through AERMET Stage 1, which performs data extraction and quality control checks.

4.5.2 Upper Air Data

Upper-air data are collected by a “weather balloon” that is released twice per day at selected locations. As the balloon is released, it rises through the atmosphere, and radios the data back to the surface. The measuring and transmitting device is known as either a radiosonde, or rawindsonde. Data collected and radioed back include: air pressure, height, temperature, dew point, wind speed, and wind direction. The upper air data were processed through AERMET Stage 1, which performs data extraction and quality control checks.

For Roxboro Steam Electric Plant, the concurrent 2007 through 2011 upper air data from twice-daily radiosonde measurements obtained at the most representative location were used. This location was the Greenboro, North Carolina measurement station. These data are in Forecast Systems Laboratory (FSL) format and were downloaded in ASCII text format from NOAA’s FSL website.¹¹ All reporting levels were downloaded and processed with AERMET.

4.5.3 AERSURFACE

AERSURFACE is a non-guideline program that extracts surface roughness, albedo, and daytime Bowen ratio for an area surrounding a given location. AERSURFACE uses land use and land cover (LULC) data in the U.S. Geological Survey’s 1992 National Land Cover Dataset to extract the necessary micrometeorological data. LULC data was used for processing meteorological data sets used as input to AERMOD.

AERSURFACE v. 08009 was used to develop surface roughness, albedo, and daytime Bowen ratio values in a region surrounding the meteorological data collection site. AERSURFACE was used to develop surface roughness in a one kilometer radius surrounding the data collection site. Bowen ratio and albedo was developed for a 10 kilometer by 10 kilometer area centered on the

¹¹ Available at: <http://esrl.noaa.gov/raobs/>

meteorological data collection site. These micrometeorological data were processed for seasonal periods using 30-degree sectors. Seasonal moisture conditions were considered average with no months with continuous snow cover.

4.5.4 Data Review

Missing meteorological data were not filled as the data file met USEPA's 90% data completeness requirement.¹² The AERMOD output file shows there were 2.0% missing data.

The representativeness of airport meteorological data is a potential concern in modeling industrial source sites.¹³ The surface characteristics of the airport data collection site and the modeled source location were compared. Since the Raleigh - Durham International Airport, North Carolina is located close to Roxboro Steam Electric Plant, this meteorological data set was considered appropriate for this modeling analysis.

5. Background SO₂ Concentrations

Background concentrations were determined consistent with USEPA's Modeling Guidance for SO₂ NAAQS Designations.¹⁴ To preserve the form of the 1-hour SO₂ standard, based on the 99th percentile of the annual distribution of daily maximum 1-hour concentrations averaged across the number of years modeled, the background fourth-highest daily maximum 1-hour SO₂ concentration was added to the modeled fourth-highest daily maximum 1-hour SO₂ concentration.¹⁵

Background concentrations were based on the 2009-11 design value measured by the ambient monitors located in North Carolina.¹⁶

6. Reporting

All files from the programs used for this modeling analysis are available to regulatory agencies. These include analyses prepared with AERSURFACE, AERMET, AERMAP, and AERMOD.

¹² USEPA, Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-05, February 2000, Section 5.3.2, pp. 5-4 to 5-5.

¹³ USEPA, AERMOD Implementation Guide, March 19, 2009, pp. 3-4.

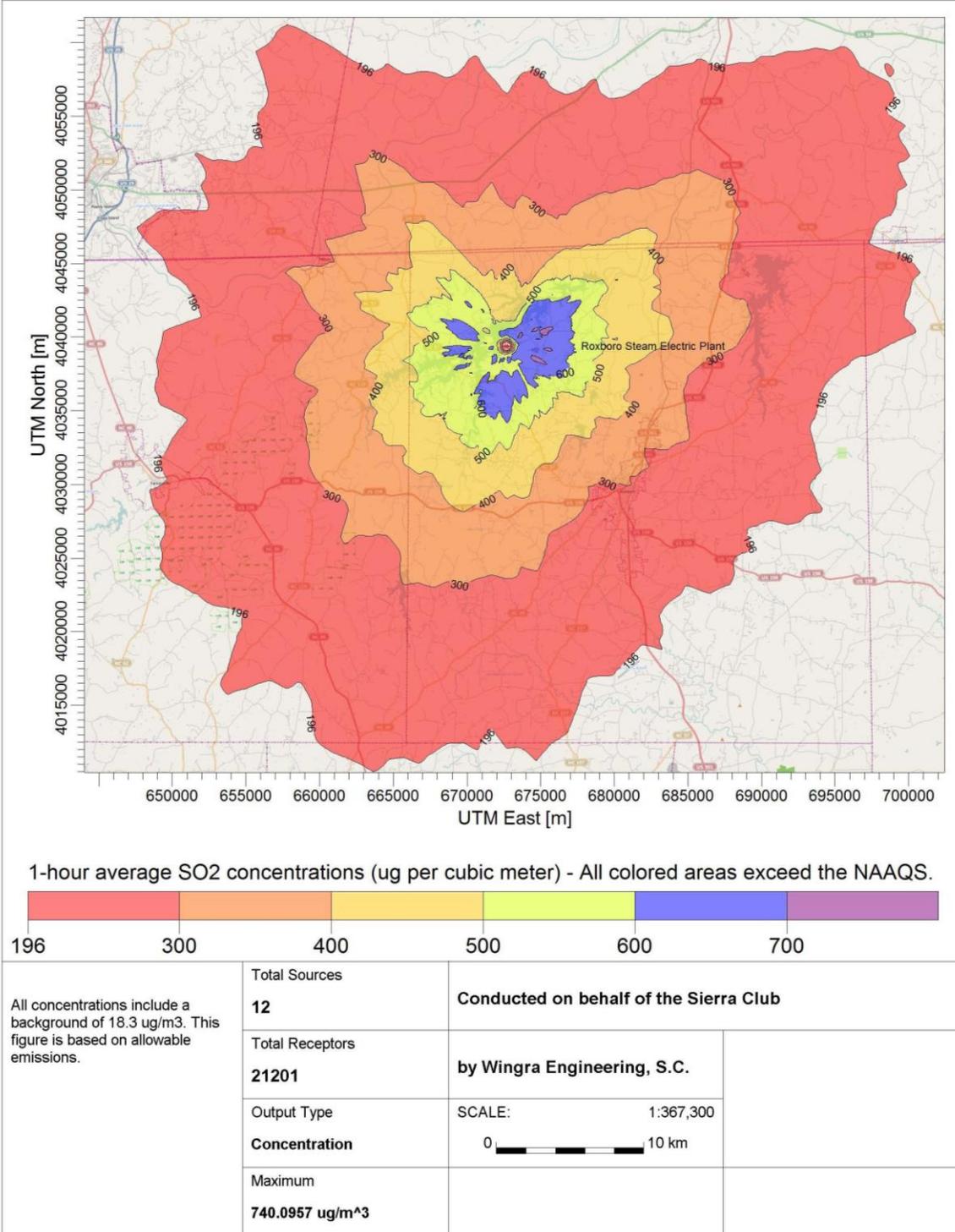
¹⁴ USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 20-23.

¹⁵ USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO₂ National Ambient Air Quality Standard, August 23, 2010, p. 3.

¹⁶ <http://www.epa.gov/airtrends/values.html>

Roxboro Steam Electric Plant - Semora, North Carolina
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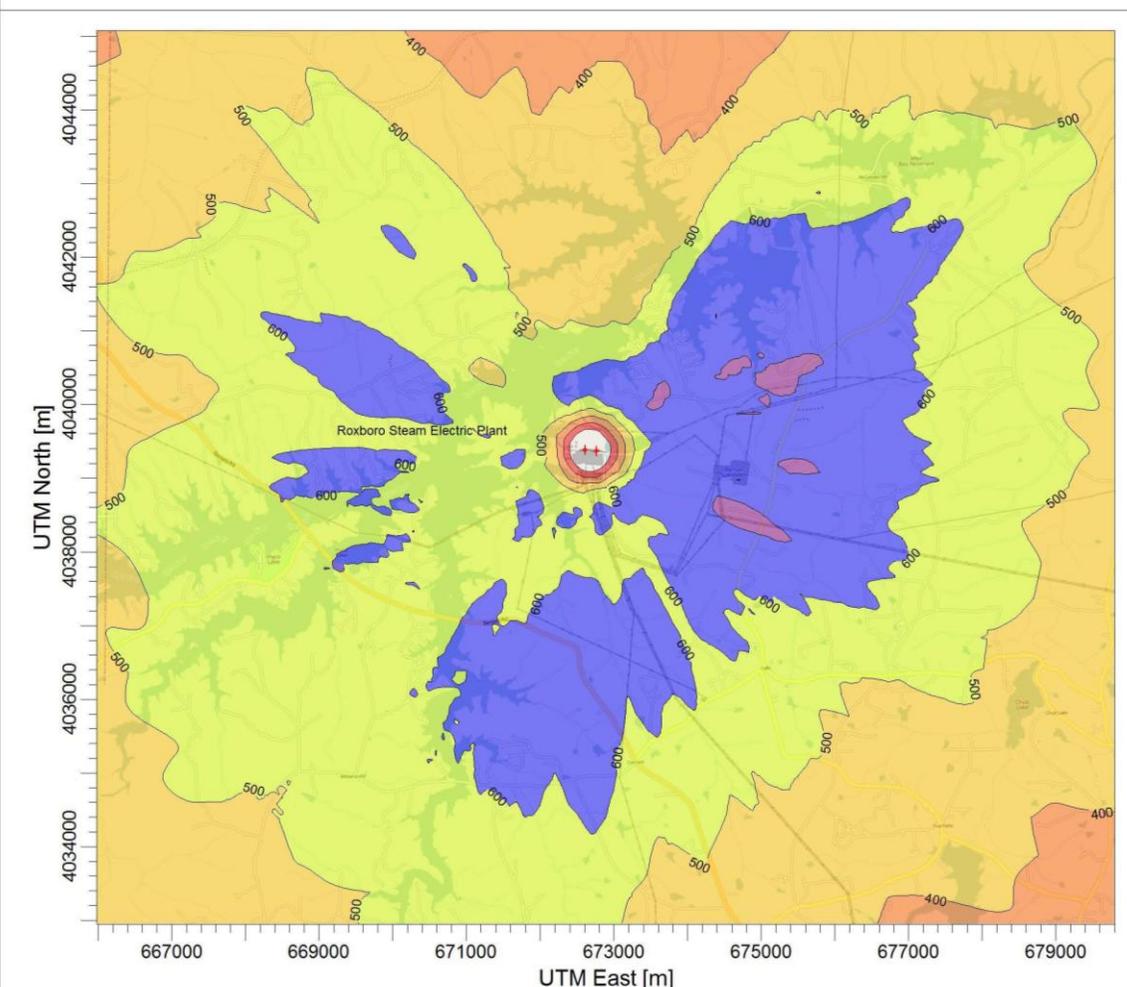
Figure 1



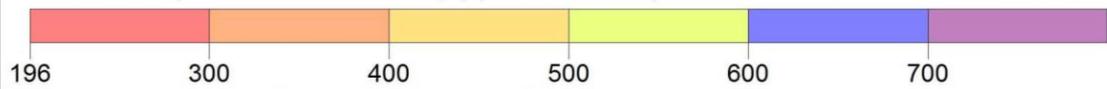
AERMOD View - Lakes Environmental Software

Roxboro Steam Electric Plant - Semora, North Carolina
Evaluation of Compliance with the 1-hour NAAQS for SO2

Figure 2



1-hour average SO2 concentrations (ug per cubic meter) - All colored areas exceed the NAAQS.



All concentrations include a background of 18.3 ug/m ³ . This figure is based on allowable emissions.	Total Sources 12	Conducted on behalf of the Sierra Club by Wingra Engineering, S.C.	
	Total Receptors 21201		
	Output Type Concentration	SCALE: 1:86,889 0 3 km	
	Maximum 740.0957 ug/m³		

AERMOD View - Lakes Environmental Software

Glossary

AQS - Air Quality System
AQI - Air Quality Index
ARM - Approved Regional Method
BAM - Beta Attenuation Method
CSS - Continuous Speciation Site
CO - Carbon Monoxide
CFR - Code of Federal Regulations
ECB – Electronics and Calibration Branch
EPA - Environmental Protection Agency
FEM – Federal Equivalent Method
FRM - Federal Reference Method
IMPROVE - Interagency Monitoring of Protected Visual Environments
MSA - Metropolitan Statistical Area
NAAQS - National Ambient Air Quality Standards
NC-DAQ - North Carolina Division of Air Quality
NCore - National Core (Ambient Monitoring Network Station)
NO₂ - Nitrogen Dioxide
NO_y - Oxides of Nitrogen
O₃ - Ozone
Pb - Lead
PM - Particulate Matter
PM 2.5 - Fine Particulate (particles of 2.5 microns aerodynamic diameter and below)
PM 10 - Particles of 10 microns aerodynamic diameter and below
PSD - Prevention of Significant Deterioration
SLAMs - State and Local Air Monitoring Station
SIP – State Implementation Plan
SO₂ - Sulfur Dioxide
SPM - Special Purpose Monitor
TECO - Thermo Environmental, Incorporated
TEOM - Tapered Element Oscillating Microbalance
TLE - Trace Level (monitor)
TSP – Total Suspended Particulate
URG – University Research Glass
VDEQ - Virginia Department of Environmental Quality
WINS - Well Impactor Ninety Six (PM 2.5 separator)
ZAG – Zero Air Generator
ZAS – Zero Air Supply