

AIR QUALITY MONITORING GROUP

2010 Annual Monitoring Network Plan Mecklenburg County Air Quality

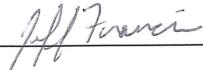


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July 1, 2010

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CERTIFICATION

By the signatures below, Mecklenburg County Air Quality (MCAQ) certifies that the information contained in the "2010 Annual Monitoring Network Plan for Mecklenburg County Air Quality" 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.

Print Name: Jeff Francis Signature:  Date: June 29, 2010

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**2010 ANNUAL MONITORING NETWORK PLAN
MECKLENBURG COUNTY AIR QUALITY**

Table of Contents

I. INTRODUCTION	7
National Ambient Air Quality Standards.....	8
II. SITE DESCRIPTION BACKGROUND INFORMATION AND DEFINITIONS.....	10
1. Site Description.....	10
2. Date Established.....	10
3. Site Approval Status	10
4. Monitoring Objectives	10
5. Monitoring Stations’ Designations	11
(A) SLAMS.....	11
(B) SPM	11
(C) NCore.....	11
6. Monitoring Methods	11
(A) Particulate Matter 10 microns in size (PM ₁₀).....	12
(B) Particulate Matter (PM _{2.5} , PM ₁₀ lo-vol, PM _C)	12
(C) PM _{2.5} Speciation sampling and analysis	12
(D) Sulfur Dioxide	12
(E) Carbon Monoxide	12
(F) Ozone	13
(G) Nitrogen Dioxide.....	13
(H) Reactive Oxides of Nitrogen	13
(I) Lead (Pb).....	13
7. Quality Assurance Status	13
8. Scale of Representativeness	14
9. Data Processing and Reporting	15
III. NETWORK SUMMARY	16
1. Site Table and Criteria Pollutants Monitored	16
2. Site Map.....	17
3. Monitoring Methods	18
4. Network Modifications	20
(A) Monitoring Station Siting Modifications	20
(B) Instrumentation Operation Modifications	21
IV. AIR MONITORING STATION DESCRIPTIONS	23
1. #11 Fire Station.....	23
(A) #11 Fire Station Site Table.....	23
(B) #11 Fire Station Site Description and Statement of Purpose.....	23
(C) #11 Fire Station Aerial Photograph	25
(D) #11 Fire Station Site Photographs	26
WEST NORTHWEST2. Arrowood.....	26
2. Arrowood	27
(A) Arrowood Site Table	27
(B) Arrowood Site Description and Statement of Purpose.....	27
(C) Arrowood Aerial Photograph	29
(D) Arrowood Site Photographs	30
3. County Line	31
(A) County Line Site Table.....	31
(B) County Line Site Description and Statement of Purpose	31

(C) County Line Aerial Photograph.....	33
(D) County Line Site Photographs.....	34
4. Davidson	35
(A) Davidson Site Table	35
(B) Davidson Site Description and Statement of Purpose:.....	35
(C) Davidson Aerial Photograph	37
(D) Davidson Site Photographs	38
5. Garinger	39
(A) Garinger Site Table	39
(B) Garinger Site Description and Statement of Purpose	40
(C) Garinger Aerial Photograph.....	44
(D) Garinger Site Photographs.....	45
6. Montclair	46
(A) Montclair Site Table	46
(B) Montclair Site Description and Statement of Purpose.....	47
(C) Montclair Aerial Photograph	48
(D) Montclair Site Photographs	49
7. Oakdale	50
(A) Oakdale Site Table	50
(B) Oakdale Site Description and Statement of Purpose	50
(C) Oakdale Aerial Photograph	51
(D) Oakdale Site Photographs	52
V. REFERENCES.....	53
Appendix A.....	54
MCAQ AMBIENT AIR MONITORING WORK PLAN FOR N CORE MONITORING STATION (Revised to reflect current status 2010)	54
(A) NCore Plan Overview	54
(B) NCore Monitoring Objectives	54
(C) NCore Methodology	54
(D) NCore Siting Requirements and Criteria.....	55
(E) NCore Measurement Status (37-119-0041) and Waiver Requests.....	59
(F) Other NCore Considerations.....	62
Appendix B. - N CORE Approval Letter:	63

I. INTRODUCTION

The Mecklenburg County Air Quality (MCAQ) monitoring program, a division of the Mecklenburg County Land Use and Environmental Services Agency (LUESA); provides air quality monitoring services in Mecklenburg County, NC. Mecklenburg County Air Quality is a state “certified local air pollution program” whose purpose is to improve and maintain ambient air quality and reduce exposure to unhealthful air pollutants.

MCAQ has operated an air quality monitoring program since the mid 1960’s. The air monitoring services provided by the program are conducted to measure concentrations of criteria air pollutants (CO, NO₂, SO₂, PM, lead, and O₃) in accordance with USEPA regulatory requirements. Measurements are used to assess compliance with National Ambient Air Quality Standards (NAAQS). The NAAQS define air pollutant concentration level thresholds judged necessary to protect the public health and welfare (Table 1).

National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾		
Lead	0.15 µg/m ³ ⁽²⁾	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m ³	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb ⁽³⁾	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour ⁽⁴⁾	None	
Particulate Matter (PM₁₀)	150 µg/m ³	24-hour ⁽⁵⁾	Same as Primary	
Particulate Matter (PM_{2.5})	15.0 µg/m ³	Annual ⁽⁶⁾ (Arithmetic Average)	Same as Primary	
	35 µg/m ³	24-hour ⁽⁷⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁸⁾	Same as Primary	
	0.08 ppm (1997 std)	8-hour ⁽⁹⁾	Same as Primary	
	0.12 ppm	1-hour ⁽¹⁰⁾	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour ⁽¹⁾
	0.14 ppm	24-hour ⁽¹⁾		

Table 1.

(1) Not to be exceeded more than once per year.

(2) Final rule signed October 15, 2008.

(3) The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard

(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

(5) Not to be exceeded more than once per year on average over 3 years.

(6) To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

(7) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

(9) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(c) EPA is in the process of reconsidering these standards (set in March 2008).

(10) (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

The MCAQ air monitoring program operates a network of state and local air monitoring stations (SLAMS) in Mecklenburg County. The current network configuration consists of seven monitoring stations that measure concentrations of criteria air pollutants. In addition to the SLAMS network the county network also includes monitoring for meteorological parameters, National Core (NCore) multi-pollutant monitoring, and other special purpose monitoring.

The annual monitoring network plan, as provided for in 40 CFR Part 58.10, *Annual Monitoring Network Plan and Periodic Network Assessment* must contain the following information for each monitoring station in the network:

1. The Air Quality System (AQS) site identification number for existing stations.
2. The location, including the street address and geographical coordinates, for each monitoring station.
3. The sampling and analysis method used for each measured parameter.
4. The operating schedule for each monitor.
5. Any proposal to remove or move a monitoring station within a period of eighteen months following the plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS.
8. The Metropolitan Statistical Area (MSA), Core-Based Statistical Area (CBSA), combined Statistical Area (CSA) or other area represented by the monitor.

This report constitutes the Mecklenburg County Air Quality “annual monitoring network plan” and continues in the following sections outlined below:

II. Site Description Background Information and Definitions: An outline of the designations, parameters, monitoring methods, and the basis for site selection.

III. Network Summary: This section presents an overview of the total number of sites and monitors in Mecklenburg County. Also included is a listing of all proposed changes to the current network.

IV. Air Monitoring Station Description: Each air monitoring station is described in detail as per the outline required in section II above. Modification to the network as determined by the annual review process will be made each year to maintain a current up-to-date network description document.

II. SITE DESCRIPTION BACKGROUND INFORMATION AND DEFINITIONS

1. Site Description

Specific information is provided to show the location of the monitoring equipment at the site, if the site is located in a CSA/MSA, the AQS identification number, the GPS coordinates, and evidence that monitors and monitor probes conform to the siting criteria.

2. Date Established

The date when each existing monitoring station was established is shown in the description. For those stations, which are proposed, a date is provided when it is expected for the station to be in operation.

3. Site Approval Status

Each monitoring station in the existing network has been reviewed with the purpose of determining whether it meets all design criteria for inclusion in the SLAMS network. Stations that do not meet the criteria will either be relocated in a nearby area or when possible, re-sited at the present location.

4. Monitoring Objectives

Per 40 CFR 58 Appendix D, Section 1.1: “The ambient air monitoring networks must be designed to meet three basic monitoring objectives. These basic objectives are listed below. The appearance of any one objective in the order of this list is not based upon a prioritized scheme. Each objective is important and must be considered individually.” The objectives are listed below:

(a) Provide air pollution data to the general public in a timely manner. Data can be presented to the public in a number of attractive ways including through air quality maps, newspapers, Internet sites, and as part of weather forecasts and public advisories.

(b) Support compliance with ambient air quality standards and emissions strategy development. Data from FRM (Federal Reference Method), FEM (Federal Equivalent Method), and ARM (Approved Regional Method) monitors for NAAQS pollutants will be used for comparing an area’s air pollution levels against the NAAQS. Data from monitors of various types can be used in the development of attainment and maintenance plans. SLAMS, and especially NCore station data, will be used to evaluate the regional air quality models used in developing emission strategies, and to track trends in air pollution abatement control measures' impact on improving air quality. In monitoring locations near major air pollution sources, source-oriented monitoring data can provide insight into how well industrial sources are controlling their pollutant emissions.

(c) Support for air pollution research studies. Air pollution data from the NCore network can be used to supplement data collected by researchers working on health effects assessments and atmospheric processes, or for monitoring methods development work.

5. Monitoring Stations' Designations

Most stations described in the air quality surveillance network are designated as State and Local Air Monitoring Stations (SLAMS). In addition, some of these stations fulfill other requirements, which must be identified. In the description of the network, designations may also be made for Special Purpose Monitors (SPM) and National Core (NCore) multi-pollutant monitoring stations. The following is the criteria used for each of these designations.

(A) SLAMS: Requirements for air quality surveillance systems provide for the establishment of a network of monitoring stations designated as State and Local Air Monitoring Stations (SLAMS) that measure ambient air concentrations of those pollutants for which standards have been established. These stations must meet requirements that relate to four major areas: quality assurance, monitoring methodology, sampling interval and siting of instruments and instrument probes.

(B) SPM: Not all monitors and monitoring stations in the air quality surveillance network are included in the SLAMS network. In order to allow the capability of providing monitoring for various reasons such as: special studies, modeling verification and compliance status, and other objectives; certain monitors are designated as Special Purpose Monitors (SPM). These monitors are not committed to any one location or for any specified time period. They may be located as separate monitoring stations or be included at SLAMS locations. Monitoring data may be reported, provided that the monitors and stations conform to all requirements of the SLAMS network. Specific regulations regarding SPM's is contained in 40 CFR 58 §58.20.

(C) NCore (National Core multi-pollutant monitoring stations): "The NCore multi-pollutant stations are intended to track long-term trends for accountability of emissions control programs and health assessments that contribute to ongoing reviews of the NAAQS; support development of emissions control strategies through air quality model evaluation and other observational methods; support scientific studies ranging across technological, health, and atmospheric process disciplines; and support ecosystem assessments. These stations together with the more numerous PM_{2.5}, PM₁₀, O₃, and other NAAQS pollutant sites also provide data for use in attainment and nonattainment designations and for public reporting and forecasting of the AQI."⁶ Mecklenburg County's "Ambient Air Monitoring Work Plan For National Core (NCore) Monitoring Station" is contained in Appendix A.

6. Monitoring Methods

Sampling and analytical procedures for criteria air pollutant monitoring performed in the MCAQ ambient air monitoring network are conducted in accordance with applicable USEPA Designated Federal Reference (FRM) or Equivalent Methods (FEM) unless otherwise noted. Analytical techniques for non-criteria air pollutant monitoring (methods employed that are not USEPA Designated Federal Reference (FRM) or Equivalent Methods (FEM)) are documented in the applicable MCAQ Quality Assurance Project Plan (QAPP), MCAQ Standard Operating Procedure (SOP), or the appropriate North Carolina Division of Air Quality (NCDAQ) QAPP or SOP. Methods used by MCAQ for criteria pollutant monitoring and selected non-criteria monitoring are listed below:

(A) Particulate Matter 10 microns in size (PM₁₀)

All PM₁₀ samplers operated by MCAQ are operated as federal reference method (FRM) or equivalent samplers and are operated according to the requirements set forth in 40 CFR 50 and 40 CFR 53. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

<u>Method</u>	<u>Designation Number</u>	<u>Method Code</u>
Sierra-Andersen/GMW 1200	RFPS-1287-063	063
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-1298-127	127

(B) Particulate Matter (PM_{2.5}, PM₁₀ lo-vol, PM_C)

With the exception of continuous samplers and speciation samplers all PM_{2.5} samplers operated by MCAQ are either FRM or FEM samplers. Listed below are the applicable USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

<u>Method</u>	<u>Designation Number</u>	<u>Method Code</u>
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-0498-118	118
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-1298-127	127
R & P TEOM (Continuous)	NA	(716,717)
MetOne Beta Attenuation Sampler (Continuous)	NA	(731)

(C) PM_{2.5} Speciation sampling and analysis

In addition to operating PM_{2.5} samplers that determine only PM_{2.5} mass values, MCAQ also operates PM_{2.5} speciation samplers that collect samples that are analyzed to determine the chemical makeup of PM_{2.5}. Data collected using this method cannot be compared to the NAAQS. Listed below is the method used in the MCAQ monitoring network:

<u>Method</u>	<u>Designation Number</u>	<u>Method Code</u>
MetOne SASS	NA	810
URG-3000N (Carbon Channel)	NA	Various

(D) Sulfur Dioxide

Instruments used to continuously monitor sulfur dioxide levels in the atmosphere employ the pulsed UV fluorescence method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

<u>Method</u>	<u>Designation Number</u>	<u>Method Code</u>
Thermo Electron 43A, 43C-TLE, 43i	EQSA-0486-060	560

(E) Carbon Monoxide

Continuous monitoring for carbon monoxide is performed by use of the non-dispersive infrared (gas filter correlation) method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Electron or Thermo Environmental Instruments 48, 48C, 48i	RFCA-0981-054	054
Teledyne API Model 300EU	RFCA-1093-093	593

(F) Ozone

Ozone is monitored using the UV photometry method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Electron or Thermo Environmental Instruments 49, 49C, 49i	EQOA-0880-047	047

(G) Nitrogen Dioxide

The chemiluminescence method is used in monitoring the nitrogen dioxide level in the ambient air. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Environmental Instr. 42, 42C, 42i	RFNA-1289-074	074

(H) Reactive Oxides of Nitrogen

The chemiluminescence method is used in monitoring the reactive oxides of nitrogen levels in the ambient air. Listed below is the instrumentation used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Environmental Instr. 42C-Y	NA	574

(I) Lead (Pb)

The PM10 lo-vol method will be used for monitoring lead. Analysis for lead in PM10 collected on the filters will be conducted in accordance with 40 CFR 50, Appendix Q. Lead analysis will begin January 1, 2011, if funding is available. Listed below is the instrumentation proposed to be used in the MCAQ monitoring network:

Method	Designation Number	Method Code
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-1298-127	127

7. Quality Assurance Status

MCAQ has an extensive quality assurance program to ensure that all air monitoring data collected meets established criteria for precision and bias. MCAQ operates according to EPA approved Quality Assurance Project Plans (QAPP) and Standard Operating Procedures. Staff members audit instrumentation on a scheduled basis to ensure that each instrument is calibrated and operating properly. Data validation is performed monthly to

ensure data reported by each instrument is recorded accurately in the air quality monitoring database.

8. Scale of Representativeness

Each station in the monitoring network must be described in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

(a) Microscale - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

(b) Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

(c) Neighborhood scale – defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers.

(d) Urban scale - defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.

(e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Closely associated with the area around the monitoring station where pollutant concentrations are reasonably similar are the basic monitoring exposures of the station. There are six basic exposures:

(a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.

(b) Sites located to determine representative concentrations in areas of high population density.

(c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.

(d) Sites located to determine general background concentration levels.

(e) Sites located to determine the extent of regional pollutant transport among populated areas; and in support of secondary standards.

(f) Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts.

The design intent in siting stations is to correctly match the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the

monitoring objective of the station. The following relationship of the six basic objectives and the scales of representativeness are appropriate when siting monitoring stations:

Site Type	Appropriate Siting Scales
1. Highest concentration.....	Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants).
2. Population oriented.....	Neighborhood, urban.
3. Source impact.....	Micro, middle, neighborhood.
4. General/background & regional transport.....	Urban, regional.
5. Welfare-related impacts...	Urban, regional.

Table 2.

9. Data Processing and Reporting

All ambient air quality data are stored in the Environmental Data Acquisition System (EDAS) database located on the 2nd floor of the Hal Marshall County Services Center, 700 North Tryon Street, Suite 205, Charlotte, North Carolina. On a daily basis the EDAS data are backed up to CD. A weekly CD backup of the database is maintained at an off-site location. After all monthly data validation procedures are successfully completed, data is transmitted to the USEPA's national Air Quality System (AQS) database. The AQS database is maintained by EPA as the official repository of the fully quality assured ambient air quality dataset.

III. NETWORK SUMMARY

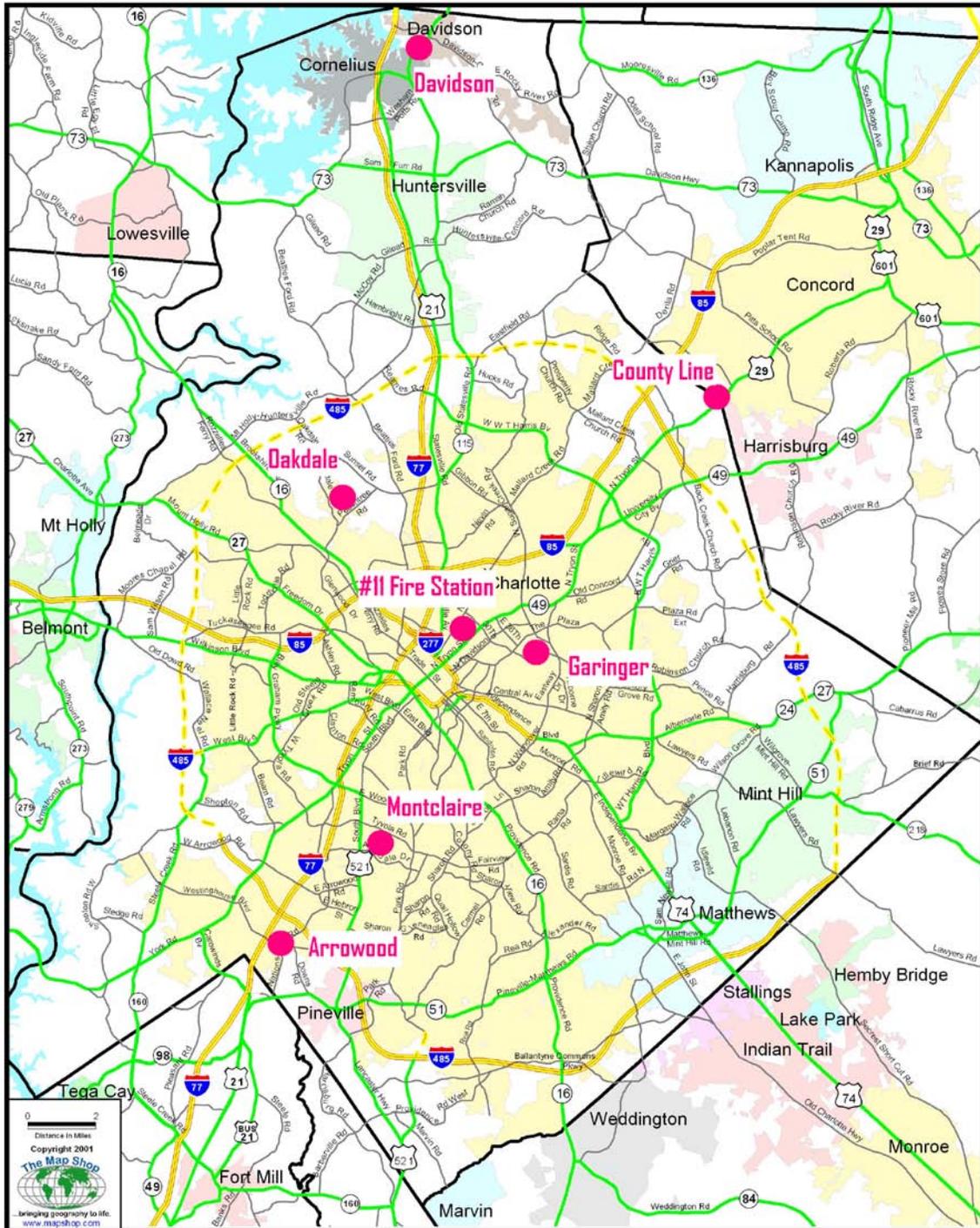
1. Site Table and Criteria Pollutants Monitored

Site	AQS ID #	CO	NO ₂	O ₃	Pb	PM _{2.5}	PM ₁₀	SO ₂	PM _C
#11 Fire Station	37-119-0003						X hi- vol		
Arrowood	37-119-1005			X			X hi- vol		
County Line	37-119-1009			X					
Davidson	37-119-1001						X hi- vol		
Garinger	37-119-0041	X	X	X	2011	X	X lo- vol	X	X
Montclair	37-119-0042				2011	X	X lo- vol		X
Oakdale	37-119-0043					X			

Table 3.

2. Site Map

AIR QUALITY MONITORING STATIONS MECKLENBURG COUNTY, NC 2010



● = Monitoring Site.

Figure 1. (Ref. 5.)

3. Monitoring Methods

Site	Parameter	Instrument / Method	Meth. Num. ¹	Param. Num. ²	MT ³
37-119-0003	PM10	FRM-Hi Vol	063	81102	SLAMS
37-119-0041	Barometric Pressure	R. M. Young	011	64101	SLAMS
37-119-0041	CO, POC 1	Gas Filter Correlation	054	42101	SLAMS
37-119-0041	CO, POC 3, Trace	Gas Filter Correlation	593	42101	SLAMS NCore
37-119-0041	Dew Point	Vasaila	020	62103	SLAMS
37-119-0041	NO	Chemi-luminescence	074	42601	SLAMS
37-119-0041	NO2	Chemi-luminescence	074	42602	SLAMS
37-119-0041	NOx	Chemi-luminescence	074	42603	SLAMS
37-119-0041	NO, POC 2	Chemi-luminescence	574	42601	SLAMS NCore
37-119-0041	NOy, POC 2	Chemi-luminescence	574	42600	SLAMS NCore
37-119-0041	Outdoor Temperature	R. M. Young	020	62101	SLAMS NCore
37-119-0041	Ozone	UV Photometric	047	44201	SLAMS NCore
37-119-0041	PM2.5	TEOM	716	88501	SLAMS
37-119-0041	PM2.5	TEOM	717	88502	SLAMS NCore
37-119-0041	PM2.5	FRM	118	88101	SLAMS NCore
37-119-0041	PM2.5	Speciation	810	Multiple	TRENDS CSN
37-119-0041	Precipitation	R. M. Young	011	65102	SLAMS
37-119-0041	Relative Humidity	Vasaila	012	62201	SLAMS NCore
37-119-0041	SO2, POC 2	Pulsed UV Fluorescent	560	42401	SLAMS NCore

Site	Parameter	Instrument / Method	Meth. Num. 1	Param. Num. 2	MT ³
37-119-0041	Solar Radiation	Matrix	011	63301	SLAMS
37-119-0041	PM10-2.5 Coarse	FRM-Lo Vol (LC)	118	86502	SLAMS NCore
37-119-0041	PM10	FRM-Lo Vol (LC)	127	85101	SLAMS
37-119-0041	PM10	FRM-Lo Vol (STP)	127	81102	SLAMS
37-119-0041	Wind Direction	R. M. Young	020	61104	SLAMS NCore
37-119-0041	Wind Speed	R. M. Young	020	61103	SLAMS NCore
37-119-0041	PM2.5, POC 4	MetOne	731	88501	SPM
37-119-0042	PM2.5	TEOM	716	88501	SLAMS
37-119-0042	PM2.5	TEOM	717	88502	SLAMS
37-119-0042	PM2.5	FRM	118	88101	SLAMS
37-119-0042	PM10-2.5 Coarse	FRM-Lo Vol (LC)	118	86502	SLAMS
37-119-0042	PM10	FRM-Lo Vol (LC)	127	85101	SLAMS
37-119-0042	PM10	FRM-Lo Vol (STP)	127	81102	SLAMS
37-119-0043	PM2.5	FRM	118	88101	SLAMS
37-119-1001	PM10	FRM-Hi Vol	063	81102	SLAMS
37-119-1005	Ozone	UV Photometric	047	44201	SLAMS
37-119-1005	PM10	FRM-Hi Vol	063	81102	SLAMS
37-119-1009	Ozone	UV Photometric	047	44201	SLAMS

Table 4.

1- Meth. Num. = Method Number

2- Param. Num. = Parameter Number

3- MT = Monitor Type:

SLAMS - State and Local Air Monitoring Station

SPM - Special Purpose

NON - Non-regulatory

TRENDS - Trends Speciation, CSN – Chemical Speciation Network

4. Network Modifications

(A) Monitoring Station Siting Modifications

1. Lead (Pb) Monitoring:

A revised NAAQS for lead (Pb) was published on October 15, 2008. The level of the NAAQS was effectively lowered by an order of magnitude from 1.5 $\mu\text{g}/\text{m}^3$ to 0.15 $\mu\text{g}/\text{m}^3$. The new NAAQS requires two types of monitoring: source oriented monitoring (currently sources with emissions > 1 tpy require monitoring, proposed to be lowered to 0.5 tpy) and population oriented monitoring. EPA analyses and examination of permit records indicates there are no sources within the boundaries of Mecklenburg County that would require source oriented monitoring under the current or proposed emissions threshold. Population oriented monitoring may be required. EPA is currently evaluating siting criteria for source oriented and population oriented lead monitoring and has instructed monitoring agencies to plan to operate population oriented lead instruments at NCore monitoring stations.

MCAQ is planning to begin operation of lead monitoring at station 37-119-0041 (NCore site) to comply with proposed EPA requirements for population oriented monitoring. MCAQ will also operate a lead monitoring site at 37-119-0042 to comply with monitor collocation requirements for determination of method analytical precision in the monitoring network.

MCAQ will use the PM10 lo-vol method to collect atmospheric samples for lead analysis. Monitoring will be conducted using the R & P Partisol-Plus 2025 PM-2.5 Sequential Sampler, RFPS-1298-127, Method 127 or the latest version of this sampler, manufactured by Thermo-Fisher, Inc. (Model 2025). These samplers are currently installed and in operation at these stations (noted above) providing PM10 measurements. The filters collected on the PM10 samplers will be analyzed for lead in accordance with 40 CFR 50 Appendix Q. Lead analysis may begin January 1, 2011, if funding is available.

2. PM10 Monitoring:

MCAQ currently operates three PM10 hi-vol stations to comply with the monitoring requirements of 2-4 monitoring stations in areas of low-concentration (<80% of NAAQS) for MSA's with populations > 1,000,000 (40 DFR 58 Appendix D, Table D-4). In 2008, two additional PM10 lo-vol stations were installed to allow measurement of PM10-2.5 (PM coarse). The installation of the lo-vol samples brings the total number of PM10 monitoring station operated in the MSA to five.

MCAQ plans to terminate monitoring at two PM10 hi-vol sites on December 31, 2010. PM10 monitoring will be terminated at the following sites:

Davidson	37-119-1001-81102
Arrowood	37-119-1005-81102

MCAQ will continue to monitor PM10 concentrations in compliance with the minimum requirements (40 CFR 58 Appendix D § 4.6) at the three remaining stations:

Garinger	37-119-0041-81102
Montclair	37-119-0042-81102
#11 Fire Station	37-119-0003-81102

(B) Instrumentation Operation Modifications

Thermo Environmental Model 48c Carbon Monoxide Analyzer, 37-119-0041:

Currently two carbon monoxide monitoring instruments are operating at site 37-119-0041. A Thermo Environmental Model 48c (Thermo CO) has been in operation as POC 1 at this site since November 11, 1999. The analyzer is used to monitor carbon monoxide concentrations as a federal reference method to determine compliance with the carbon monoxide NAAQS. A Teledyne API Model 300eu (TAPI CO) has been in operation as POC 3 at the site (37-119-0041) since April 27, 2005 as part of the NCore monitoring network. Initially, the TAPI instrument did not have designation as a federal reference or equivalent method. The original TAPI CO analyzer was replaced on May 9, 2008 with a new Model 300eu unit that had received USEPA designation as a Federal Reference Method (RFCA 1093-093). Beginning on January 1, 2011, the TAPI unit will be operated for both NAAQS compliance determination and as the NCore monitoring instrument. Operation of the Thermo CO unit will be discontinued on December 31, 2010. Standard operating procedures (SOP) for the TAPI CO will be modified to allow operation over an extended range that will bracket the eight hour CO NAAQS (9 ppm).

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IV. AIR MONITORING STATION DESCRIPTIONS

1. #11 Fire Station

(A) #11 Fire Station Site Table

Site Name: #11 Fire Station				
AQS Site Identification Number: 37-119-0003				
Location: 620 West 28 th Street				
Charlotte, NC 28206				
Latitude: N35.251717°		Datum: WGS84		
Longitude: W80.824717°				
Elevation: 223 meters				
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM10	Gravimetric	63	6	1 in 6 day
PM10 Collocated	Gravimetric	63	6	1 in 6 day
Date Monitor Established:		PM10	October 1, 1992	
Date Monitor Established:		PM10 Collocated	June 8, 1996	
Nearest Road:	Bancroft Street	Distance to Road:	25 meters	
Traffic Count:	300	Year of Count:	2001	
MSA: Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)			MSA #:	16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
8625	8777	16355	18677	

Table 5.

(B) #11 Fire Station Site Description and Statement of Purpose

A PM₁₀ monitor has been located on the roof of #11 Fire Station (620 W. 28th Street) since 10/01/1992. A collocated sampler has been located 2.9 m NE of the reporting sampler since 06/08/1996. The site is located 3.2 kilometers NE of the central business district at latitude N35.251717° and longitude W80.824717°. The site elevation is 223 meters above sea level. The nearest road is Bancroft Street (ADT=300, 2001) at a distance of 25.3 meters from the sample inlet. Prior to the installation of the PM₁₀ sampler, a TSP sampler was located at this site (11/03/1966 to 10/01/1992).

The inlet of the sampler is 6.4 meters above ground level and 1.5 meters above roof level. The area is a transition zone of business (≈50%) to residential (≈50%) within a 1 km radius. The PM₁₀ sampler is a SLAMS.

A motor vehicle emissions evacuation device exhaust stack is located 8.8 meters from the PM₁₀ sampler and 10.0 meters from the collocated sampler. This device activates when vehicles are operated for emergency response and routine maintenance. The device exhausts tailpipe emissions from vehicles to protect personnel from exposure to exhaust gases that might otherwise be trapped in the garage. Operation is intermittent.

The sampling frequency for PM₁₀ is 1 in 6 day sampling. The sampling interval is 24 hours, from midnight to midnight every sixth day.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. PM₁₀ monitoring at this site will be terminated on December 31, 2010. Please see *Section 4. Network Modifications, (A), 2.* for further information.

OBJECTIVE AND SPATIAL SCALE

The #11 Fire Station sampling site is representative of particulate concentrations in a mixed industrial, commercial, and residential area. The PM₁₀ monitoring site objective is to determine representative concentrations in an area of high population density (population exposure) and to measure potential maximum PM₁₀ concentrations in the network. #11 Fire Station is a neighborhood scale site. Data is used to assess compliance with the particulate NAAQS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) #11 Fire Station Aerial Photograph

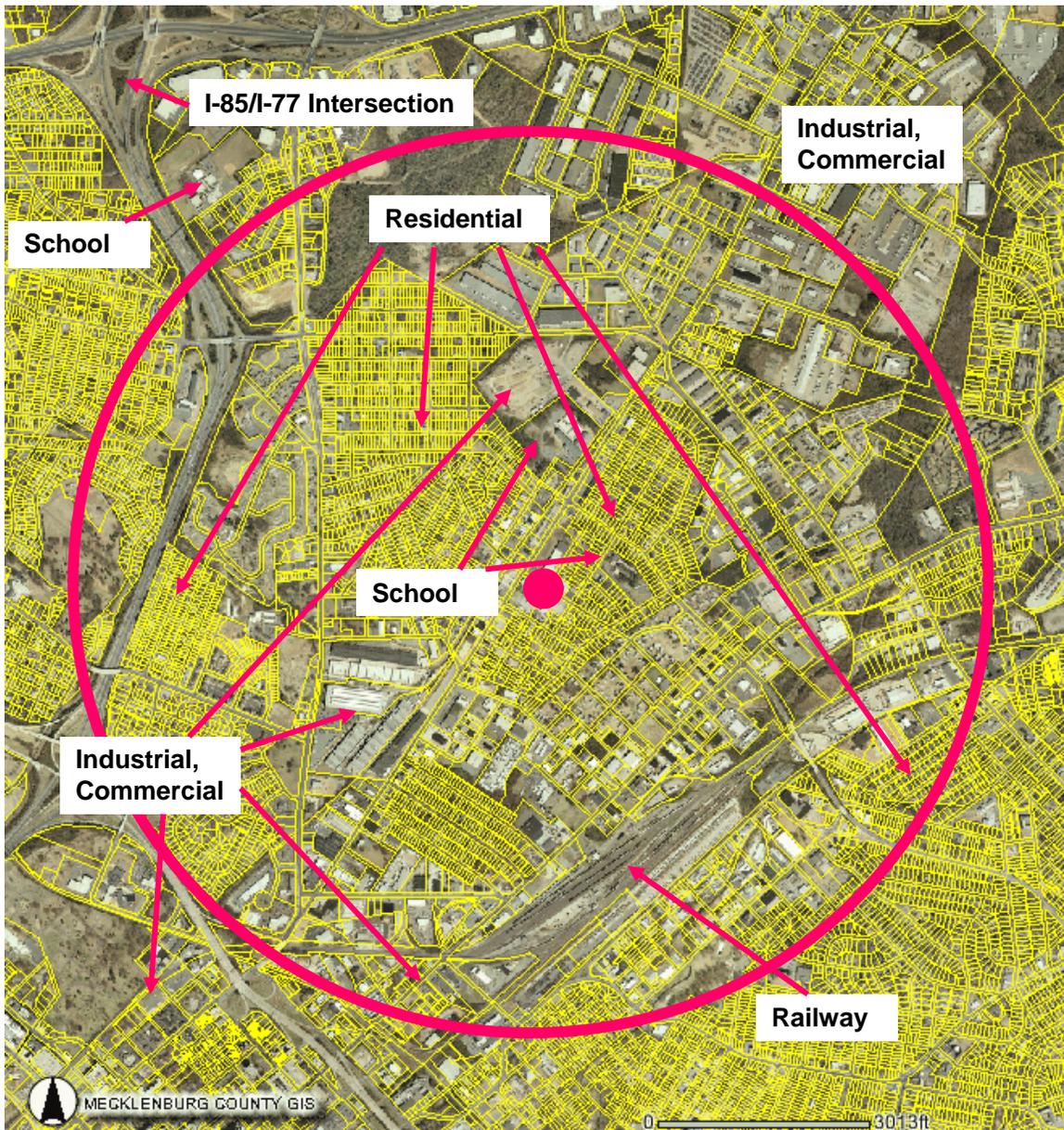


Figure 5. #11 Fire Station aerial photograph with 4 km diameter circle.

(D) #11 Fire Station Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

2. Arrowood

(A) Arrowood Site Table

Site Name: Arrowood				
AQS Site Identification Number: 37-119-1005				
Location: 400 Westinghouse Boulevard				
Charlotte, NC 28273				
Latitude: N35.113400°		Datum: WGS84		
Longitude: W80.919706°				
Elevation: 195 meters				
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
Ozone	UV Photometry	47	5	April 1 – Oct. 31, Continuous
PM10	Gravimetric	63	4	1 in 6 day
Date Monitor Established:		Ozone	June 6, 1980	
Date Monitor Established:		PM10	January 1, 1991	
Nearest Road:	Westinghouse Boulevard	Distance to Road:	63 meters	
Traffic Count:	21700	Year of Count:	2003	
MSA: Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)			MSA #:	16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
2757	2786	13438	15905	

Table 6.

(B) Arrowood Site Description and Statement of Purpose

The Arrowood site monitors ozone and PM₁₀. The site is located at 400 Westinghouse Boulevard, 14.5 kilometers SW of the central business district and 0.4 kilometers east of I-77 at latitude N35.113164° and longitude W80.919532°. The site elevation is 195 meters. The nearest road, Westinghouse Boulevard, is 63 meters from the inlets and has a daily traffic flow of 21700 vehicles (2003). The nearest tallest building is a small strip shopping center (Height = 5.6 meters). The inlets are 15 meters from the shopping center. The ozone inlet is 5.4 meters above the ground and 2.8 meters above the roof of the monitoring station. The PM₁₀ inlet is 4.1 meters above the ground and 1.5 meters above the roof of the monitoring station. The inlets are 2 meters apart. There is unrestricted airflow in at least a 270° arc of exposure, including the predominant SW wind direction. The area is a mixture of commercial and industrial business. The ozone analyzer is the first of three oriented along the primary summer wind vector (SW to NE),

which intersects the central business district. The ozone and PM₁₀ monitors are both SLAMS.

The ozone instrument is operated during the North Carolina ozone monitoring season which begins April 1 and ends October 31. The ozone instrument operates continuously during this period.

The sampling frequency for PM₁₀ is 1 in 6 day sampling. The sampling interval is 24 hours, from midnight to midnight every sixth day.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. PM₁₀ monitoring at this site will be terminated on December 31, 2010. Please see *Section 4. Network Modifications, (A), 2.* for further information. It is recommended that the current site status for ozone monitoring be maintained.

OBJECTIVE AND SPATIAL SCALE

The monitoring objectives of the ozone instrument are to measure: 1) upwind background ambient concentrations and 2) population exposure.

The monitoring objective of the PM₁₀ instrument is source oriented.

The site is a neighborhood spatial scale for ozone and PM₁₀. Data from this site is used to assess compliance with the NAAQS for ozone and PM₁₀.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) Arrowood Aerial Photograph

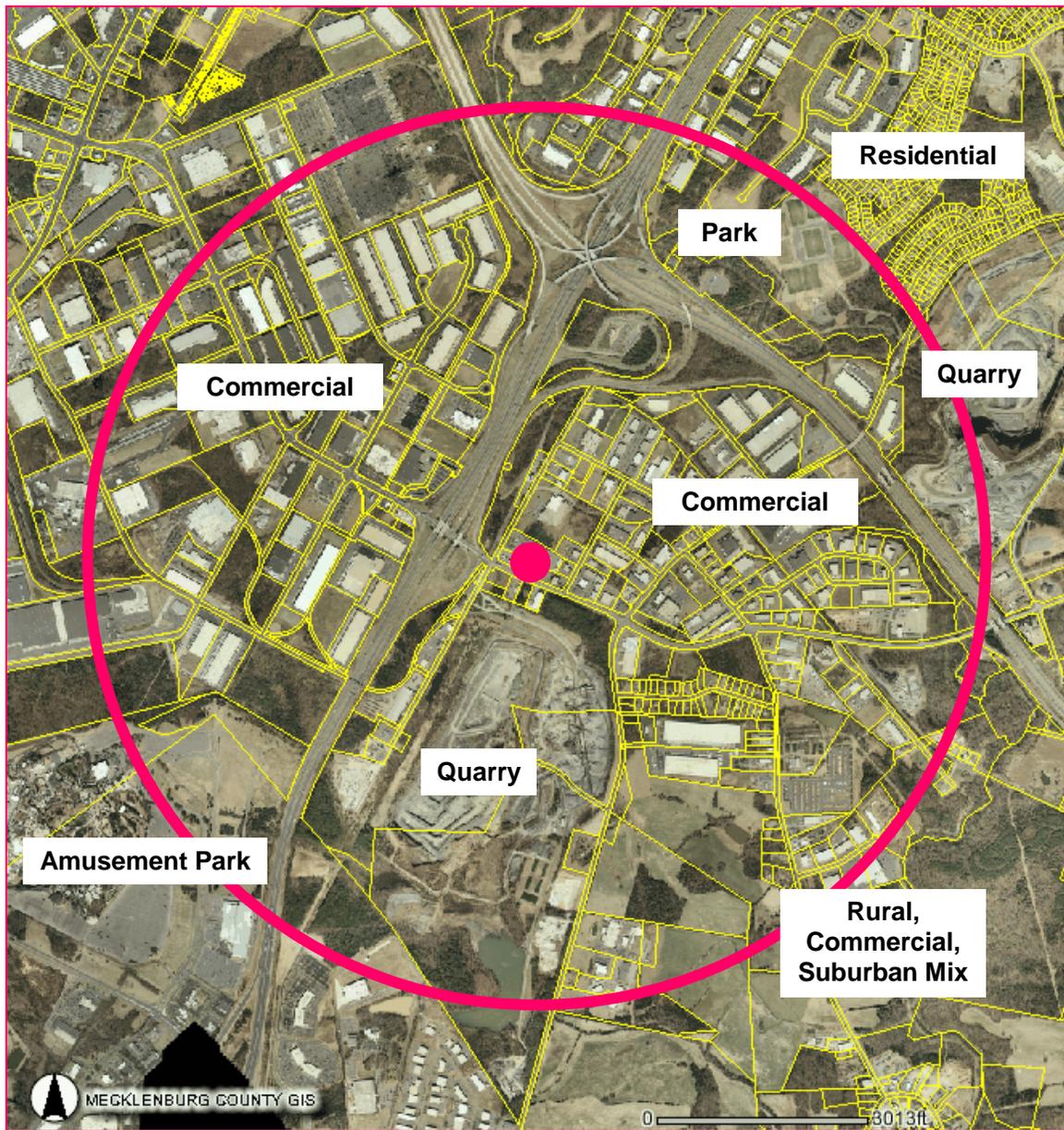


Figure 6. Arrowood aerial photograph with 4 km diameter circle.

(D) Arrowood Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

3. County Line

(A) County Line Site Table

Site Name: County Line					
AQS Site Identification Number: 37-119-1009					
Location: Highway 29 North at Hudspeth Road					
Charlotte, NC 28262					
Latitude:	N35.348752°			Datum: WGS84	
Longitude:	W80.693402°				
Elevation:	216 meters				
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule	
Ozone	UV Photometry	47	4	April 1 – Oct. 31, Continuous	
Date Monitor Established:		Ozone	November 9, 1979		
Nearest Road:	NC Highway 29	Distance to Road:	128 meters		
Traffic Count:	22400	Year of Count:	2002		
MSA: Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)				MSA #:	16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection		
1019	1116	27782	34989		

Table 7.

(B) County Line Site Description and Statement of Purpose

The County Line site is located near Highway 29 North at the Mecklenburg/Cabarrus County line. It has monitored ozone since 11/09/1979. The site is located 20 kilometers NE of the central business district at latitude N35.348752° and longitude W80.693402°. The site elevation is 216 meters. The nearest road is NC Highway 29, which is 128 meters from the probe and has a daily traffic count of 22400 (2002). The monitoring building is located in a large grass field near the Mecklenburg County-Cabarrus County line. The probe inlet is 4.1 meters above the ground and 1.7 meters from the roof of the monitoring building.

The site is located downwind from the central business district. It is the last of three analyzers oriented along the primary summer wind vector (SW to NE) which intersects the central business district. The site should measure peak ozone concentrations.

The ozone monitor was a NAMS monitoring site through December 31, 2006. The site type was changed to SLAMS by USEPA on January 1, 2007 in accordance with the

revised 40CFR58 monitoring rules published October 17, 2006. Data is used to assess compliance with the NAAQS.

The ozone instrument is operated during the North Carolina ozone monitoring season which begins April 1 and ends October 31. The ozone instrument operates continuously during this period.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. There are no proposed changes for this site. It is recommended that the current site status be maintained.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the County Line ozone site is to determine the highest concentrations expected to occur in the area covered by the network. This site is considered an urban scale site which represents ozone levels over several kilometers. Data from this site is used to assess compliance with the NAAQS for ozone.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) County Line Aerial Photograph

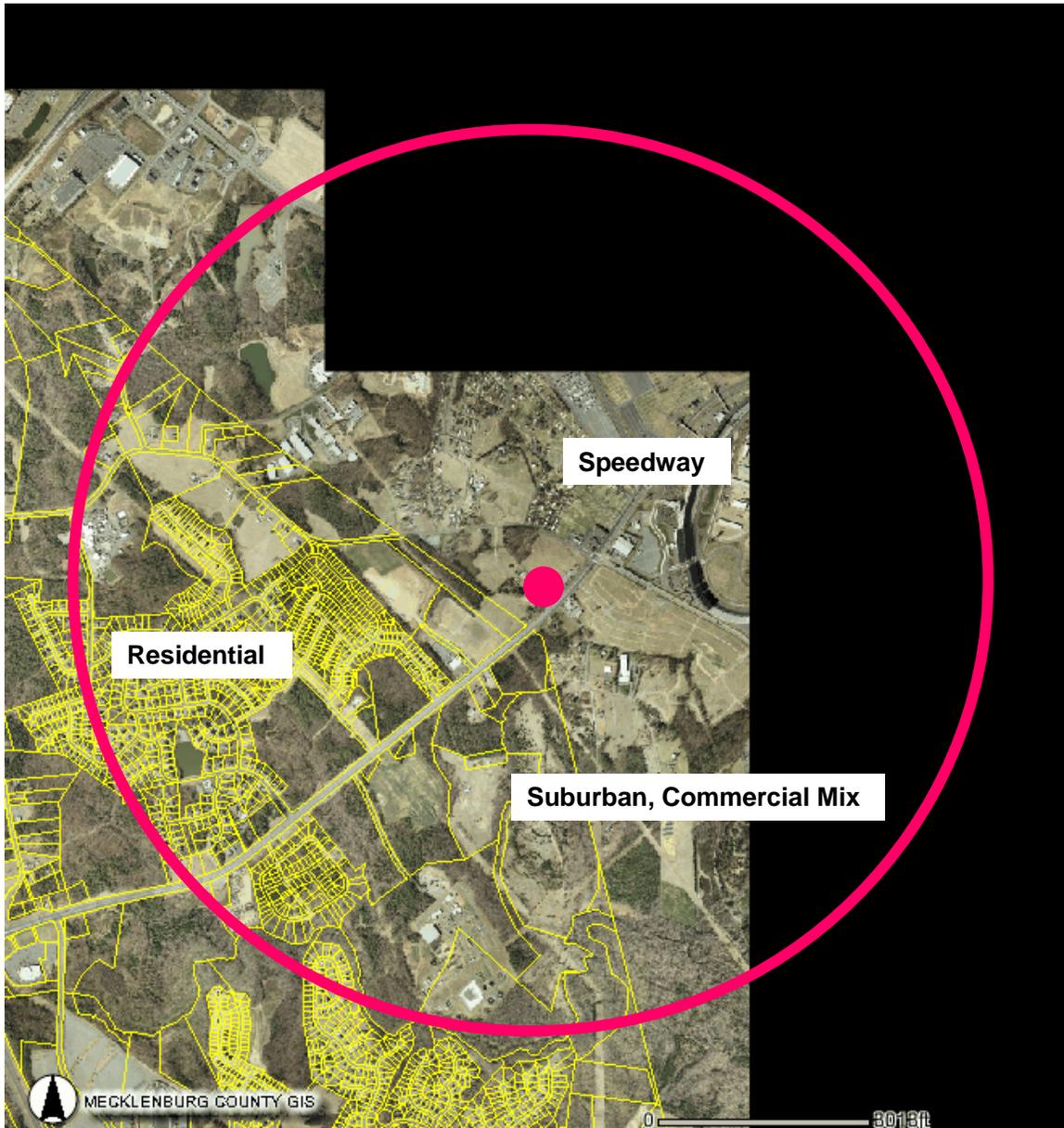


Figure 7. County Line aerial photograph with 4 km diameter circle.

(D) County Line Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

4. Davidson

(A) Davidson Site Table

Site Name: Davidson				
AQS Site Identification Number: 37-119-1001				
Location: 310 West Walnut Street				
Davidson, NC 28036				
Latitude: N35.498433°		Datum: WGS84		
Longitude: W80.852585°				
Elevation: 252 meters				
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM10	Gravimetric	63	5	1 in 6 day
Date Monitor Established: PM10 April 1, 1992				
Nearest Road: 310 West Walnut Street		Distance to Road: 55 meters		
Traffic Count: <1000		Year of Count: Estimated		
MSA: Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)				MSA #: 16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
6685	7461	15327	17383	

Table 8.

(B) Davidson Site Description and Statement of Purpose:

A PM₁₀ sampler has been located at 310 West Walnut St. on a cistern at the Davidson Filter plant since 04/01/1992. A TSP monitor was located at this site on the roof of the filter plant main building from 03/19/1966 to 04/01/1992. The site is located 30 kilometers N of the central business district at latitude N35.498433° and longitude W80.852585°. The site elevation above sea level is 252 meters. The nearest road is West Walnut Street at a distance of 54.7 meters. The estimated daily traffic flow is <1000 vehicles. The inlet is 4.8 meters above the ground and 1.5 meters from the roof. The area is residential. The PM₁₀ sampler is a SLAMS.

The sampling frequency for PM₁₀ is 1 in 6 day sampling. The sampling interval is 24 hours, from midnight to midnight every sixth day.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. PM₁₀ monitoring at this site will be terminated on December 31, 2010. Please see *Section 4. Network Modifications, (A), 2.* for further information.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Davidson PM₁₀ site is population exposure. The Davidson Filter plant site is a neighborhood spatial scale. Data is used to assess trends and compliance to the NAAQS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) Davidson Aerial Photograph

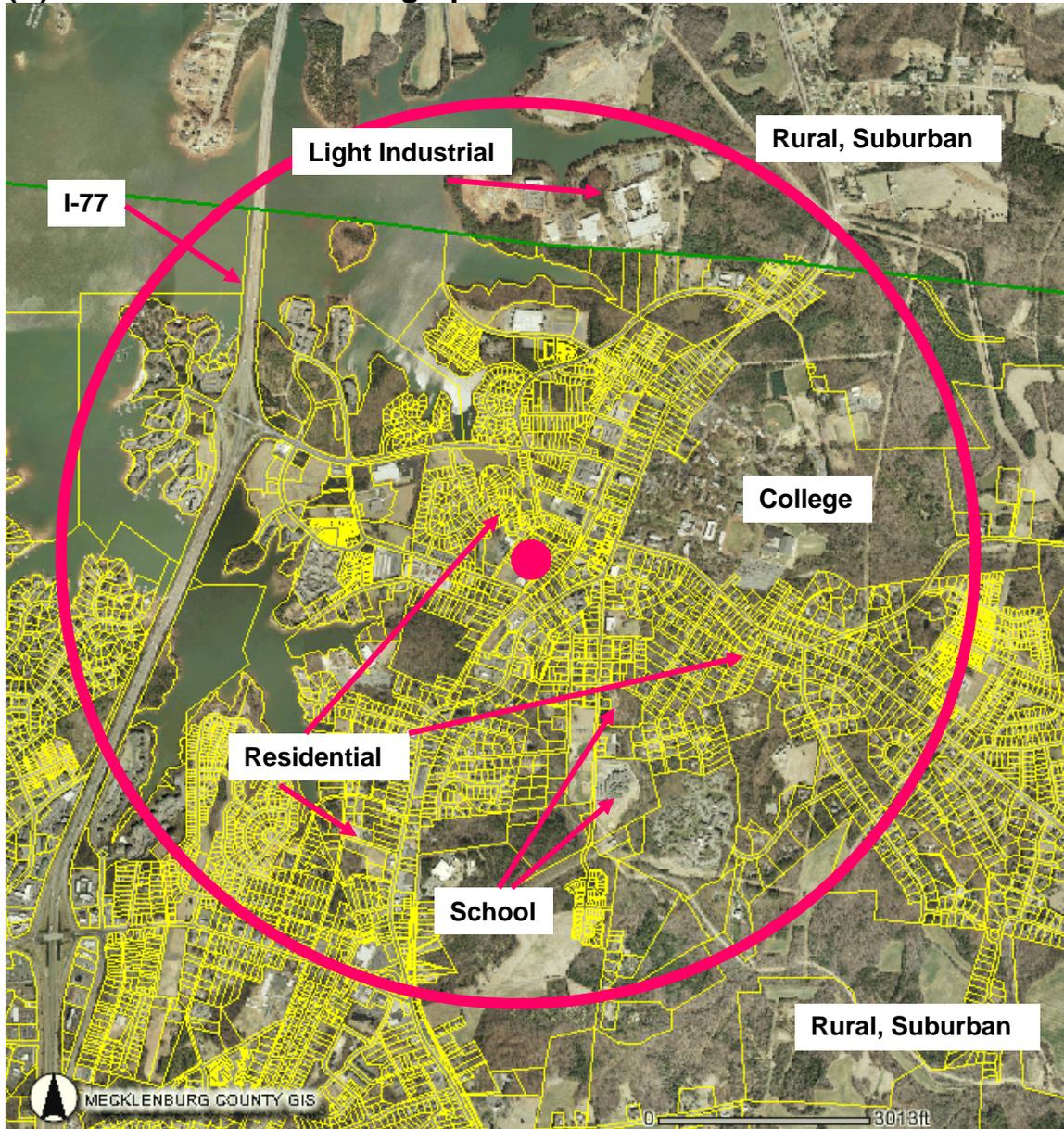


Figure 8. Davidson aerial photograph with 4 km diameter circle.

(D) Davidson Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

5. Garinger

(A) Garinger Site Table

Site Name: Garinger

AQS Site Identification Number: 37-119-0041

Location: 1130 Eastway Drive

Charlotte, NC 28205

Latitude: N35.240100°

Datum: WGS84

Longitude: W80.785683°

Elevation: 232 meters

Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
Ozone	UV Photometry	47	5	Continuous
PM _{2.5}	FRM Gravimetric	118	5	1 in 1 day
PM _{2.5}	MetOne, Speciation	810	5	1 in 3 day
PM _{2.5}	URG-3000n, Carbon Speciation		5	1 in 3 day
PM _{2.5}	TEOM, Continuous	716,717	5	Continuous
PM ₁₀ FRM	FRM Lo-Vol Gravimetric	127	5	1 in 3 day
PM _{10-2.5} Coarse	FRM difference	118	5	1 in 3 day
NO ₂	Chemiluminescence	74	5	Continuous
CO	NDIR, GFC	54	5	Continuous
SO ₂ Precursor Gas	UV Pulsed Fluorescence	560	5	Continuous
CO Precursor Gas	NDIR, GFC	593	5	Continuous
NOy Precursor Gas	Chemiluminescence	574	5	Continuous
Wind Speed	R. M. Young	20	10	Continuous
Wind Direction	R. M. Young	20	10	Continuous
Pressure	R. M. Young	11	2	Continuous
Outdoor Temperature	R. M. Young	20	3	Continuous
Solar Radiation	Matrix	11	3	Continuous
Precipitation	R. M. Young	11	4	Continuous
Dew Point	Vaisala	20	3	Continuous

Relative Humidity	Vaisala	20	3	Continuous
Date Monitor Established:	Ozone			March 3, 2000
Date Monitor Established:	PM _{2.5} FRM			July 30, 1999
Date Monitor Established:	PM _{2.5} Speciation (MetOne)			January 13, 2001
Date Monitor Established:	PM _{2.5} Speciation (URG)			February 27, 2009
Date Monitor Established:	PM _{2.5} TEOM			November 1, 1999
Date Monitor Established:	PM ₁₀ FRM			April 1, 2008
Date Monitor Established:	PM _{10-2.5} Coarse			April 1, 2008
Date Monitor Established:	NO ₂			November 12, 1999
Date Monitor Established:	CO			November 11, 1999
Date Monitor Established:	SO ₂ Precursor Gas			January 1, 2006
Date Monitor Established:	CO Precursor Gas			January 1, 2006
Date Monitor Established:	NO _y Precursor Gas			May 4, 2007
Date Monitor Established:	Meteorological Parameters			January 1, 2003 (latest)
Nearest Road:	Shamrock Drive	Distance to Road:	298 meters	
Traffic Count:	12800	Year of Count:	2003	
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)			MSA #: 16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
10552	10633	42463	46841	

Table 9.

(B) Garinger Site Description and Statement of Purpose

The Garinger High School site is an NCore multi-pollutant site. The monitoring site is located at 1130 Eastway Drive. The site is located in a grassy area at the rear of Garinger High School near the left field line of the baseball field.

The site is located 5.6 kilometers ENE of the Charlotte, NC central business district at latitude N35.240100° and longitude W80.785683°. The site elevation is 232 meters above sea level. All sampler inlet probes are located at a height of 5 meters except for meteorological parameters. There is unrestricted airflow in at least a 270° arc of exposure, including the predominant southwest wind direction. Sample inlets are >20 meters from the nearest trees. The nearest road, Shamrock Drive, is 298 meters from the inlets and has a daily traffic flow of 12800 (ADT 2003). The ozone analyzer is the second of three oriented along the primary summer wind vector (SW to NE), which intersects the downtown area.

An everyday PM_{2.5} sequential monitor (est. 07/30/1999), a 1/3 day PM₁₀ sequential monitor (est. 04/01/2008), a PM_{2.5} Speciation monitor (MetOne SASS, est. 01/13/2001),

and a URG-3000n carbon sampler (est. 04/01/2009) are located on the roof of the building. Nitrogen Dioxide (est. 11/12/1999), Carbon Monoxide (est. 11/11/1999), Ozone (est.03/03/2000), Sulfur Dioxide (est. 11/15/1999), and continuous TEOM PM_{2.5} (est. 11/01/1999) monitors are located inside the monitoring shelter. A meteorological station is also located at the site. The meteorological station monitors wind speed (est. 04/12/2000), wind direction (04/12/2000), pressure (04/14/2000), temperature (10/06/2000), solar radiation (09/26/2000), precipitation (1/11/2002), dew point (11/1/2001), and relative humidity (1/11/2002).

The site is an NCore multi-pollutant monitoring site. Parameters monitored include trace-level CO (<5000 ppb, 1/1/2006), trace-level SO₂ (<200 ppb, 1/1/2006), and trace-level NO and NO_y (<200 ppb, 5/4/2007). The NCore gas instruments operate year round.

The ozone and CO monitors used for NAAQS determination were NAMS. USEPA re-designated them to SLAMS on January 1, 2007 in accordance with the revised 40 CFR 58 rules published on October 17, 2006. The re-designated SLAMS ozone and CO monitors are used for NAAQS determination. The PM_{2.5}-FRM, meteorological parameters, NO₂, trace-level SO₂, trace-level NO_y, and trace-level CO are SLAMS. The trace-level SO₂, trace-level NO_y, and trace-level CO are also NCore. The PM_{2.5}-FRM SLAMS monitor is used for NAAQS determination. The SLAMS NO₂ and SO₂ monitors are used for NAAQS determination. The PM_{2.5}-TEOM is designated as a SLAMS for AQI determination and forecasting purposes. The PM_{2.5} speciation monitor is part of the chemical speciation network (CSN). Data from this monitor (CSN) is not used for compliance determination. A MetOne BAM PM_{2.5} monitor (BAM) began operation on 1/1/2010. The BAM is operated as an SPM in a non-FEM configuration.

The Garinger site is an NCore site and as such must meet additional probe siting criteria. The meteorological tower at this site does not comply with the 10x rule for spacing from obstructions for meteorological measurements. (Please see the aerial photograph in Appendix A, Figure 3.) Due to terrain features in the Mecklenburg County region it is difficult to locate a site that meets the requirements of the EPA Volume 4 QA/QC guidance for wind speed and wind direction measurements. Large trees are a dominant landscape feature in the area. The closest terrain feature is 2.6x and is to the southeast of the WS/WD instrument. The next closest obstructions (trees) are to the west of the sensor at 3.4x. MCAQ's 2009 NCore Plan (Appendix A) was approved (Appendix B) as acceptable for WS/WD and included documentation noting the deviation from 10x siting criteria. Therefore, WS/WD monitoring is conducted at the current location as documented in the 2009 NCore Plan as approved by USEPA Region 4 and USEPA Office of Air Quality Planning and Standards (OAQPS).

NCore probe siting guidance for NO_y is a probe height of 10 meters. The NO_y probe inlet is currently mounted at a height of 5 meters. MCAQ plans to re-site the NO_y probe to a height of ≈10 meters prior to January 1, 2011.

A PM₁₀ lo-vol sampler was installed at this site on 4/1/2008. The PM₁₀ lo-vol samplers are used to determine PM_{10-2.5} (lc) and PM₁₀ (lc and stp).

Lead monitoring may begin at this site on January 1, 2011 as described in *Section 4. Network Modifications, (A), 1.*, if funded.

The site complies with the siting requirements of 40CFR58 for all other criteria air pollutants. There are no proposed changes for the siting of this station. It is recommended that the current site status be maintained.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Garinger ozone, CO, NO₂, SO₂, PM₁₀, and PM_{2.5} (FRM) monitors is to determine representative concentrations in areas of high population density (population exposure). Maximum concentrations for ozone and PM_{2.5} may be measured under stagnant meteorological conditions. This site is a neighborhood scale site for all parameters. Data from this site is used to assess compliance with the NAAQS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) Garinger Aerial Photograph

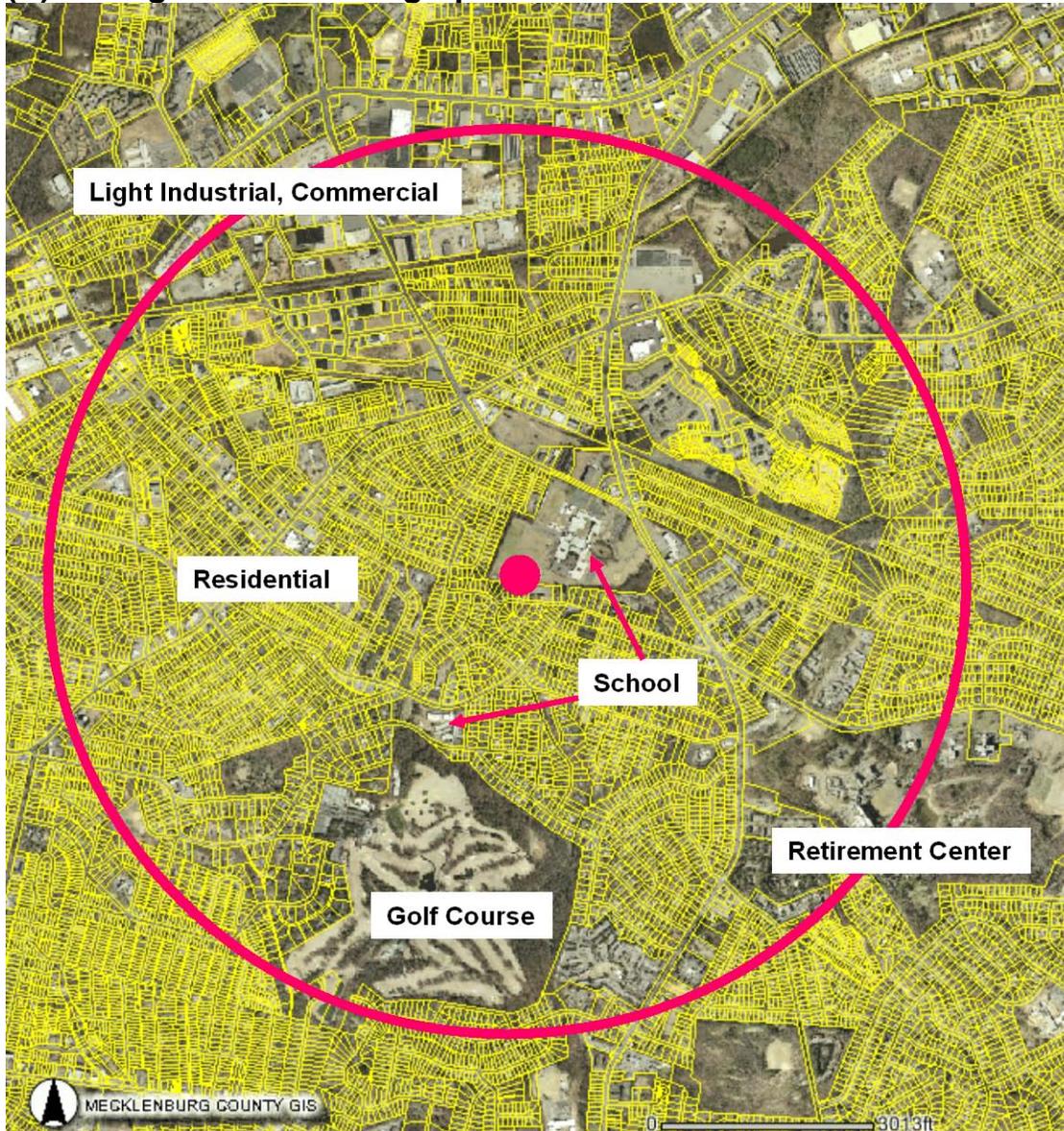


Figure 9. Garinger aerial photograph with 4 km diameter circle.

(D) Garinger Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

6. Montclair

(A) Montclair Site Table

Site Name:	Montclair			
AQS Site Identification Number:	37-119-0042			
Location:	1935 Emerywood Drive Charlotte, NC 28210			
Latitude:	N35.151283°	Datum:	WGS84	
Longitude:	W80.866983°			
Elevation:	209 meters			
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM _{2.5}	FRM	118	2	1 in 3 day
PM _{2.5}	FRM - Collocated	118	2	1 in 6 day
PM _{10-2.5}	FRM diff.	118	2	1 in 3 day
PM _{10-2.5}	FRM diff.- Collocated	118	2	1 in 6 day
PM _{2.5}	TEOM, Continuous	716, 717	2	Continuous
PM ₁₀	FRM- lo-vol	127	2	1 in 3 day
PM ₁₀	FRM- lo-vol - Collocated	127	2	1 in 6 day
Date Site Established:	PM _{2.5}	September 15, 2000		
Date Site Established:	PM _{2.5} Collocated	September 15, 2000		
Date Site Established:	PM _{2.5} TEOM	May 13, 2002		
Date Site Established:	PM ₁₀	July 1, 2008		
Date Site Established:	PM ₁₀ Collocated	July 1, 2008		
Nearest Road:	Emerywood Drive	Distance to Road:	70 meters	
Traffic Count:	2700	Year of Count:	1999	
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)		MSA #:	16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
6607	6560	32057	37595	

Table 10.

(B) Montclair Site Description and Statement of Purpose

A federal reference method (FRM) PM_{2.5} sampler and a collocated FRM sampler have been located at 1935 Emerywood Drive since 09/15/2000. The distance between the official and collocated PM_{2.5} FRM samplers is 2.7 meters. A TEOM PM_{2.5} was established 5/13/02. These monitors are situated in a grassy area between the school and a ball field. The site is located 8.6 kilometers SW of the central business district at latitude N35.151283° and longitude W80.866983°. The site elevation is 209 meters above sea level. The nearest road is Emerywood Drive (ADT=2700, 1999) at a distance of 70 meters from the sample inlets. The PM_{2.5} inlets are 2 meters above the ground. The PM_{2.5} is a SLAMS. The PM_{2.5}-TEOM is designated as a SLAMS for AQI determination and forecasting purposes. PM₁₀ lo-vol samplers (official and collocated) were installed at this site on 7/1/2008. The distance between the official and collocated PM₁₀ sampler inlets is 1.4 meters. The PM₁₀ lo-vol samplers are used to determine PM_{10-2.5} (lc) and PM₁₀ (lc and stp).

Lead monitoring may begin at this site on January 1, 2011 as described in *Section 4. Network Modifications, (A), I.*, if funded.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. There are no proposed changes for this site. It is recommended that the current site status be maintained.

OBJECTIVE AND SPATIAL SCALE

The Montclair PM₁₀ and PM_{2.5} sites are classified as neighborhood scale and the monitoring objective is population exposure in an area of potentially poor air quality. Data is used to assess compliance with the particulate NAAQS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) Montclair Aerial Photograph

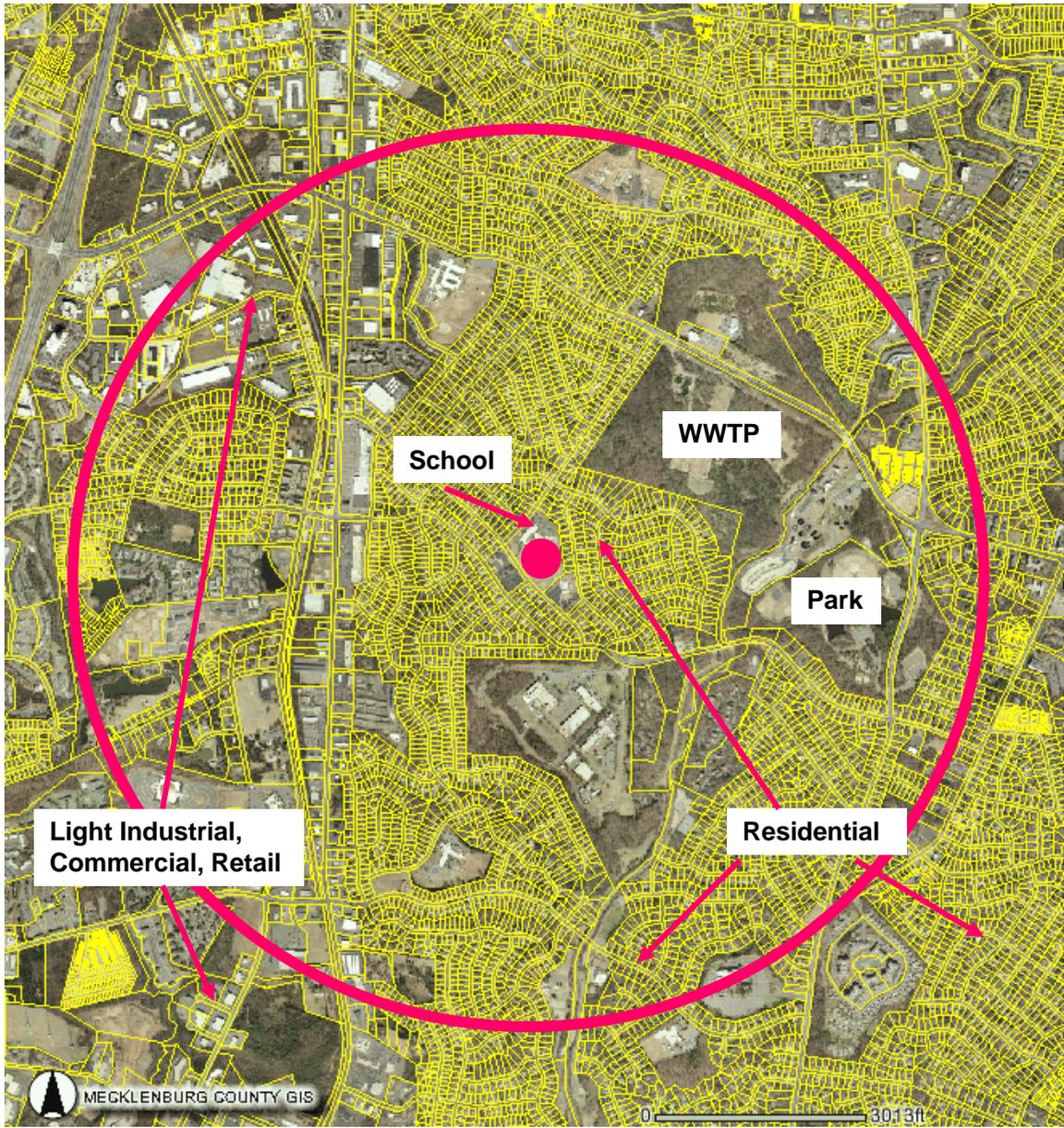


Figure 10. Montclair aerial photograph with 4 km diameter circle.

(D) Montclair Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

7. Oakdale

(A) Oakdale Site Table

Site Name: Oakdale				
AQS Site Identification Number: 37-119-0043				
Location: 513 Radio Road				
Charlotte, NC 28216				
Latitude: N35.304100°		Datum: WGS84		
Longitude: W80.888650°				
Elevation: 245 meters				
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM2.5	FRM	118	2	1 in 1 day
Date Site Established: PM2.5 January 1, 2006				
Nearest Road: Radio Road		Distance to Road: 36 meters		
Traffic Count: < 1000		Year of Count: Estimated		
MSA: Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2005)				MSA #: 16740
2006 Population (1 miles radius)	Projected 2010 Population (1 mile radius)	Population Census Blocks Within 1 mile 2009	Population Census Blocks Within 1 mile 2014 Projection	
9516	12319	26321	34903	

Table 11.

(B) Oakdale Site Description and Statement of Purpose

A federal reference method (FRM) PM_{2.5} sampler is located at the Oakdale monitoring site. The sampler has been in operation at 513 Radio Road since 01/01/2006. The monitor is located in a grass field at the entrance to the Sunset Hills Golf Course. The site is located 9.5 kilometers NW of the central business district at latitude N35.304100° and longitude W80.888650°. The site elevation is 245 meters above sea level. The nearest road is Radio Road (ADT estimated <1000) at a distance of 36 meters from the sample inlet. The PM_{2.5} inlet is 2 meters above the ground.

The sampling frequency for PM_{2.5} at this site is 1 in 1 day sampling. The sampling interval is 24 hours, from midnight to midnight every day.

The site complies with the siting requirements of 40CFR58 for criteria air pollutants. There are no proposed changes for this site. It is recommended that the current site status be maintained.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Oakdale PM_{2.5} site is population exposure and maximum concentration. The PM_{2.5} site is classified as a neighborhood scale. The Oakdale sampling site is representative of particulate concentrations in a residential area downwind of industrial and commercial emission sources west of the Charlotte central business district. Data is used to assess compliance with the particulate NAAQS. The PM_{2.5} monitor is a SLAMS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Anson County, NC; Cabarrus County, NC; Gaston County, NC; Mecklenburg County, NC; Union County, NC; and York County, SC.

(C) Oakdale Aerial Photograph

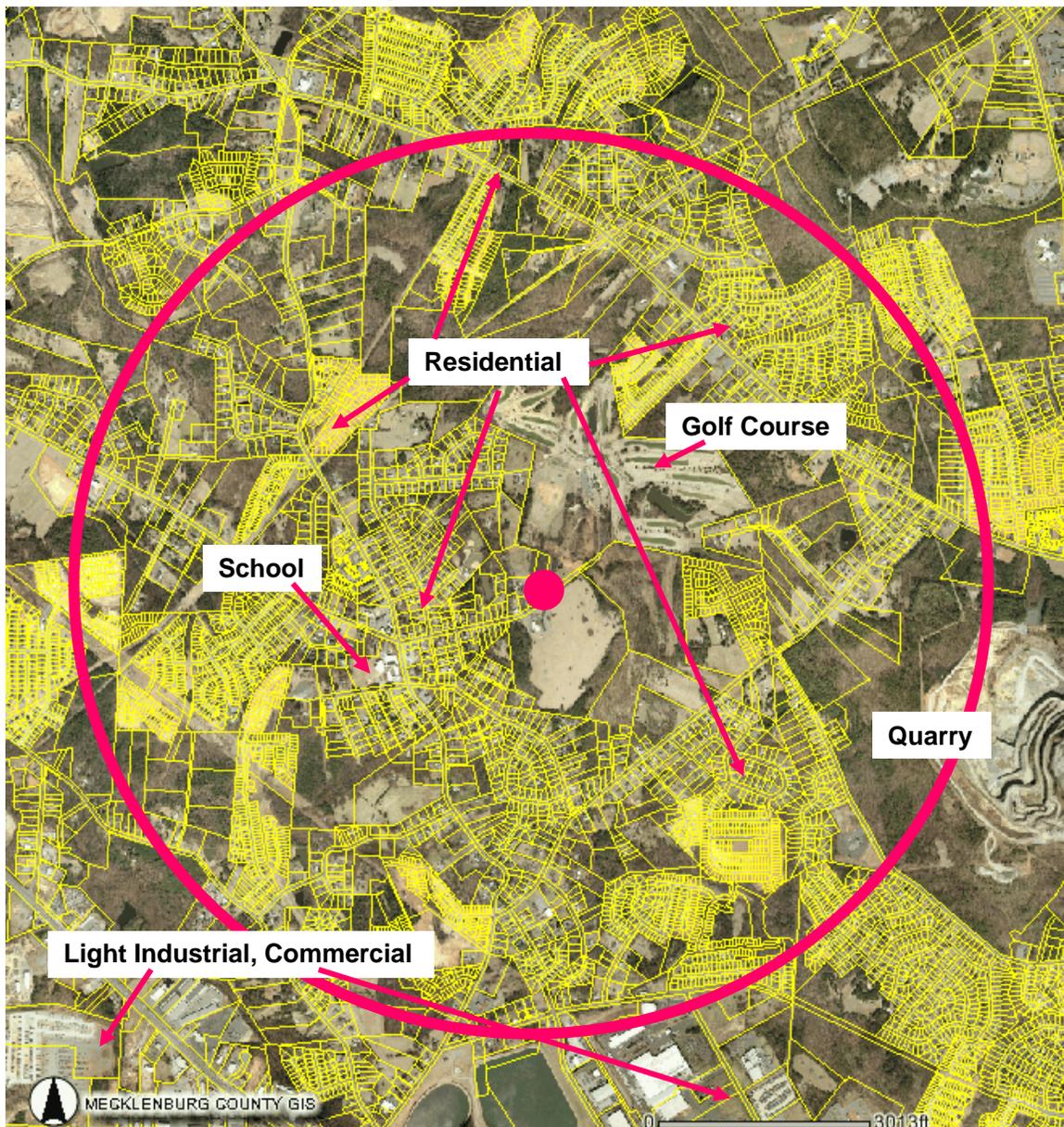


Figure 11. Oakdale aerial photograph with 4 km diameter circle.

(D) Oakdale Site Photographs



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST

V. 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. Watson, John G., Chow, Judith C., DuBois, David, Green, Mark, Frank, Neil, Pitchford, Marc. Guidance for Network Design and Optimum Site Exposure for PM2.5 and PM10. Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC 27711. December 15, 1997.
3. Charlotte Department of Transportation. Traffic Counts 2000-2004. <http://www.charmeck.org/Departments/Transportation/Traffic/Traffic+Counts.htm> . Charlotte, NC. 2004.
4. State of North Carolina, Department of Transportation. Traffic Count Information. http://www.ncdot.org/planning/tpb/traffic_survey/ . 1500 Mail Service Center, Raleigh NC, 27699-1500. 2004.
5. The Map Shop, 1500 E. Morehead Street, Charlotte, NC 28207. Telephone: 704-332-5557.
6. Weinstock, Lewis. Documenting NCore Stations in 2010 Annual Monitoring Plans. E-mail memorandum from EPA, OAQPS, Air Quality Assessment Division, Ambient Air Monitoring Group. April 15, 2009.
7. U.S. EPA, Office of Air Quality Planning and Standards. Quality Assurance Handbook for Air Pollution Measurement Systems Volume IV: Meteorological Measurements (Draft). EPA-454/D-06-001. Research Triangle Park, NC, October 2006.
8. Charlotte-Mecklenburg Site One Economic Development GIS. <http://maps.co.mecklenburg.nc.us/edgis/> , Reports from website – 2010.

Appendix A.

MCAQ AMBIENT AIR MONITORING WORK PLAN FOR NCore MONITORING STATION (Revised to reflect current status 2010)

(A) NCore Plan Overview

In October 2006 the United States Environmental Protection Agency (EPA) issued final amendments to the ambient air monitoring regulations for criteria pollutants. These amendments are codified in 40 CFR parts 53 and 58. The purpose of the amendments was to enhance ambient air quality monitoring to better serve current and future air quality needs. One of the most significant changes in the regulations was the requirement to establish National Core (NCore) multi-pollutant monitoring stations.

(B) NCore Monitoring Objectives

The NCore Network addresses the following monitoring objectives:

- timely reporting of data to the public through AIRNow, air quality forecasting, and other public reporting mechanisms
- support development of emission strategies through air quality model evaluation and other observational methods
- accountability of emission strategy progress through tracking long-term trends of criteria and non-criteria pollutants and their precursors
- support long-term health assessments that contribute to ongoing reviews of the National Ambient Air Quality Standards (NAAQS)
- compliance through establishing non-attainment/attainment areas by comparison with the NAAQS
- support multiple disciplines of scientific research, including; public health, atmospheric and ecological

After an evaluation of the existing network, historical data, census data, meteorology, and topography, MCAQ recommended site 37-119-0041 (Garinger) as a proposed NCore site. The site was approved as an NCore site by the USEPA Office of Air Quality Standards and Planning (OAQPS) on October 30, 2009. The letter approving the site is attached to this document as Appendix B.

(C) NCore Methodology

The NCore site must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, speciated PM_{10-2.5}, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature. Lead (Pb) monitoring is proposed as a new requirement in a pending 'Notice of Proposed Rule'. The 'Notice of Final Rule' for lead is scheduled to be issued mid-2010. Lead monitoring will be conducted per the final rule if funding is available.

The site established at 37-119-0041 is a former National Air Monitoring Station (NAMS) site for ozone and carbon monoxide. Monitoring equipment has been installed at the site

to meet the monitoring requirements for NCore as per 40 CFR 58, Appendix D, §3.b, except for the following parameters: speciated PM_{10-2.5}. Per the EPA memorandum documented in reference 6 of the 2010 Annual Monitoring Network Plan for Mecklenburg County, speciated PM_{10-2.5} monitoring should not be addressed at this time.

Methods for the criteria NCore pollutants are measured using federal reference methods (FRM), federal equivalent methods (FEM), or approved regional methods (ARM), except for the following: continuous PM_{2.5} particle mass. Continuous PM_{2.5} is conducted using an R-P Tapered Element Oscillating Micro-balance (TEOM). The TEOM has been found to be a well-performing method in the MCAQ network. Please see Section III.3. and Section IV.5. for additional information regarding monitoring methods and startup dates.

Quality Assurance procedures shall be implemented in accordance with 40 CFR 58, Appendix A for NCore. MCAQ's current Quality Assurance Project Plan (QAPP) covers criteria pollutants, meteorological measurements, and PM_{2.5} speciation. Trace level instruments (CO, SO₂, NO_y) are currently operating under the MCAQ Quality Assurance Project Plan, except for NO_y. The MCAQ QAPP will be modified to include specific information regarding the trace level instruments and/or a separate QAPP for these instruments will be developed and submitted prior to July 1, 2011. SOPs are already developed or in development for the trace pollutant parameters currently operating at the proposed NCore site (37-119-0041).

(D) NCore Siting Requirements and Criteria

The NCore multi-pollutant sites are sites that measure multiple pollutants in order to provide support to integrated air quality management data needs. NCore sites include both neighborhood and urban scale measurements. Monitoring will be conducted in a selection of metropolitan areas and a limited number of more rural locations. Continuous monitoring methods are to be used at the NCore sites when available and appropriate, as it is important to have data collected over common time periods for integrated analyses. NCore multi-pollutant sites are intended to be long-term sites useful for a variety of applications including air quality trends analyses, model evaluation, and tracking metropolitan area statistics. As such, the NCore sites should be placed away from direct emission sources that could substantially impact the ability to detect area-wide concentrations.

40 CFR Part 58 Appendix D provides design criteria for ambient air monitoring. The monitoring objective for the NCore site is to produce data that represents a fairly large area and therefore the spatial scale of the site is important. The spatial scale defines the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. The scale is determined by the characteristics of the area surrounding the air monitoring site and the site's distance from nearby air pollution sources such as roadways, factories, etc. In the case of urban NCore, the spatial scales to be used are neighborhood and urban. The scale of representativeness for site 37-119-0041 is defined as neighborhood for all parameters. See Section IV.5. for additional information regarding site characteristics at 37-119-0041.

The neighborhood scale defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers in

diameter around the monitoring site. The area around site 37-119-0041 is a mix of commercial, light industrial, institutional and residential land uses. The area is estimated to be more than 50% residential.

The site may be considered representative of many areas in Mecklenburg County. Approximately 1.3% (10552) of the total population (2006 = 827,445) of Mecklenburg County lives within a 1 mile radius (1.6 km) of the site. Approximately 26.4% (218082) of the total population of Mecklenburg County lives within a 5 mile (8 km) radius of the site.

The 4 km diameter circle around the site includes 2 public schools, 1 large institutional retirement center, 1 smaller assisted living center, at least 2 day care centers, a park and recreation facility, commercial land use along the thoroughfares, and a commercial/industrial area just at the northern edge of the 4 km area.

Garinger Aerial Photograph

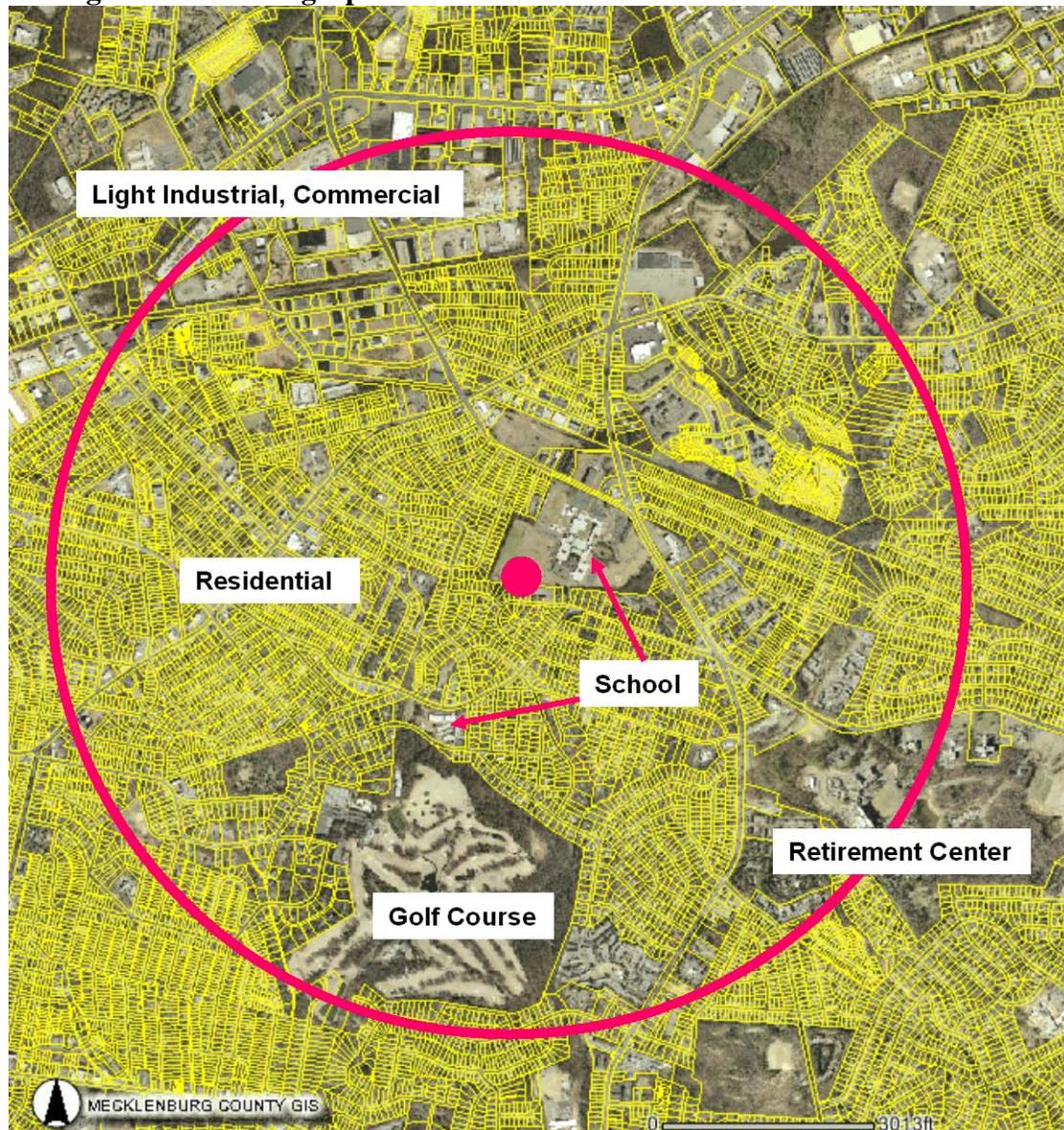


Figure 1. Garinger aerial photograph with 4 km diameter circle.

The proposed NCore site is located 5.6 km (3.5 miles) east-northeast of the central business district (CBD) of uptown Charlotte, North Carolina. Figure 2 depicts a super-imposed image of the 1984 – 1992 Charlotte, NC National Weather Service wind rose placed on a map at the monitoring site location.

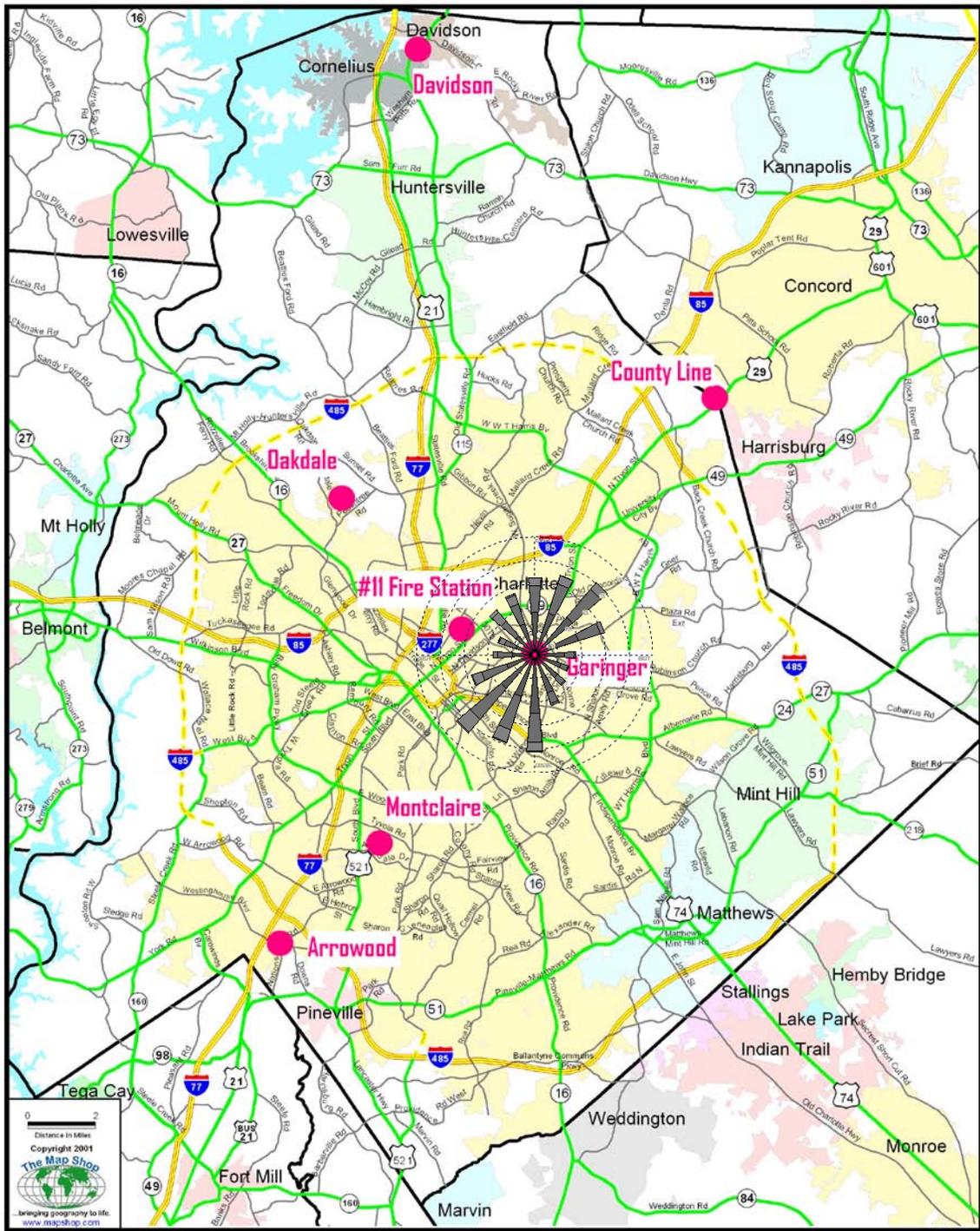


Figure 2.

The placement of the NCore site east-northeast of the urban core provides a neighborhood scale location that is representative of many other areas within and around the urbanized core of Mecklenburg County. This location provides measurement of emissions within the urban area, but also allows for measuring transport and secondary pollutant formation at a site located along a primary summer wind vector from SSW to NNE.

(E) NCore Measurement Status (37-119-0041) and Waiver Requests

The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, speciated PM_{10-2.5}, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

1. Current Status

(a). PM_{2.5}: PM_{2.5} is currently measured using a filter based Thermo/R&P Model 2025 FRM. The sampler operates on a 1/1 sampling schedule. Continuous PM_{2.5} monitoring is being conducted using an R&P TEOM-VSCC-50°C. Probe height for all instruments is 5 meters. The PM_{2.5} equipment is installed, collecting data, and reporting data to AQS. Additionally, the R&P TEOM-VSCC-50°C is reporting data to AirNow.

(b). Speciated PM_{2.5}: Two MetOne SASS samplers are operating at the site. A URG-3000n is also operated at the site for speciation carbon parameters. Probe height is 5 meters. The speciated PM_{2.5} equipment is installed, collecting data, and reporting data to AQS (via RTI).

(c). PM_{10-2.5} Particle Mass: A Thermo/R&P Model 2025 configured for PM₁₀ lo-vol sampling is operating at the site and is being used in conjunction with the PM_{2.5} FRM to determine PM_{10-2.5} at local conditions. The sampler is operating on a 1/3 sampling schedule. A collocated PM_{10-2.5} is sited at site 37-119-0042 to provide a precision measurement for the network. Probe height is 5 meters for the proposed NCore site. The PM_{10-2.5} equipment is installed, collecting data, and reporting data to AQS for PM_{10-2.5} at local conditions and PM₁₀ at local conditions.

(d). Ozone: Ozone instrumentation (Thermo 49i) operates year round at the site. Probe height is 5 meters. The ozone equipment is installed, collecting data, and reporting data to AQS and AirNow.

(e). SO₂: A trace-level SO₂ instrument (Thermo 43c-TLE) operates year round at the site. Probe height is 5 meters. The SO₂ equipment is installed, collecting data, and reporting data to AQS.

(f). CO: A trace-level CO instrument (Teledyne API Model 300EU) operates year round at the site. Probe height is 5 meters. The CO equipment is installed, collecting data, and reporting data to AQS.

(g). NO/NO_y: A trace-level NO/NO_y instrument (42c-y) operates year round at the site. Probe height is 5 meters. A waiver of the 10 meter probe height was applied for in the 2009 NCore Monitoring Plan. The waiver was not granted in the approval letter sent from EPA. Probe height will be increased to ≈ 10 meters prior to January 1, 2011. The NO/NO_y equipment is installed, collecting data, and reporting data to AQS. Additionally, an NO/NO₂/NO_x analyzer operates year round at the site.

(h). Wind Speed / Wind Direction: A WS/WD sensor is operated at the site. Probe height is 10 meters. The wind speed / wind direction equipment is installed, collecting data, and reporting data to AQS.

(i). Relative Humidity / Ambient Temperature: RH/Temperature sensors are operated at the site. Probe height is 3 meters. The Relative Humidity / Ambient Temperature equipment is installed, collecting data, and reporting data to AQS.

2. Waiver Requests Granted

As outlined in the EPA memorandum – “Documenting NCore Stations in 2010 Annual Monitoring Network Plans”, (reference 6 to this plan): Subject to the review of the administrator, MCAQ was granted waivers from the specific minimum requirements for NCore sites wind speed /wind direction obstructions: “EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site’s physical surroundings...In these cases, the requirement for meteorological monitoring can be waived by the Administrator.”⁶

MCAQ has been measuring meteorological parameters at this site for more than 5 years. Site terrain characteristics that influence the wind speed / wind direction sensor are well documented. Obstructions primarily impact winds from the SE. Winds from the west and southwest are also impacted, but to a lesser degree than those from the southeast. Southeasterly winds generally have the lowest frequency of occurrence based on the 1984 – 1992 NWS data. Given this knowledge and taking into consideration the difficulty in Mecklenburg County with meeting the 10x siting criteria in the draft EPA Volume 4 Meteorological guidance document (EPA-454/D-06-001), MCAQ maintains that wind speed / wind direction measurements at this site are adequate when considered with full knowledge of the site terrain. (Please see Figures 3 and 4 below.) MCAQ seeks a waiver of 10x siting criteria to allow continued monitoring of meteorological parameters for wind speed / wind direction at the site.

Garinger High School Air Monitoring Station
AQS ID: 37-119-0041

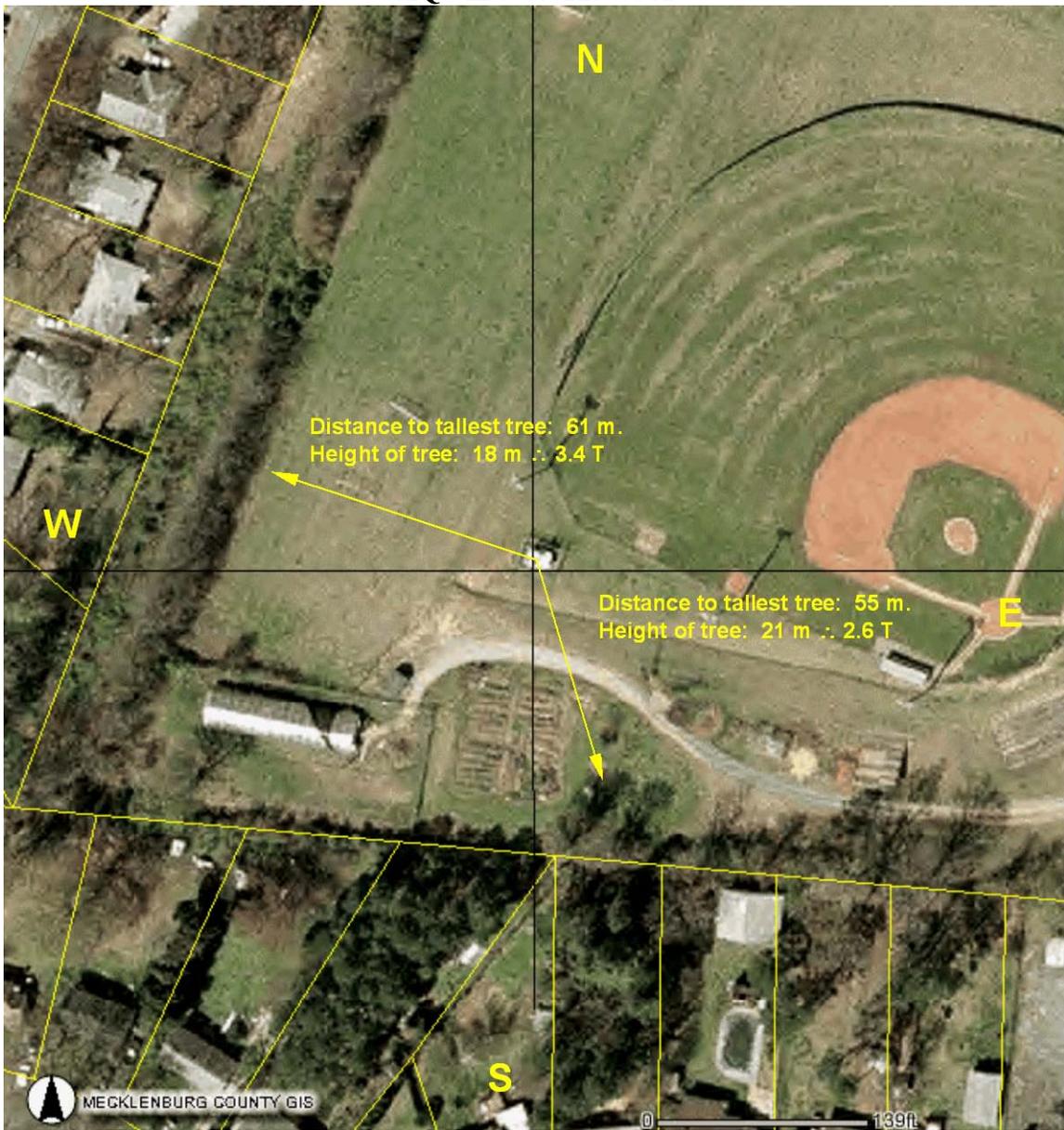


Figure 3. 10 Meter meteorological tower located at center.



Figure 4.

(F) Other NCore Considerations

Site 37-119-0041 is currently configured with an 8’W × 14’L monitoring shelter. The shelter was installed in 1999. Due to the limited interior and roof top space in and on the existing structure, siting for additional monitoring equipment at the site is somewhat limited. Equipment spacing requirements at the site are currently being met. However, MCAQ requests consideration for funding for a larger monitoring shelter for this site to allow flexibility in meeting probe inlet spacing requirements for installation of additional instrumentation in the future.

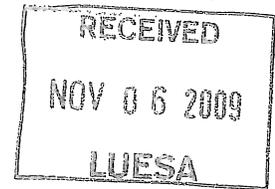
Appendix B. - NCORE Approval Letter:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

COPY

OCT 30 2009



OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Don R. Willard, Deputy Director
Air Quality
Land Use & Environmental Services Agency
Mecklenburg County
700 N. Tryon Street, Suite 205
Charlotte, NC 28202-2236

Dear Mr. Willard:

This letter transmits our approval of Mecklenburg County's proposed NCore station at Garinger High School, AQS# 37-119-0041, 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.

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.

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,

A handwritten signature in cursive script that reads "Richard A. Wayland".

Richard A. Wayland
Director
Air Quality Assessment Division

2 Enclosures

cc: Keith Overcash, NC Dept. of Environmental & Natural Resources
Doug Neeley, EPA Region 4

Enclosure A
Update on Measurements at NCore Stations

The majority of required measurements at NCore stations are either well established or recently improved methods for particles, gases, and meteorology. With minor exceptions, monitoring agencies have identified all of the PM_{2.5}, gas, and meteorological measurements necessary for successful operation of their NCore station. However, PM_{10-2.5} mass methods have only recently become available and PM_{10-2.5} speciation methods are not fully developed. This enclosure summarizes our current position on available methods for operation of PM_{10-2.5} mass and deployment of methods for PM_{10-2.5} speciation.

Measurement of PM_{10-2.5} Mass

Measurement of PM_{10-2.5} mass is **required** and can now be accomplished with one of several recently approved Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) described in the table¹ below. Monitoring agencies should include one of these methods in their next annual monitoring network plan and have the method operational by January 1, 2011. An annual monitoring network plan submitted to a Regional Office next summer does not need to seek EPA Administrator approval of a newly identified PM_{10-2.5} mass FRM or FEM, so long as the NCore station has already been approved.

Manufacturer	Model	Method
BGI, Inc.	PQ200 Sampler Pair	Manual Reference Method: RFPs-1208-173
Thermo-Fisher, Inc.	Model 2000 PM _{10-2.5} Sampler Pair	Manual Reference Method: RFPs-0509-175
Thermo-Fisher, Inc.	Model 2025 PM _{10-2.5} Sequential Air Sampler Pair	Manual Reference Method: RFPs-0509-177
Thermo-Fisher, Inc.	2000-D Dichotomous Air Sampler	Manual Equivalent Method: EQPS-0509-178
Thermo-Fisher, Inc.	2025-D Dichotomous Air Sampler	Manual Equivalent Method: EQPS-0509-180
Met One, Inc.	BAM-1020 PM _{10-2.5} Measurement System	Automated Equivalent Method: EQPM-0709-185

Measurement of PM_{10-2.5} Speciation

Per the advice of the Clean Air Scientific Advisory Committee's (CASAC), Ambient Air Monitoring & Methods Subcommittee (AAMMS)², PM_{10-2.5} speciation is **not** to be implemented at NCore at this time. Our office is working with two monitoring agencies to evaluate options for PM_{10-2.5} speciation methods during a pilot study over the coming year. Also, consistent with the CASAC AAMMS advice, we will be considering what the optimum network design should be once a specified PM_{10-2.5} speciation method is available for routine use. A letter and detailed comments from the subcommittee members is available on the web at: <http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommittees/CASAC>. See: Advisory Reports for fiscal year 2009.

¹. Table of PM_{10-2.5} mass methods is current as of October 2009. For a list of the latest available designated reference and equivalent methods, see the AMTIC web site at: <http://www.epa.gov/ttn/amtic/criteria.html>.
² 2/11/09 Consultation on Ambient Air Monitoring Issues Related to the Coarse Particle Speciation by the Clean Air Scientific Advisory Committee (CASAC) Ambient Air Monitoring & Methods Subcommittee (AAMMS).

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Enclosure B Applicability of AQS Metadata for NCore

This enclosure provides information on the applicability of important metadata when setting up NCore sites, monitor records, and submitting data associated with NCore. This enclosure focuses on key metadata that may be most useful to data users. AQS requirements for metadata are more exhaustive than the fields listed in this enclosure and any required fields will still need to be populated, even if not specified below. For non-required fields, monitoring agencies are encouraged to supply other metadata that may also be useful to data users. Please incorporate this information into data reporting for your approved NCore Station(s).

Site Level:

The structure of the AQS data base requires that a "site" be set up prior to setting up monitor records. A site record in AQS defines information about the location of a monitoring station such as the street address, latitude and longitude; and the AQS State, County, and site ID. Except for a few completely new stations, most monitoring agencies have successfully set up the appropriate site information in AQS. Of the available fields to populate in a Site Record, we are asking for your attention in assuring that the following fields are appropriately populated.

Local Site Name – Although not required, we are asking you to populate this field with a descriptive name for your NCore station. This should be consistent with the site name identified in your NCore plan and may be associated with the site name identified on your own web site or on AIRNow. This should be populated with a name that is different than your 9-digit StateCountySite AQS ID. This will help in communicating your NCore Station with data users not familiar with AQS coding structure. If your agency already uses a code in this field for your own purposes, it is not necessary to provide a more descriptive entry.

A couple of examples of descriptive names provided in NCore plans are "Jefferson Elementary" for a site in Iowa and "Allen Park" for a site in Michigan.

Latitude and Longitude – Ensure the correct "Horizontal Datum" is populated with the coordinates. Monitoring agencies are encouraged to validate these coordinates with commercially available GPS units and/or by reviewing publically available satellite imagery such as on Google™ Earth.

Primary Monitor Periods – For PM_{2.5} as a NAAQS criteria pollutant (parameter code 88101), the monitoring agency must identify which POC is the primary monitor in the "Primary Monitor Periods" screen. This is required to be populated even if there is only one registered POC for parameter code 88101. At this time, no other pollutants use this screen.

Monitor Level:

Monitor records are set up for each measured pollutant or meteorological parameter being reported to AQS. Therefore, there is a many to one relationship between monitor records and a monitoring station. Please update the following fields, as necessary, for each pollutant measurement reporting to AQS from your NCore Station.

Monitor Type – Each monitor operating at an NCore Station will typically have at least two monitor types associated with it.

EPA-OAQPS will be responsible for adding "NCore" as a monitor type for NCore measurements being reported at each approved NCore Station. Note: we will also remove "Proposed NCore," where applicable. For NCore measurements that come on-line and begin reporting after the initial round of NCore monitor type

associations, EPA-OAQPS will periodically review NCore Station data in AQS and add a monitor type of NCore for any remaining required NCore measurements being reported, but not already associated with a monitor type of NCore.

Each monitoring agency is responsible for populating a monitor type that provides the "Administrative Classification" of the monitor. For NCore Stations, this will largely be a monitor type of SLAMS since the majority of NCore Stations are operated by state and local agencies. A smaller number of NCore Stations are operated or coordinated with monitoring partners such as a Tribal Monitoring Program, the National Park Service, or EPA's CASTNET Program. In these cases, a monitor type of "Tribal Monitors," "Non-EPA Federal," or "CASTNET" can be used.

Measurement Scale – We are requesting that you populate this field for each monitor reporting data to AQS. For Urban and Suburban NCore Stations, this will most likely be either Neighborhood Scale or Urban Scale. For Rural NCore Stations, we are expecting the use of Regional Scale.

Monitoring Objective – All Urban and Suburban monitors reporting to AQS should use "Population Exposure" as the monitoring objective. Rural NCore stations should use the most appropriate choice between "Upwind Background," "General Background," "Regional Transport," or "Extreme Downwind." Other Monitoring objectives may apply, but are not expected.

Area Represented – For Urban and Suburban Stations, populate this field with the appropriate code for either the CBSA or CSA, if applicable. For Rural Stations, this field should not be populated.

Sample Frequency – A sample frequency is required to be associated with each of the PM measurements. For filter-based measurements this is typically on a schedule of "every 3rd day." However, some agencies may be operating their PM samplers on a daily schedule. Sample frequency does not need to be loaded for continuous measurements.

Data Level:

A few notes are provided below associated with submitting data records to AQS. Please incorporate these notes into your data reporting to AQS.

PM_{2.5} Continuous Measurements – A technical note on the use of parameter codes for PM_{2.5} continuous methods was issued on June 1, 2006. This technical note is available on the EPA's AMTIC web site at: <http://www.epa.gov/ttn/amtic/datamang.html>. On July 24, 2008, a memo was issued on "Implementing Continuous PM_{2.5} Federal Equivalent Method (FEMs) and Approved Regional Methods (ARMs) in State or Local Air Monitoring Stations (SLAMS) Networks." This memo is available on the same web site listed above.

While monitoring agencies can operate either FEM's, ARM's (if one is approved), or well performing non-FEM/ARM PM_{2.5} continuous monitors, agencies should report their data to either 88101, if it is an approved FEM or ARM, or to 88502, assuming it is a well performing PM_{2.5} continuous method that is not approved as a FEM or ARM. Each NCore Station should have either an FEM/ARM or well performing PM_{2.5} continuous method reporting to AQS so that these data can provide the high temporal resolution expected at NCore Stations for use in AQI reports and other assessments.

Method Code - Each data record includes a 3-digit method code that associates detail on the sampling and analysis method with a piece of data. Of particular note for NCore trace gas measurements of CO, SO₂, and NO/NO_y, monitoring agencies should be utilizing the appropriate method code associated with the trace gas measurements that provides a substantially improved detection limit. Default Method Detection Limits (MDL's) are provided for each commonly used trace gas method in the AQS data base. Monitoring agencies can also submit their own MDL, where applicable. Many, but not all, of the method codes associated with trace gas instruments have a method code in the range between 500 and 600.

Table of Select AQS Metadata associated with NCore

AQS Metadata Field	Location of Metadata	Are Multiple Options Allowed?	Does AQS Require this Field?	Expected Option(s) for NCore	Notes
Local Site Name	Site Level	No	No	We are requesting you identify your site name in AQS	Please use a descriptive name
Latitude	Site Level	No	Yes	8 digits, including 6 past the decimal place with a positive sign indicating above the equator (+xx.xxxxxx)	Ensure the correct "Horizontal Datum" is populated with the coordinates
Longitude	Site Level	No	Yes	9 digits, including 6 past the decimal place with a sign (+xxxx.xxxxxx)	
Primary Monitor Periods	Site Level	No	Yes, but only for 88101	Always populate for PM _{2.5} (parameter code 88101)	
Monitor Type	Monitor Level	Yes	Yes	NCore	EPA-OAQPS will update or add "NCore" as a monitor type for each approved NCore Station
				SLAMS, Tribal Monitors, Non-EPA Federal, or CASTNET	Monitors at each station should also identify one of the Monitor Types on the left
				Other Monitor types such as IMPROVE, PAMS, or Trends Speciation may also apply	
Measurement Scale	Monitor Level	No	No – however, we are requesting you populate this field	Neighborhood Scale 500M to 4KM	Expect one of these for monitors at Urban or Suburban Stations
				Urban Scale 4 KM to 50 KM	Expected for monitors at Rural Stations
				Regional Scale 50 to hundreds KM	
Monitoring Objective	Monitor Level	Yes	Yes	Population Exposure	For monitors at all Urban and Suburban NCore Stations
				Upwind Background, General Background, Regional Transport, or Extreme Downwind	Expect one of these for monitors at Rural NCore Stations
				Other Monitoring Objectives may apply for either Urban or Rural NCore Stations; however, one of the above should be utilized at a minimum	
Area Represented	Monitor Level	Only one type of area (CBSA or CSA) can be listed per objective	No – however, we are requesting you populate this field	CBSA Represented	Urban Stations should use one of the following
				CSA Represented	
Sample Frequency	Monitor Level	No	Required only for PM	Rural Stations should not populate this field Relevant sample frequencies include: 1 Every Day 3 Every 3 rd day	PM monitoring is required at a minimum frequency of one in every 3 rd day