Air Quality Monitoring Group

2011 Annual Monitoring Network Plan Mecklenburg County Air Quality

A Division of the Mecklenburg County
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July 1, 2011

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CERTIFICATION

By the signatures below, Mecklenburg County Air Quality (MCAQ) certifies that the information contained in the "2011 Annual Monitoring Network Plan for Mecklenburg County Air Quality" is complete and accurate, to the best of our knowledge, at the time of submittal to USEPA 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 USEPA Region 4 at that time.

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2011 ANNUAL MONITORING NETWORK PLAN
MECKLENBURG COUNTY AIR QUALITY
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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, North Carolina. 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 unhealthy levels of air pollution.

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 (carbon monoxide - CO, nitrogen dioxide - NO_2, sulfur dioxide - SO_2, particulate matter - PM, lead - Pb, and ozone - O_3) in accordance with USEPA regulatory requirements.

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. *Primary standards* set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, known as "criteria" pollutants. They are listed in Table 1:

National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**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 $\mu g/m^3$ (2)	Rolling 3-Month Average	Same as Primary	
	1.5 $\mu g/m^3$	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb (3)	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour (4)	None	
Particulate Matter (PM_{10})	150 $\mu g/m^3$	24-hour (5)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 $\mu g/m^3$	Annual (6) (Arithmetic Average)	Same as Primary	
	35 $\mu g/m^3$	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)		
	75 ppb (11)	1-hour	None	

(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 100 ppb (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 PM2.5 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.
(11) (a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Table 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 six 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 occasionally, 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: This section provides an overview of the designations, parameters, monitoring methods, and the basis for site selection.

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

IV. Air Monitoring Station Description: In this section each air monitoring station is described in detail. 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/CBSA/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 are 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 $PM_{2.5}$, PM_{10}, O_3, 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]

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 (PM_{10})

All PM_{10} 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:

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

(B) Particulate Matter ($PM_{2.5}$, PM_{10} 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:

Method	Designation Number	Method Code
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:

Method	Designation Number	Method Code
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:

Method	Designation Number	Method Code
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 December 29, 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 and the Agilaire AirVision SQL database located on the 2nd floor of the Hal Marshall County Services Center, 700 North Tryon Street, Suite 205, Charlotte, North Carolina. On a weekly basis the AirVision data are backed up to the Hall Marshall local area network (lan) server. 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

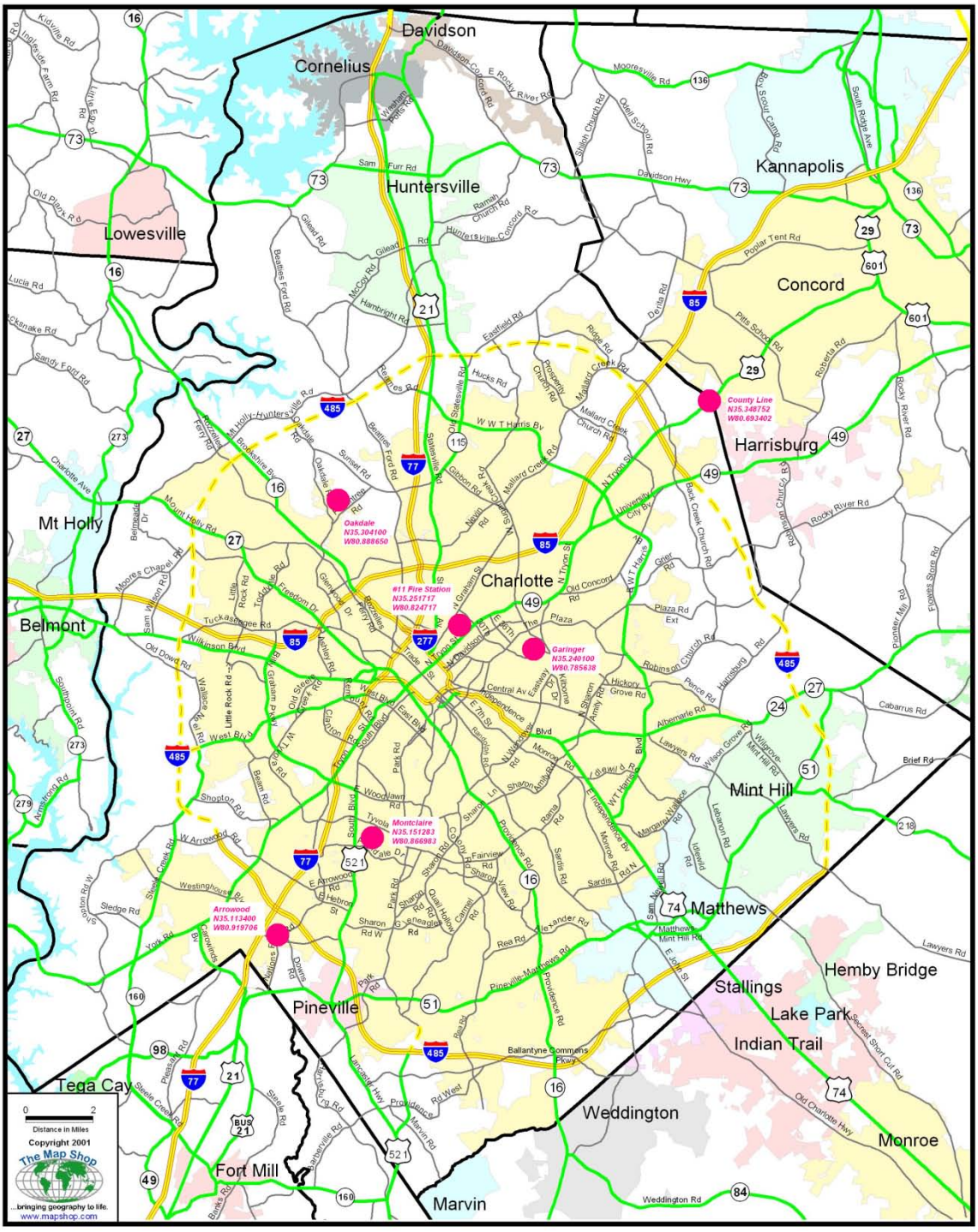
1. Site Table and Criteria Pollutants Monitored

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					
County Line	37-119-1009			X					
Garinger	37-119-0041	X	X	X	12/29 /11	X	X lo-vol	X	X
Montclaire	37-119-0042				12/29 /11	X	X lo-vol		X
Oakdale	37-119-0043					X			

Table 3.

2. Site Map

AIR QUALITY MONITORING STATIONS
MECKLENBURG COUNTY, NC 2011



= 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	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	86101	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-Resultant	MetOne	061	61104	SLAMS NCore
37-119-0041	Wind Speed-Resultant	MetOne	061	61103	SLAMS NCore
37-119-0041	Wind Direction-Scalar	MetOne	061	61101	SLAMS NCore
37-119-0041	Wind Speed-Scalar	MetOne	061	61102	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	86101	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, NCore – National Core, SPM – Special Purpose, NON – Non-regulatory, CSN – Chemical Speciation Network

4. Network Modifications

(A) Monitoring Station Siting Modifications

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 $\mu g/m^3$ to 0.15 $\mu g/m^3$. The new NAAQS requires two types of monitoring: source oriented monitoring (> 0.5 tpy) and population oriented monitoring at NCore sites. 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 emissions threshold. Monitoring is required at the MCAQ NCore site.

MCAQ plans to conduct lead monitoring at station 37-119-0041 (NCore site) to comply with EPA requirements. 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 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 the 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 is scheduled to begin December 29, 2011, if funding is available.

(B) Instrumentation Operation Modifications

PM2.5 Sampling Frequency:

MCAQ is currently evaluating reducing sampling frequency at everyday (1/1) $PM_{2.5}$ FRM sampling sites. Sampling frequency may be reduced to every third day (1/3) within the next 24 months pending further evaluation.

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 28th Street				
Charlotte, NC 28206				
Latitude: N35.251717º		Datum: WGS84		
Longitude: W80.824717º				
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 PM_{10} 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 N35.251717º and longitude W80.824717º. 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 PM_{10} 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 PM_{10} sampler is a SLAMS.

A motor vehicle emissions evacuation device exhaust stack is located 8.8 meters from the PM_{10} 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 PM_{10} 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.

OBJECTIVE AND SPATIAL SCALE

The #11 Fire Station sampling site is representative of particulate concentrations in a mixed industrial, commercial, and residential area. The PM_{10} 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

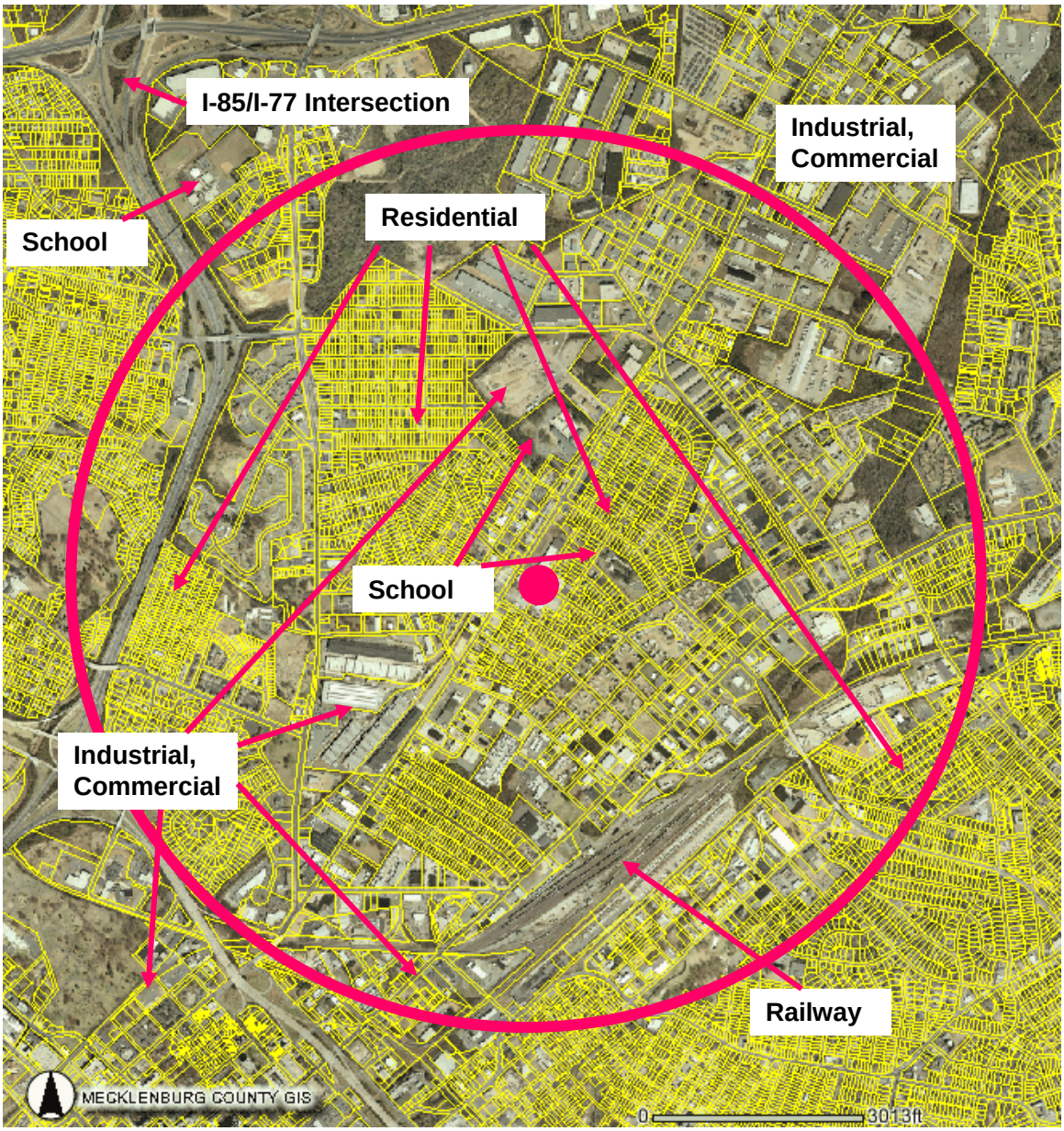


Figure 5. #11 Fire Station aerial photograph with 4 km diameter circle.

(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:	N35.113400º	Datum: WGS84		
Longitude:	W80.919706º			
Elevation:	195 meters			
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
Ozone	UV Photometry	47	5	April 1 – Oct. 31

Date Monitor Established:	Ozone	June 6, 1980	
Date Monitor Established:	PM10	January 1, 1991	
Date Monitor Terminated:	PM10	December 31, 2010	
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. 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 N35.113164º and longitude W80.919532º. 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 inlet is 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. There is unrestricted airflow in at least a 270º 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 monitor is a 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 site complies with the siting requirements of 40CFR58 for criteria air pollutants. 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 site is a neighborhood spatial scale for ozone. 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) Arrowood Aerial Photograph

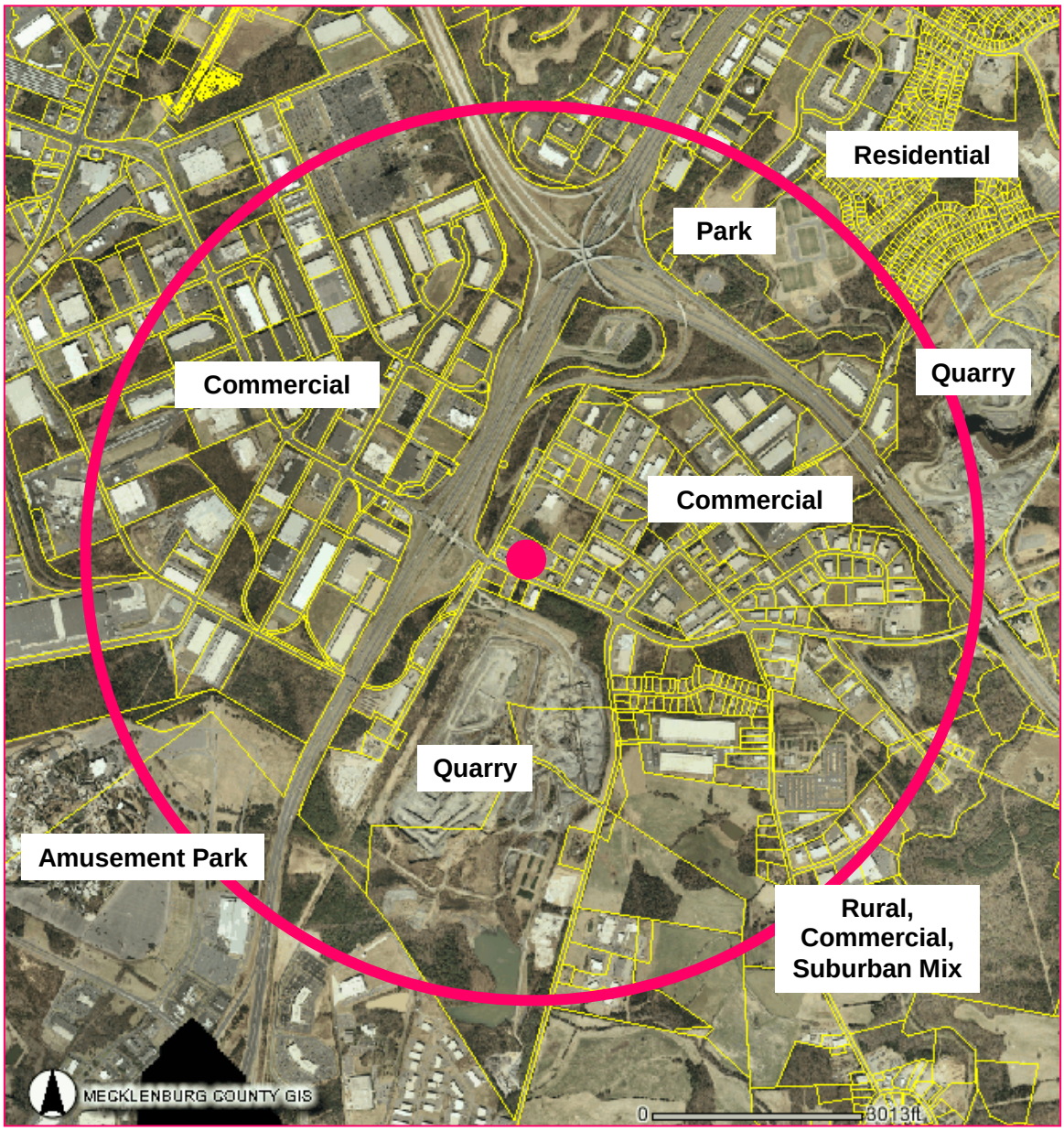


Figure 6. Arrowood aerial photograph with 4 km diameter circle.

(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:	N35.348752º	Datum: WGS84		
Longitude:	W80.693402º			
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 N35.348752º and longitude W80.693402º. 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

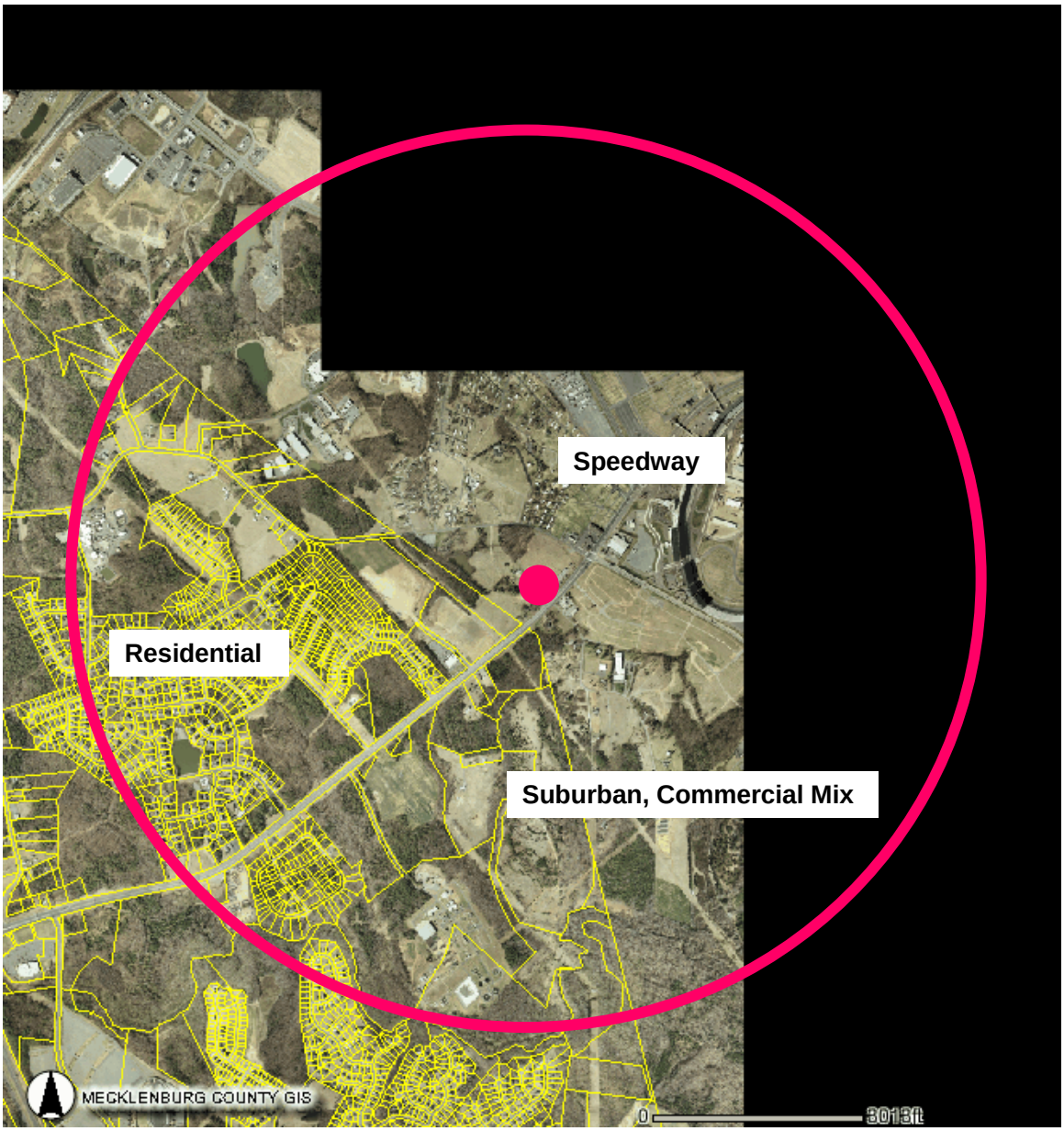


Figure 7. County Line aerial photograph with 4 km diameter circle.

(D) County Line Site Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

4. Garinger

(A) Garinger Site Table

Site Name: Garinger

AQS Site Identification Number:	37-119-0041			
Location:	1130 Eastway Drive			
	Charlotte, NC 28205			
Latitude:	N35.240100º		Datum: WGS84	
Longitude:	W80.785683º			
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	MetOne	61	10	Continuous
Wind Direction	MetOne	61	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:	NOy 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 N35.240100º and longitude W80.785683º. 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 270º 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 PM_{10} 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 SO_2 (<200 ppb, 1/1/2006), and trace-level NO and NOy (<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, NO_2, trace-level SO_2, trace-level NOy, and trace-level CO are SLAMS. The trace-level SO_2, trace-level NOy, and trace-level CO are also NCore. The $PM_{2.5}$-FRM SLAMS monitor is used for NAAQS determination. The SLAMS NO_2 and SO_2 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. 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 was approved 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 NOy is a probe height of 10 meters. The NOy probe inlet is currently mounted at a height of 5 meters. MCAQ plans to re-site the NOy probe to a height of ≈10 meters after the installation of a more robust support structure, which is estimated to be installed prior to January 1, 2012.

A PM_{10} lo-vol sampler was installed at this site on 4/1/2008. The PM_{10} lo-vol sampler is used in tandem with the $PM_{2.5}$ FRM to determine $PM_{10-2.5}$ (lc) aas well as PM_{10} (lc and stp).

Lead monitoring may begin at this site on December 29, 2011 as described in *Section 4. Network Modifications, (A), 1.*, if funded.

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

Additional Monitoring at Garinger High School

Monitoring for urban air toxics (UAT) is conducted at the Garinger High School site. The North Carolina Division of Air Quality (NCDAQ), Toxics Protection Branch (TPB) maintains a Xontech 911 sampling device at the Garinger High School site. MCAQ operates the sampler on a 1/6 day sampling schedule as specified by NCDAQ.

Whole air samples are collected in stainless steel 6 liter- pressurized canisters supplied by NCDAQ. Analysis of samples is conducted by NCDAQ-TPB. Samples are analyzed by NCDAQ using cryogenic pre-concentration gas chromatography with mass spectrometric detection (GC/MS) via the Compendium Method for Toxic Organics 15 (TO-15) for 68 compounds. The list of compounds is shown in Table 10:

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

Table 10.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Garinger ozone, CO, NO_2, SO_2, PM_{10}, 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

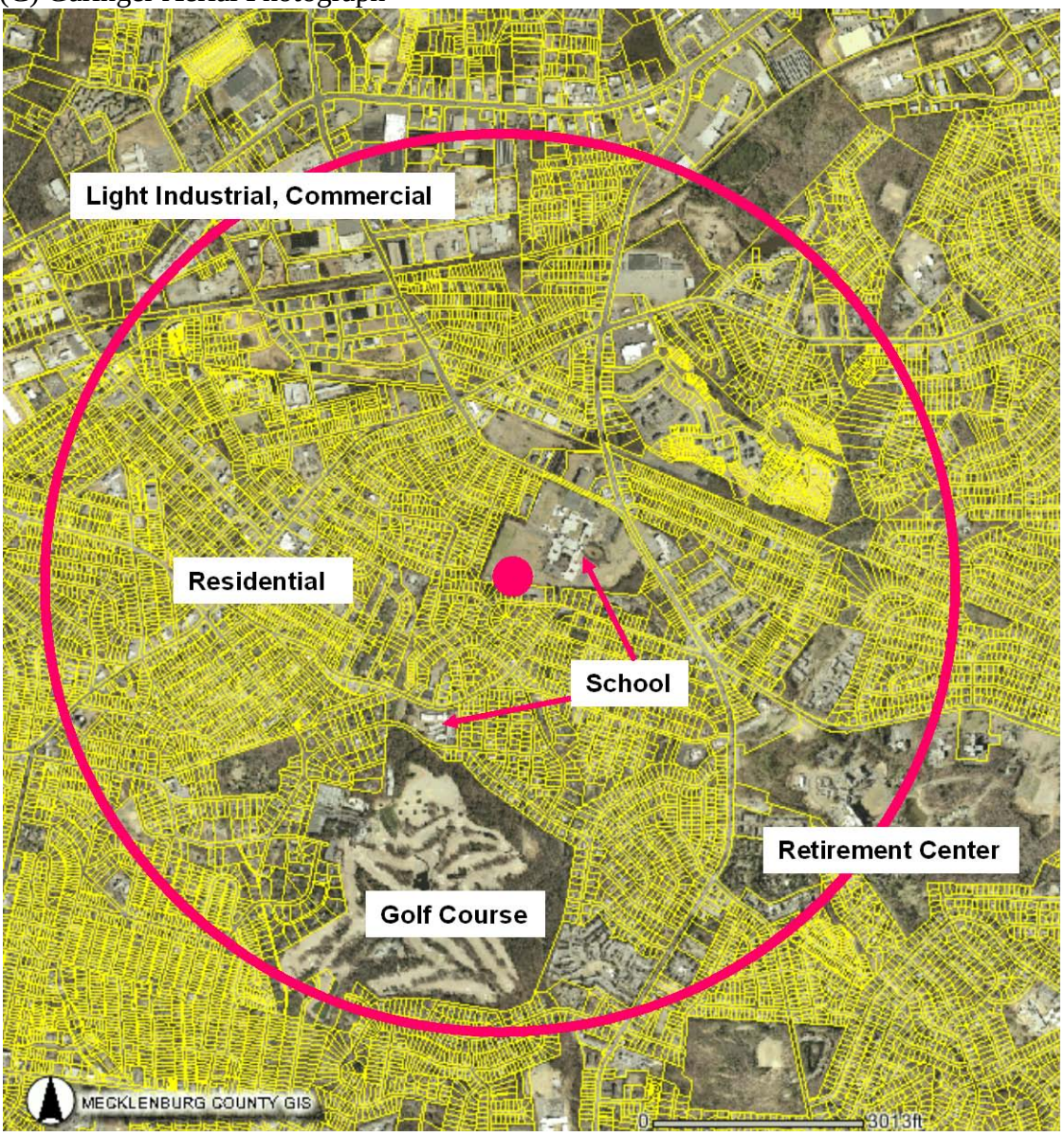


Figure 9. Garinger aerial photograph with 4 km diameter circle.

(D) Garinger Site Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

5. Montclaire

(A) Montclaire Site Table

Site Name:	Montclaire			
AQS Site Identification Number:		37-119-0042		
Location:	1935 Emerywood Drive			
	Charlotte, NC 28210			
Latitude:	N35.151283º	Datum: WGS84		
Longitude:	W80.866983º			
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 11.

(B) Montclaire 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 N35.151283º and longitude W80.866983º. 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. PM_{10} lo-vol samplers (official and collocated) were installed at this site on 7/1/2008. The distance between the official and collocated PM_{10} sampler inlets is 1.4 meters. The PM_{10} lo-vol samplers are used to determine $PM_{10-2.5}$ (lc) and PM_{10} (lc and stp).

Lead monitoring may begin at this site on December 29, 2011 as described in *Section 4. Network Modifications, (A), 1.*, 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 Montclaire 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) Montclaire Aerial Photograph

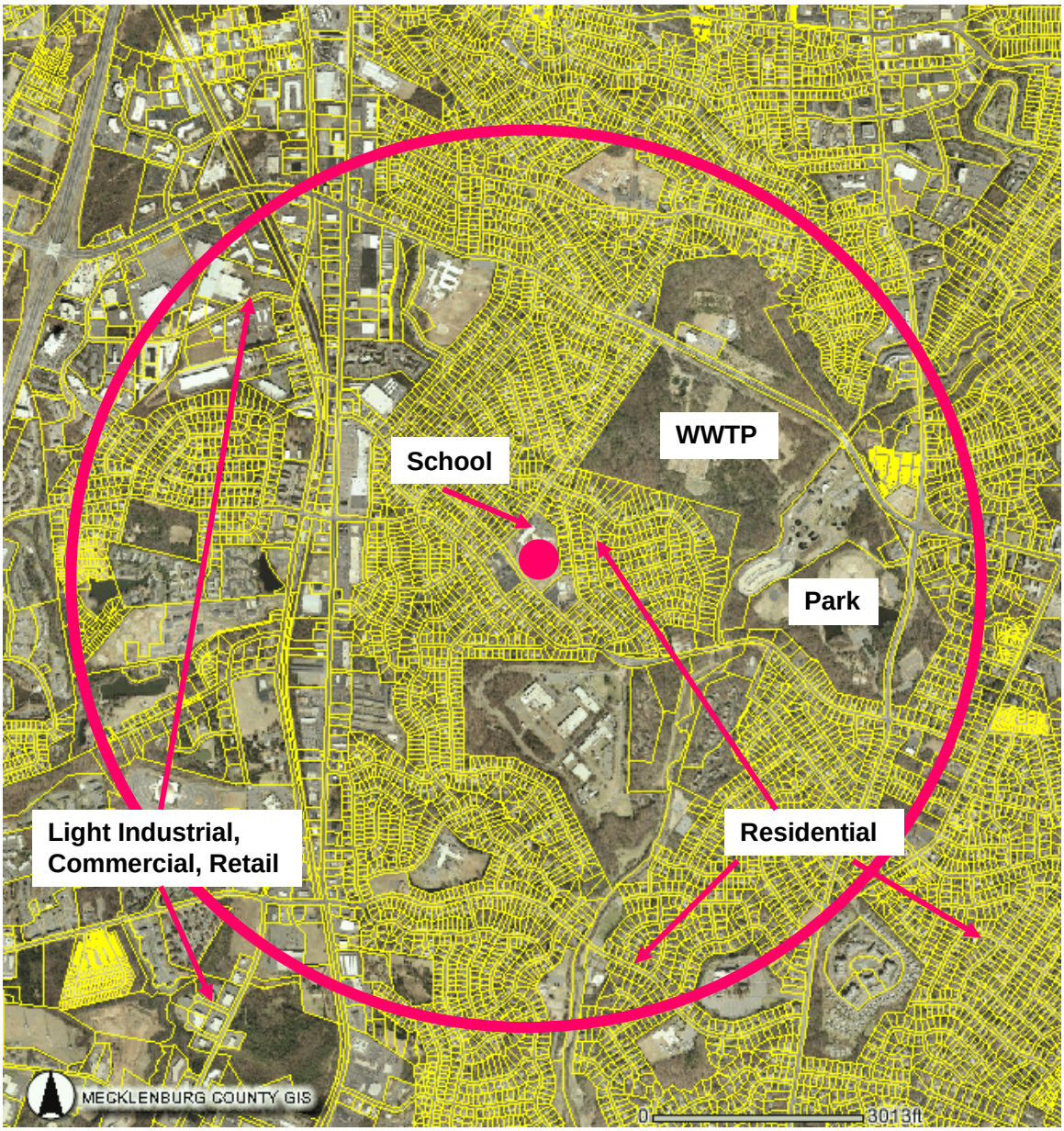


Figure 10. Montclaire aerial photograph with 4 km diameter circle.

(D) Montclaire Site Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

6. Oakdale

(A) Oakdale Site Table

Site Name: Oakdale				
AQS Site Identification Number: 37-119-0043				
Location: 513 Radio Road				
Charlotte, NC 28216				
Latitude: N35.304100º		Datum: WGS84		
Longitude: W80.888650º				
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 12.

(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 N35.304100º and longitude W80.888650º. 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

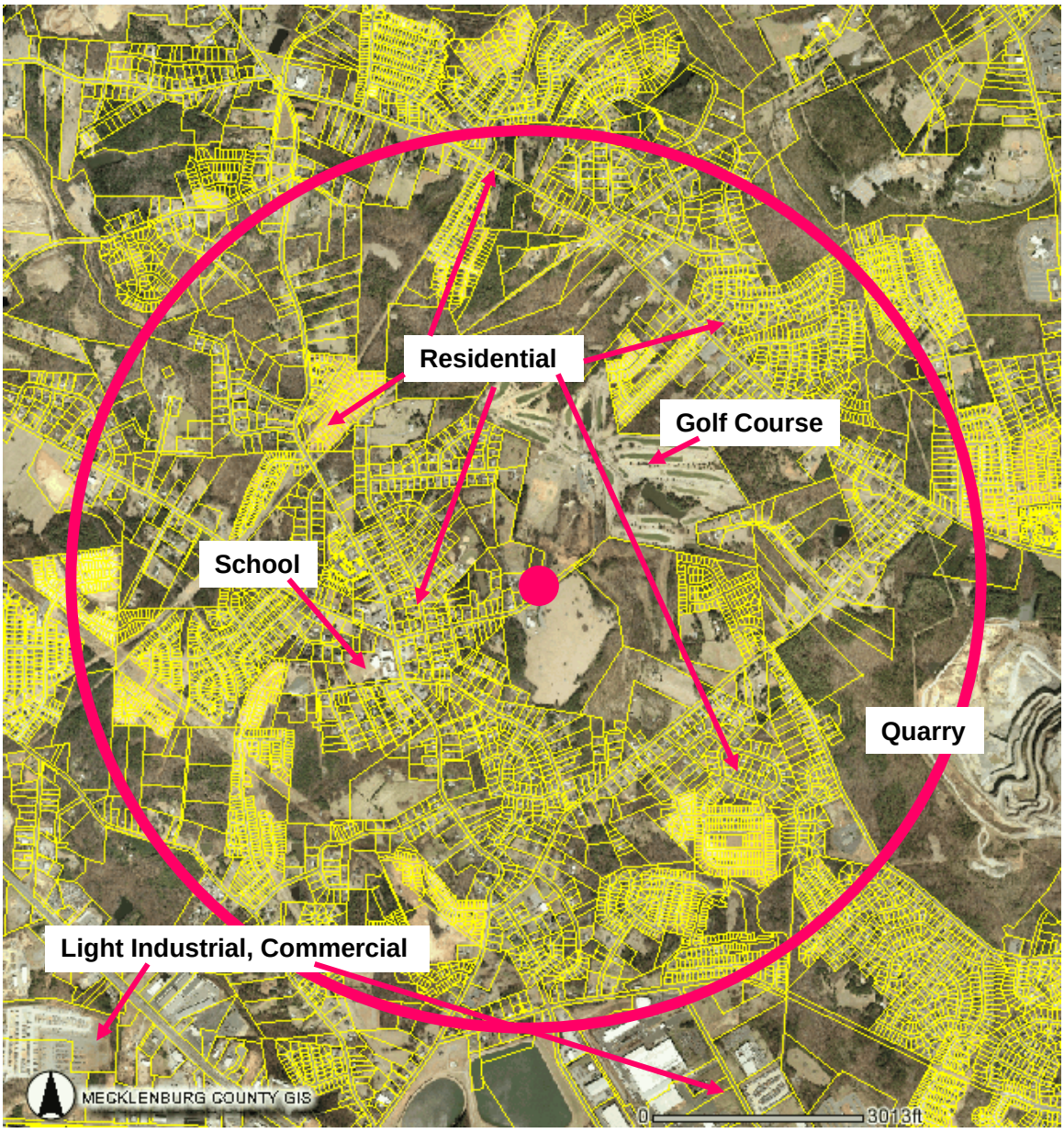


Figure 11. Oakdale aerial photograph with 4 km diameter circle.

(D) Oakdale Site Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

V. REFERENCES

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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.

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VI. APPENDIX A

Monitoring Equipment Replacement Tables

Equipment Evaluation Report 05/11/2011

Number	Location	Equipment	Manufacturer/Model	Parameter	Sampler SN	Condition	Date of Purchase	5-Year Replace Target Date	Scheduled Replace Date
1	3102	Agilaire Claire System	CLAIRE System		3V59CD1	Good	07/07	07/12	2012
2	3102	AQI CLAIRE Computer	Optiplex 745			Good	04/08	03/13	2012
3	3115	Datalogger	ESC 8832		A0409	Good	10/03	10/08	2014
4	3115	Ozone Analyzer - 49c	Therm Environmental	44201-1	432209351	Good	09/04	08/09	NA
5	3115	Ozone Analyzer PS	Therm Environmental		432209352	Good	09/04	08/09	2012
6	3115	Ozone Analyzer PS	TAPI 401X		374	Good	02/05	01/10	2011
7	3115	Ozone Analyzer Thermo	Therm Environmental		49i-PS-0734726810	Good	08/07	08/12	2014
8	37-119-0041	PM2.5 FRM	R&P/2025	88101-1	2025A204679807	Poor	10/98	09/03	2010
9	3115	Voltage Calibrator	Transcat		9733019	Good	08/07	08/12	NA
10	3115	Zero Air System	TAPI 701		1757	Good	03/05	02/10	2013
11	3128	Datalogger	ESC 8832		A0304	Good	03/03	03/08	2014
12	37-119-0003	PM-10	IP-10	81102-1	54176	Good	1991		NA
13	37-119-0003	PM-10	IP-10	81102-2	54174	Good	1991		NA
14	Air Lab	PM2.5 FRM	R&P/2025	Spare	2025A204769807	Poor	10/98	09/03	NA
15	37-119-0042	PM2.5 FRM, Coll	R&P/2025	88101-2	2025A202869805	Poor	10/98	09/03	2013
16	37-119-0041	CO	Therm Environmental		48C-327402211	Good	10/03	10/08	NA
17	37-119-0041	Shelter	EKTO		3088-1	Poor	05/99	04/04	2011
18	37-119-0041	Datalogger	ESC 8816		3656	Good	10/00	09/05	2014
19	37-119-0041	SASS	MetOne	88502	Y4594	Good	10/00	09/05	2011
20	37-119-0041	Outdoor Enclosure PM2.5	EKTO		3278-7	Good	11/01	10/06	NA
22	37-119-0041	NOx	Therm Environmental	42602-1	42C-70033-364	Good	11/01	10/06	2012
23	37-119-0041	TEOM	R & P	88501-3	140ab244570302	Good	11/01	10/06	2012
24	37-119-0042	Datalogger	ESC 8832		A0064	Good	03/02	03/07	2014

Number	Location	Equipment	Manufacturer/Model	Parameter	Sampler SN	Condition	Date of Purchase	5-Year Replace Target Date	Scheduled Replace Date
25	37-119-0041	Ozone Analyzer PS	Therm Environmental		49CPS-73995-375	Good	02/02	02/07	2012
26	37-119-0041	Ozone Analyzer Thermo	Therm Environmental		49i-0728225131	Good	07/07	07/12	2014
27	3115	Multi-gas Calibrator	Environics 6103		3170	Good	10/03	09/08	2011
28	37-119-0042	PMc, PM10 off	R&P/2025	81102-1, 86502-1, 85101-1	2025B217200408	Good	10/04	10/09	2012
29	37-119-0042	Outdoor Enclosure PM2.5	EKTO		3275-7	Good	11/04	10/09	2012
30	37-119-0041	SASS	MetOne	88502	D7162	Good	11/04	10/09	2014
31	37-119-0042	TEOM	R & P	88501-3	140ab252890408	Good	11/04	10/09	2014
32	37-119-0041	Datalogger	ESC 8832		A0896	Good	01/05	12/09	2014
33	37-119-0041	CO trace	Teledyne - API	42101-3	300EU-0068	Good	03/05	02/10	2011
34	37-119-0041	NOy	Therm Environmental	42600-2	42C-Y-0518112307	Good	07/05	06/10	2011
35	37-119-0041	SO2	Therm Environmental	42401-1	43c-tle-0518112303	Good	07/05	06/10	2011
36	37-119-0041	Thermo 146i Calibrator	Therm Environmental		717821846	Good	12/06	12/11	2012
37	Love	Computer	Optiplex 745		DV59CD1	Good	07/07	06/12	2011
38	37-119-0042	PMc,PM10 Coll	R&P/2025	81102-2, 86502-2, 85101-2	2025B221720804	Good	07/07	07/12	2013
39	37-119-0041	BAM 1020	MetOne	88501-4	H1935	Good	03/08	02/13	2016
40	37-119-0041	Multi-gas Calibrator	Environics 6100		4202	Good	04/08	03/13	2013
41	37-119-0041	PMc, PM10	R&P/2025	81102-1, 86502-1, 85101-1	2025B219590706	Good	05/08	05/13	2015
42	37-119-0041	Zero Air System	TAPI M701H		2809	Good	09/08	08/13	2014
43	37-119-0041	Computer	Optiplex 755		JSVBGH1	Good	09/08	08/13	2011
44	37-119-1001	PM-10	IP-10	81102-1	54175	Good	04/00		NA
45	37-119-1005	Computer	GX620		7G9JG81	Poor	09/05	08/10	2011
46	37-119-1005	Datalogger	ESC 8832		A2333K	Good	07/07	07/12	2014

Number	Location	Equipment	Manufacturer/Model	Parameter	Sampler SN	Condition	Date of Purchase	5-Year Replace Target Date	Scheduled Replace Date
47	37-119-1005	Ozone Analyzer	Therm Environmental	44201-1	49i-0636319877	Good	12/06	12/11	2012
48	37-119-1005	Ozone Analyzer PS	Therm Environmental		49CPS-73996-375	Good	02/02	02/07	2011
49	37-119-1005	PM-10	IP-10	81102-1	97105	Good	03/00	03/05	NA
50	37-119-1005	Shelter	EKTO		2958-1	Good	03/97	02/02	2016
51	37-119-1005	Zero Air System	TAPI 701H		3033	Good	09/08	09/13	2014
52	37-119-1009	Computer	Dell 330		F77BV01	Good	11/08	10/13	2011
53	37-119-1009	Datalogger	ESC 8832		A0160	Good	10/02	10/07	2014
54	37-119-1009	Ozone Analyzer	Therm Environmental	44201-1	49i-0636319876	Good	09/05	08/10	2012
55	37-119-1009	Ozone Analyzer PS	Therm Environmental		49CPS-73997-375	Good	02/02	02/07	2012
56	37-119-1009	Shelter	EKTO		2475-3	Poor	12/91	11/96	2011
57	37-119-1009	Zero Air System	TAPI 701H		3035	Good	09/08	09/13	2014
58	Central	Central Computer	Dell Optiplex 755		2TVBGH1	Good	09/08	08/13	2011
59	Claire	Central Computer	Dell Optiplex 755		GSVBGH1	Good	11/08	10/13	2012
60	Digitrend	Central Computer	Dell Optiplex 755		HSVBGH1	Good	09/08	08/13	2011
61	Francis	Computer	Optiplex 760		39KHKK1	Good	07/09	06/14	2012
62	Francis	Laptop Computer	Dell D630		B62GFD1	Good	08/07	07/12	2013
63	Hollenbeck	Computer	Optiplex 760		49KHKK1	Good	07/09	06/14	2012
64	Hollenbeck	Laptop Computer	Dell D630		DZ09GH1	Good	09/08	08/13	2013
65	Hord	Laptop Computer	Dell D630		8019GH1	Good	09/08	08/13	2013
66	Love	Laptop Computer	Dell D620		3JQ2PC1	Good	03/07	02/12	2013
67	Lab	Air Compressor	Junair		546919	Good	04/04	03/09	2015
68	Lab	Central Software	ESC Edas		V5.52	Good	07/05	06/10	2010
69	Lab	Filter Weighing Balance			20902085	Good	1992	06/10	2012
74	37-119-0041	Speciation	URG 3000n		3N-B0428	Good	02/2009	02/14	2014
75	37-119-0041	Meteorological Equipment			Various	NA	Various	NA	NA
76	37-119-0042	Laptop	Dell		5FP1X41	Good			2011

Number	Location	Equipment	Manufacturer/Model	Parameter	Sampler SN	Condition	Date of Purchase	5-Year Replace Target Date	Scheduled Replace Date
79	3106	Computer	Optiplex 760		59KHHKK1	Good	07/09	06/14	2012
80	3106	Laptop Computer	Dell D630		6119GH1	Good	09/08	08/13	2013
81	37-119-0042	PM2.5 FRM	R&P/2025	88101-1	2025A202879805	Poor	10/98	09/03	2011
82	37-119-0043	PM2.5 FRM	Thermo 2025	88101	2025B217230804	Good	10/04	10/09	2012
83	Air Lab	PM2.5 FRM	Thermo 2025	88101	2025B226221002	Good	03/10	02/15	2016
84	Lab	Zero Air Pump	KNF		UN035.1.2ANP	Good	01/10	01/15	2016
85	Lab	Flow Measurement Device	BGI Tetra Cal		000441	Good	01/08	01/13	2014
86	Lab	Flow Measurement Device	BGI Tetra Cal		000345	Good	08/07	07/12	2014
87	Lab	Flow Measurement Device	BGI Tetra Cal		000365	Good	02/09	01/14	2014
88	Lab	Flow Measurement Device	BGI Delta Cal		000078	Good	05/01	04/06	2014
89	Lab	Flow Measurement Device	BGI Delta Cal		000036	Good	01/01	12/05	2014
90	Lab	Temperature Calibrator	Hart Scientific		7102-A32653	Good	02/03	01/08	NA
91	Lab	Pressure Calibrator	Druck DPI-740		7401000	Good	02/01	01/06	2011
92	Lab	Pressure Calibrator	Druck DPI-740		74001098	Good	06/01	05/06	2012
93	Lab	Pressure Calibrator	Druck DPI-740		74001908	Good	08/04	07/09	2015
94	Lab	Zero Air System	TAPI M701H		98	Good	10/11	10/16	2017

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** FS#11 **AQS#:** 37-119-0003
Street Address: 620 West 28th St **City:** Charlotte

Exact Longitude: W80 49' 29" **Exact Latitude:** N35 15' 6"

Parameters: ☐ **PM2.5** ☐ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☒ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☐ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☐Highest Concentration-	☐ Micro-	☒SLAMS-
☒Population Exposure-	☐ Middle-	☐Proposed NCore
☐Source Oriented-	☒Neighborhood-	☐SPM -
☐Background-	☐ Urban-	☐SPM/AQI-
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☒ **N/A** ☐**PM2.5** ☐**PM25cont** ☐**PM10cont** ☐**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☐**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐**Yes** ☐**NO** ☐**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐**Ye s** ☐**NO** ☐**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☐**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☐**NO**
☐**N/A** ☒**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☒**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☒**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☒**Yes** ☐**NO** ☐**N/A**
☒**N/A** ☐**SO2** ☐**NOx** ☐**NOy** ☐**O3** ☐**NH3** ☐**HC** ☐**CO** (not micro)	Probe Height 3-15m?	☐**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☐**Yes** ☐**NO**

Site Name: FS#11 **AQS#:** 37-119-0003

☒N/A ☐CO micro only	Probe Height 2.5-3.5? Distance form horizontal and/vertical supporting structure >1m? Distance to nearest intersection >10 m? Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☐O3 ☐NH3 ☐HC ☐PM2.5 FRM ☐PM25cont ☐Pm25 spec ☐PM25 cont speciated ☒PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line? Probe >10 m from the nearest tree drip line if tree acts as an obstruction? Distance from probe (m)_____ Height of tree (m)_____ Distance between probe and drip line of water tower (m)_____	☒Yes ☐NO ☐Yes ☐NO ☒ NA ☒N/A
ALL Parameters	Are there any obstacles to air flow? Identify obstacle_____ Distance from probe (m) _____ Direction _____ Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☒NO ☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 25 Direction SW Name of nearest road Bancroft ADT 300 Year 2001 Comments: _____ Distance from probe to nearest railroad (m) 211 Direction NW ☐NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. Motor vehicle exhaust capture device vents 8.8 meters from PM10 inlet. Operates intermittently. Device exhausts tailpipe emissions from garage when vehicles are started in garage.	

Site Name: FS#11 **AQS#:** 37-119-0003

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Hi Volume PM10 Collocated Site

Reviewer: Suzanne Hall **Date:** 04/08/14

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** Garinger **AQS#:** 37-119-0041
Street Address: 1130 Eastway Dr **City:** Charlotte

Exact Longitude: W080° 46' 59" **Exact Latitude:** N35° 14' 28"

Parameters: ☒ **PM2.5** ☒ **PM2.5 Cont** ☒ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☒ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☒ **SO2** ☒ **O3** ☒ **CO** ☒ **NOy** ☒ **NOx**
☒ **HSCO** ☒ **HC** ☐ **Pb** ☒ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☒Highest Concentration- O3	☐ Micro-	☒SLAMS- PM25 FRM, PM10 FRM, SO2, O3, CO, NOy, NOx, HSCO, Met, PM2.5 Speciation, PM2.5 cont
☒Population Exposure- PM25,CO	☐ Middle-	☒Proposed NCore- SO2, NOy, HSCO
☐Source Oriented-	☒Neighborhood- ALL	☒SPM – HC
☐Background-	☐ Urban-	☐SPM/AQI
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☐ **N/A** ☒**PM2.5** ☒**PM25cont** ☐**PM10cont** ☒**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☒**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐**Yes** ☐**NO** ☒**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐**Ye s** ☐**NO** ☒**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☒**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☒**NO**
☐**N/A** ☒**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☒**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☒**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☐**Yes** ☐**NO** ☒**N/A**
☐**N/A** ☒**SO2** ☒**NOx** ☒**NOy** ☒**O3** ☐**NH3** ☒**HC** ☒**CO** (not micro)	Probe Height 3-15m?	☒**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☒**Yes** ☐**NO**

Site Name: Garinger **AQS#:** 37-119-0041

☒N/A ☐CO micro only	Probe Height 2.5-3.5?	☐Yes ☐NO
	Distance form horizontal and/vertical supporting structure >1m?	☐Yes ☐NO
	Distance to nearest intersection >10 m?	☐Yes ☐NO
	Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO
☐N/A ☒SO2 ☒NOx ☒NOy ☒O3 ☐NH3 ☒HC ☒PM2.5 FRM ☒PM25cont ☒Pm25 spec ☐PM25 cont speciated ☒PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line?	☒Yes ☐NO
	Probe >10 m from the nearest tree drip line if tree acts as an obstruction?	☐Yes ☐NO ☒ NA
	Distance from probe (m)_____ Height of tree (m)_____	
	Distance between probe and drip line of water tower (m)_____	☒N/A
ALL Parameters	Are there any obstacles to air flow?	☐Yes ☒NO
	Identify obstacle_____ Distance from probe (m) _____ Direction _____	
	Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 298 Direction SE Name of nearest road Shamrock Dr ADT 9400 Year 2010 Comments: Sugar Creek Rd. 15000 (2008) 452m Distance from probe to nearest railroad track (m) *645* Direction NE ☐NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: Garinger **AQS#:** 37-119-0041

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Add BAM-1020 PM2.5 01/09

Reviewer: Suzanne Hale **Date:** 04/08/11

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** Montclaire **AQS#:** 37-119-0042
Street Address: 1935 Emerywood Dr **City:** Charlotte

Exact Longitude: W080 52' 1" **Exact Latitude:** N 35 9' 5"

Parameters: ☒ **PM2.5** ☒ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☒ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☐ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☐Highest Concentration-	☐ Micro-	☒SLAMS- PM2.5, PM10, PM2.5 Cont.
☒Population Exposure- All	☐ Middle-	☐Proposed NCore-
☐Source Oriented-	☒Neighborhood- All	☐SPM -
☐Background-	☐ Urban-	☐SPM/AQI-
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☐ **N/A** ☒**PM2.5** ☒**PM25cont** ☐**PM10cont** ☐**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☒**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☒**Yes** ☐**NO** ☐**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☒**Ye s** ☐**NO** ☐**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☒**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☒**NO**
☐**N/A** ☒**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☒**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☒**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☒**Yes** ☐**NO** ☐**N/A**
☒**N/A** ☐**SO2** ☐**NOx** ☐**NOy** ☐**O3** ☐**NH3** ☐**HC** ☐**CO** (not micro)	Probe Height 3-15m?	☐**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☐**Yes** ☐**NO**

Site Name: Montclaire **AQS#:** 37-119-0042

☒N/A ☐CO micro only	Probe Height 2.5-3.5?	☐Yes ☐NO
	Distance form horizontal and/vertical supporting structure >1m?	☐Yes ☐NO
	Distance to nearest intersection >10 m?	☐Yes ☐NO
	Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☐O3 ☐NH3 ☐HC ☒PM2.5 FRM ☒PM25cont ☐Pm25 spec ☐PM25 cont speciated ☒PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line?	☒Yes ☐NO
	Probe >10 m from the nearest tree drip line if tree acts as an obstruction?	☐Yes ☐NO ☒NA
	Distance from probe (m)_____ Height of tree (m)_____	
	Distance between probe and drip line of water tower (m)_____	☒N/A
ALL Parameters	Are there any obstacles to air flow?	☐Yes ☒NO
	Identify obstacle_____ Distance from probe (m) _____ Direction _____	
	Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 70 Direction S Name of nearest road Emerywood Dr ADT 3600 Year 2007 Comments: _____ Distance from probe to nearest railroad (m) 953 Direction NW ☐NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: Montclaire **AQS#:** 37-119-0042

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Added LoVol PM10 (2025) and collocated LoVol (2025) PM10 on 07/02/08.

Reviewer: Suzanne Hall **Date:** 04/08/11

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** Oakdale **AQS#:** 37-119-0043
Street Address: 513 Radio Road **City:** Charlotte

Exact Longitude: W080 53' 15" **Exact Latitude:** N35 18' 15"

Parameters: ☒ **PM2.5** ☐ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☐ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☐ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☒Highest Concentration-	☐ Micro-	☒SLAMS- PM2.5
☒Population Exposure-	☐ Middle-	☐Proposed NCore-
☐Source Oriented-	☒Neighborhood-	☐SPM -
☐Background-	☐ Urban-	☐SPM/AQI-
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☐ **N/A** ☒**PM2.5** ☐**PM25cont** ☐**PM10cont** ☐**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☒**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐**Yes** ☐**NO** ☒**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐**Ye s** ☐**NO** ☒**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☒**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☒**NO**
☒**N/A** ☐**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☐**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☐**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☐**Yes** ☐**NO** ☐**N/A**
☒**N/A** ☐**SO2** ☐**NOx** ☐**NOy** ☐**O3** ☐**NH3** ☐**HC** ☐**CO** (not micro)	Probe Height 3-15m?	☐**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☐**Yes** ☐**NO**

Site Name: Oakdale **AQS#:** 37-119-0043

☒N/A ☐CO micro only	Probe Height 2.5-3.5?	☐Yes ☐NO
	Distance form horizontal and/vertical supporting structure >1m?	☐Yes ☐NO
	Distance to nearest intersection >10 m?	☐Yes ☐NO
	Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☐O3 ☐NH3 ☐HC ☒PM2.5 FRM ☐PM25cont ☐Pm25 spec ☐PM25 cont speciated ☐PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line?	☒Yes ☐NO
	Probe >10 m from the nearest tree drip line if tree acts as an obstruction?	☐Yes ☐NO ☒ NA
	Distance from probe (m)_____ Height of tree (m)_____	
	Distance between probe and drip line of water tower (m)_____	☒N/A
ALL Parameters	Are there any obstacles to air flow?	☐Yes ☒NO
	Identify obstacle_____ Distance from probe (m) _____ Direction _____	
	Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 36 Direction SE Name of nearest road Radio Road ADT _____ Year _____ Comments: < 1000, estimate Distance from probe to nearest railroad track (m) _____Direction__☒NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: Oakdale **AQS#:** 37-119-0043

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Reviewer: Suzanne Hollobee **Date:** 04/08/11

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** Davidson **AQS#:** 37-119-1001
Street Address: 301 W. Walnut St **City:** Davidson

Exact Longitude: W080 51' 10" **Exact Latitude:** N 35 29' 54"

Parameters: ☐ **PM2.5** ☐ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☒ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☐ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☐ Highest Concentration-	☐ Micro-	☒ SLAMS- PM10
☒ Population Exposure-	☐ Middle-	☐ Proposed NCore-
☐ Source Oriented-	☒ Neighborhood-	☐ SPM -
☐ Background-	☐ Urban-	☐ SPM/OPN/AQI-
☐ Transport-	☐ Regional-	

Answer All Applicable Questions

☒ **N/A** ☐ **PM2.5** ☐ **PM25cont** ☐ **PM10cont** ☐ **PM25spec** ☐ **PM25 cont speciated**	Probe height 2-15m?	☐ **Yes** ☐ **NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐ **Yes** ☐ **NO** ☐ **N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐ **Ye s** ☐ **NO** ☐ **N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐ **Yes** ☐ **NO** ☐ **N/A**
	Near electrical substation/high voltage power lines?	☐ **Yes** ☐ **NO**
☐ **N/A** ☒ **PM10** ☐ **CMB** ☐ **TSP**	Probe Height 2-15m?	☒ **Yes** ☐ **NO**
	Distance from horizontal supporting structure >2m?	☒ **Yes** ☐ **NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☐ **Yes** ☐ **NO** ☒ **N/A**
☒ **N/A** ☐ **SO2** ☐ **NOx** ☐ **NOy** ☐ **O3** ☐ **NH3** ☐ **HC** ☐ **CO** (not micro)	Probe Height 3-15m?	☐ **Yes** ☐ **NO**
	Distance form horizontal and/vertical supporting structure >1m?	☐ **Yes** ☐ **NO**

Site Name: Davidson **AQS#:** 37-119-1001

☒N/A ☐CO micro only	Probe Height 2.5-3.5?	☐Yes ☐NO
	Distance form horizontal and/vertical supporting structure >1m?	☐Yes ☐NO
	Distance to nearest intersection >10 m?	☐Yes ☐NO
	Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☐O3 ☐NH3 ☐HC ☐PM2.5 FRM ☐PM25cont ☐Pm25 spec ☐PM25 cont speciated ☒PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line?	☒Yes ☐NO
	Probe >10 m from the nearest tree drip line if tree acts as an obstruction?	☐Yes ☐NO ☒ NA
	Distance from probe (m)_____ Height of tree (m)_____	
	Distance between probe and drip line of water tower (m)_____14	☐N/A
ALL Parameters	Are there any obstacles to air flow?	☐Yes ☒NO
	Identify obstacle_____ Distance from probe (m) _____ Direction _____	
	Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 55 Direction SW	
	Name of nearest road W. Walnut St ADT _____ Year _____ Comments: _____ < 1000 estimate	
	Distance from probe to nearest railroad (m) 109 Direction SE ☐NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: Davidson **AQS#:** 37-119-1001

RECOMMENDATIONS:

1	Maintain current site situation?	☐Yes ☒NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Site terminated as of 12/31/10

Reviewer: Suzanne Hilbes **Date:** 04/08/11

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** Arrowood **AQS#:** 37-119-1005
Street Address: 400 Westinghouse Blvd **City:** Charlotte

Exact Longitude: W080 55' 11" **Exact Latitude:** N35 6' 47"

Parameters: ☐ **PM2.5** ☐ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☒ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☒ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☒Highest Concentration- O3	☐ Micro-	☒SLAMS- PM10, O3
☐Population Exposure-	☐ Middle-	☐Proposed NCore-
☒Source Oriented- PM10	☒Neighborhood- All	☐SPM -
☐Background-	☐ Urban-	☐SPM/AQI-
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☒ **N/A** ☐**PM2.5** ☐**PM25cont** ☐**PM10cont** ☐**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☐**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐**Yes** ☐**NO** ☐**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐**Ye s** ☐**NO** ☐**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☐**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☐**NO**
☐**N/A** ☒**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☒**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☒**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☐**Yes** ☐**NO** ☒**N/A**
☐**N/A** ☐**SO2** ☐**NOx** ☐**NOy** ☒**O3** ☐**NH3** ☐**HC** ☐**CO** (not micro)	Probe Height 3-15m?	☒**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☒**Yes** ☐**NO**

Site Name: Arrowood **AQS#:** 37-119-1005

☒N/A ☐CO micro only	Probe Height 2.5-3.5? Distance form horizontal and/vertical supporting structure >1m? Distance to nearest intersection >10 m? Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☒O3 ☐NH3 ☐HC ☐PM2.5 FRM ☐PM25cont ☐Pm25 spec ☐PM25 cont speciated ☒PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line? Probe >10 m from the nearest tree drip line if tree acts as an obstruction? Distance from probe (m)_____ Height of tree (m)_____ Distance between probe and drip line of water tower (m)_____	☒Yes ☐NO ☐Yes ☐NO ☒ NA ☒N/A
ALL Parameters	Are there any obstacles to air flow? Identify obstacle_____ Distance from probe (m) _____ Direction _____ Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☒NO ☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 63 Direction SW Name of nearest road Westinghouse Blvd ADT 22600 Year 2008 Comments: _____ Distance from probe to nearest railroad (m) 206 Direction NW ☐NA	
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: Arrowood **AQS#:** 37-119-1005

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

PM-10 monitoring terminated as of 12/31/10

Reviewer: Suzanne Hellberg **Date:** 04/08/11

SITE REVIEW FORM – 2011

Region: Mecklenburg County **Site Name:** County Line **AQS#:** 37-119-1009
Street Address: Hwy 29N @ Hudspeth Rd **City:** Charlotte

Exact Longitude: W80 41' 37" **Exact Latitude:** N35 20' 55"

Parameters: ☐ **PM2.5** ☐ **Pm2.5 Cont** ☐ **PM2.5 Speciated** ☐ **PM2.5 Cont Speciated**
☐ **PM10** ☐ **PM10 Cont** ☐ **TSP** ☐ **SO2** ☒ **O3** ☐ **CO** ☐ **NOy** ☐ **NOx**
☐ **HSCO** ☐ **HC** ☐ **Pb** ☐ **Meteorological**

MONITORING OBJECTIVE	SCALE	SITE TYPE
☒Highest Concentration- O3	☐ Micro-	☒SLAMS- O3
☐Population Exposure-	☐ Middle-	☐Proposed NCore-
☐Source Oriented-	☐Neighborhood-	☐SPM -
☐Background-	☒ Urban- **O3**	☐SPM/AQI
☐Transport-	☐ Regional-	

Answer All Applicable Questions

☒ **N/A** ☐**PM2.5** ☐**PM25cont** ☐**PM10cont** ☐**PM25spec** ☐**PM25 cont speciated**	Probe height 2-15m?	☐**Yes** ☐**NO**
	Distance between collocated PM2.5 sampler ≥ 1m?	☐**Yes** ☐**NO** ☐**N/A**
	Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	☐**Ye s** ☐**NO** ☐**N/A**
	Distance between a PM2.5 collocated with a PM10 TSP sampler ≥ 2m?	☐**Yes** ☐**NO** ☐**N/A**
	Near electrical substation/high voltage power lines?	☐**Yes** ☐**NO**
☒**N/A** ☐**PM10** ☐**CMB** ☐**TSP**	Probe Height 2-15m?	☐**Yes** ☐**NO**
	Distance from horizontal supporting structure >2m?	☐**Yes** ☐**NO**
	Distance between collocated PM10 or TSP samplers = 2 to 4 m?	☐**Yes** ☐**NO** ☐**N/A**
☐**N/A** ☐**SO2** ☐**NOx** ☐**NOy** ☒**O3** ☐**NH3** ☐**HC** ☐**CO** (not micro)	Probe Height 3-15m?	☒**Yes** ☐**NO**
	Distance form horizontal and/vertical supporting structure >1m?	☒**Yes** ☐**NO**

Site Name: County Line **AQS#:** 37-119-1009

☒N/A ☐CO micro only	Probe Height 2.5-3.5? Distance form horizontal and/vertical supporting structure >1m? Distance to nearest intersection >10 m? Distance to nearest traffic lane 2-10 m?	☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO ☐Yes ☐NO
☐N/A ☐SO2 ☐NOx ☐NOy ☒O3 ☐NH3 ☐HC ☐PM2.5 FRM ☐PM25cont ☐Pm25 spec ☐PM25 cont speciated ☐PM10 ☐PM10cont ☐TSP	Is probe >20 m from the nearest tree drip line? Probe >10 m from the nearest tree drip line if tree acts as an obstruction? Distance from probe (m)_____ Height of tree (m)_____ Distance between probe and drip line of water tower (m)_____	☒Yes ☐NO ☐Yes ☐NO ☒NA ☒N/A
ALL Parameters	Are there any obstacles to air flow? Identify obstacle_____ Distance from probe (m) _____ Direction _____ Distance from probe to obstacle is at least twice the height that the obstacle protrudes above the probe?	☐Yes ☒NO ☐Yes ☐NO
ALL Parameters	Distance of probe to nearest traffic lane (m) 128 Direction SE Name of nearest road Highway 29 ADT 18000 Year 2008 Comments: _____ Distance from probe to nearest railroad (m) _____Direction_____	☒ NA
ALL Parameters	Explain any sources of potential bias, include cultivated fields, loose bulk storage, stacks, vents, and construction activities. None	

Site Name: County Line **AQS#:** 37-119-1009

RECOMMENDATIONS:

1	Maintain current site situation?	☒Yes ☐NO
2	Change Monitoring objective?	☐Yes ☒NO
	New objective_____	
3	Change Scale representativeness?	☐Yes ☒NO
	New Scale_____	
4	Relocate site?	☐Yes ☒NO

COMMENTS:

Reviewer: Suzanne Hallen **Date:** 01/08/11