# Bureau of Air Quality

South Carolina Department of Health and Environmental Control

## State of South Carolina:
## Network Description and Ambient Air Network Monitoring Plan

# Calendar Year 2011

DRAFT

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

*This page left intentionally blank*

DRAFT

## CERTIFICATION

This document contains the planned changes and final description of the sites and monitors of the South Carolina Ambient Air Monitoring Network for criteria pollutants and related parameters for calendar year 2011. The South Carolina Department of Health and Environmental Control (DHEC) certifies that the network described herein meets or exceeds the minimum requirements needed to support the State Implementation Plan, national air quality assessments and policy decisions as required in 40 CFR Part 58, Ambient Air Quality Surveillance, at the time of submittal to the United States Environmental Protection Agency (EPA), Region 4. Due to circumstances that may arise during the implementation of the plan in 2010 and during the 2011 monitoring year, some elements of the network may require modification. A notification of modifications will be posted on the DHEC website and provided to EPA Region 4. Where necessary, a request for approval of deviations from this plan and supporting documentation will be submitted to EPA Region 4.

Scott Reynolds Signature: _____ Date: _____
Director, Division of Air Quality Analysis, Bureau of Environmental Services
South Carolina Department of Health and Environmental Control

Pat Walker Signature: _____ Date: _____
Chief, Bureau of Environmental Services
South Carolina Department of Health and Environmental Control

Robert Brown Signature: _____ Date: _____
Director, Division of Planning, Development and Outreach, Bureau of Air Quality
South Carolina Department of Health and Environmental Control

Myra C. Reece Signature: _____ Date: _____
Chief, Bureau of Air Quality
South Carolina Department of Health and Environmental Control

DRAFT

**Acronyms**

AQCR – Air Quality Control Region

AQI – Air Quality Index

AQS – Air Quality System

BAQ – Bureau of Air Quality

BC – Black Carbon

CAAA – Clean Air Act Amendment

CBSA – Core-Based Statistical Area

CFR – Code of Federal Regulation

CSA – Combined Statistical Area

DAQA – Division of Air Quality Analysis

EPA – Environmental Protection Agency

FDMS – Filter Dynamics Measurement System

FEM – Federal Equivalent Method

FRM – Federal Reference Method

GC/MS – Gas Chromatography / Mass Spectroscopy

HPLC – High Performance Liquid Chromatography

IC – Ion Chromatography

ICP – Inductively Coupled Plasma

IMPROVE – Interagency Monitoring of Protected Visual Environments

ICP/MS – Inductively Coupled Plasma Mass Spectroscopy

LAC – Light-Absorbing Carbon

MET - Meteorology

MSA – Metropolitan Statistical Area

mSA – Micropolitan Statistical Area

NAAQS – National Ambient Air Quality Standards

NATTS- National Air Toxics Trends Site

NADP-MDN – National Atmospheric Deposition Program Mercury Deposition Network

NATA – National Air Toxics Assessment

NCore – National Core Monitoring Network

NPAP – National Performance Audit Program

NWS – National Weather Service

PEP – Performance Evaluation Program

PSD – Prevention of Significant Deterioration

PTFE - Polytetrafluoroethylene

PUF – Polyurethane Foam

QA – Quality Assurance

QAPP – Quality Assurance Project Plan

QC – Quality Control

SAMWG – Standing Air Monitoring Working Group

DHEC – South Carolina Department of Health and Environmental Control

SLAMS – State and Local Air Monitoring Station

SPM – Special Purpose Monitor

STN – Speciation Trends Network

TBD - To be determined

TEOM – Tapered Element Oscillating Microbalance

TOT – Thermal Optical Transmittance

TSP – Total Suspended Particulate

US EPA – US Environmental Protection Agency

UV – Ultraviolet

WGS84 – World Geodetic System of 1984 revised in 2004

XRF – X-ray Fluorescence Spectroscopy

DRAFT

# TABLE OF CONTENTS


**Acronyms** ..... ii

**Introduction** ..... iv

**2011 Monitoring Network Plan: Public Participation Opportunities** ..... v

**Network Operation** ..... v

**Station Description Content** ..... 1

**Station Description** ..... 1
- Site Description ..... 1
- Monitor Details ..... 1
- Changes for 2011 ..... 5

**Network Summaries** ..... 7

**$PM_{2.5}$ Samplers Suitable for Comparison to the $PM_{2.5}$ National Ambient Air Quality Standards** ..... 8

**$PM_{2.5}$ and Ozone Design Values 2007 – 2009** ..... 9

**Summary of 2011 Network Changes** ..... 10

**Greenville-Spartanburg-Anderson CSA** ..... 12
- **Big Creek** ..... 14
- **Cowpens** ..... 15
- **Taylors** ..... 16
- **Greenville Employment Security Commission (ESC)** ..... 17
- **Hillcrest Middle School** ..... 19
- **Famoda Farms** ..... 20
- **Long Creek** ..... 21
- **Clemson CMS** ..... 22
- **North Spartanburg Fire Station #2** ..... 23
- **T.K. Gregg Recreation Center** ..... 24

**Columbia-Newberry CSA** ..... 25
- **Irmo** ..... 27
- **Cayce CMS** ..... 28
- **Cayce City Hall** ..... 29
- **Parklane (NCore)** ..... 30
- **Bates House (USC)** ..... 32
- **State Hospital** ..... 33
- **Congaree Bluff** ..... 34
- **Sandhill Experimental Station** ..... 35

**Charlotte-Gastonia-Salisbury CSA (part)** ..... 36
- **York CMS** ..... 37

**Myrtle Beach-Conway-Georgetown CSA** ..... 38
- **Georgetown CMS** ..... 39
- **Howard High School #3** ..... 40
- **Jackson Middle School** ..... 42
- **Trenton** ..... 43

**Charleston-North Charleston MSA** ..... 44
- **Bushy Park Pump Station** ..... 45
- **Jenkins Ave. Fire Station** ..... 46
- **Cape Romain** ..... 47
- **FAA** ..... 49
- **Charleston Public Works** ..... 50
- **North Charleston $PM_{2.5}$ SPM Site** ..... 51

**Florence MSA** ..... 52
- **Pee Dee Experimental Station** ..... 53
- **Williams Middle School** ..... 54

**Remainder of State** ..... 55
- **Due West** ..... 56
- **Chesterfield** ..... 57
- **Ashton** ..... 59

**Network Development** ..... 60

**Sites Discontinued** ..... 61
- **Anderson Library** ..... 62
- **H L Sneed Middle School** ..... 63
- **Beck Administration Center** ..... 64
- **West View** ..... 65


*Cover Photo: Cape Romain monitoring site located in Charleston County, SC*

DRAFT

## Introduction

The South Carolina Department of Health and Environmental Control (Department) or its predecessors have operated an air quality monitoring network in South Carolina since 1959. Since that time, the network has continually evolved to meet the requirements and needs of the Department's Air Program. In 2011 the network will comprise of 115 monitors and samplers at 34 sites.

In October, 2006, the United States Environmental Protection Agency (EPA) published revisions to the ambient monitoring regulations (71 FR 61236, October 17, 2006) requiring quality assurance, monitor designations, minimum requirements for both number and distribution of monitors among metropolitan statistical areas (MSAs), and probe siting changes. The regulation also included the requirement for an annual monitoring network plan and periodic network assessments.

Monitor designations include the State and Local Air Monitoring Station (SLAMS), special purpose monitoring (SPM) and the National Core Monitoring Network (NCore). The SLAMS air monitoring network is specific for the criteria pollutants, those pollutants for which National Ambient Air Quality Standards (NAAQS) have been established. In addition to a SLAMS network, the air monitoring network includes SPM for air toxics, particulate, mercury, criteria pollutants, precipitation and meteorology.

This plan covers the eighteen month period from July 1, 2010 through December 31, 2011. This period includes a 6 month implementation period during which sites indicated as 'new' will be identified, secured and prepared for the installation of monitoring equipment. It is expected that any monitoring indicated as 'New' or 'to be established' will be installed, calibrated and operating in 2011 with the exception of some Ozone monitors which may begin operation at the start of the South Carolina Ozone Monitoring Season (April-October). Stakeholder groups have committed to assist in identifying and securing access to suitable locations. These efforts will continue in this and in subsequent monitoring plans as the Department continues to identify new monitoring needs.

The annual monitoring network plan, as required and described 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:

- The Air Quality System (AQS) site identification number for existing stations.
- The location, including street address and geographical coordinates, for each monitoring station.
- The sampling and analysis method used for each measured parameter.
- The operating schedule for each monitor.
- Any proposal to remove or relocate a monitoring station within a period of eighteen months following the plan submittal.
- The monitoring objective and spatial scale of representativeness for each monitor.
- The identification of any sites that are suitable for comparison against the $PM_{2.5}$ NAAQS.
- The Metropolitan Statistical Area (MSA), Core-Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.

This document constitutes the South Carolina Air Monitoring Network Plan and is organized into two main parts:

**Network Summaries:** Presenting the total number of sites and monitors for the State. Also included is a listing of all proposed changes to the current network.

Air Monitoring **Station Description:** An outline of the designations, parameters, monitoring methods, and the purpose for each monitor at the site.

The South Carolina Ambient Monitoring Network will be reviewed annually. Planned changes will be described in this plan (and its annual revisions) and provided for public review

DRAFT

and comment prior to submission to the EPA Region 4 Administrator.

**2011 Monitoring Network Plan: Public Participation Opportunities**

In anticipation of the need for an updated monitoring plan, heightened public interest and potential impact of the monitoring regulation changes, the Air Program once again solicited involvement from both internal (to the Department) and external workgroups.

An external workgroup was convened with invited representatives of the business, environmental and health communities.

Other opportunities for public involvement include:

- A web page maintained for publication and access to draft and reference documents and announcements[1].
- Availability of the proposed **Ambient Monitoring Plan for public review and comment runs from May 28 to June 28, 2010.** All recorded participants who registered in the outreach and discussion activities were notified when the plan became available for review.
- Meetings and conference calls with the stakeholder groups throughout the process.

The Department is committed to continuing the involvement and participation opportunities in the development of the annual revisions of the Monitoring Plan and the periodic assessments of the air quality surveillance system.

**Network Operation**

The primary responsibility for the operation of the South Carolina Ambient Monitoring Network (Monitoring Network) is assigned to the Division of Air Quality Analysis in the Bureau of Environmental Services (Division). The Division establishes, maintains and operates the sites and instruments that make up the network and performs the analysis of samples collected as part of routine monitoring or special projects. Data generated by the network for comparison to the National Ambient Air Quality Standards (NAAQS) is verified to be accurate and reported by the Division and stored in the national Air Quality System (AQS) database.

Criteria pollutant monitoring for the purpose of comparison to the NAAQS is performed using EPA designated Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) to ensure the precision and accuracy of the measurements across the air quality surveillance system.

Regular calibration and audits of the measurement systems are performed to verify that the instruments are operating correctly and data being collected is accurate. The quality assurance activities supporting the Monitoring Network meet or exceed the quality assurance requirements defined in 40 CFR Part 58 Appendix A (Quality Assurance Requirements for SLAMS, SPMs and PSD Air Monitoring).

Raw data is collected hourly from sites across the state and provided to internal data users (forecasters and data analysts) and to the AIRNow database for presentation to the public. Before the data is submitted to AQS it is verified to be accurate through review of the instrument Quality Control (QC) and Quality Assurance (QA) performance documentation.

Instrument QA/QC alone is not sufficient to assure monitoring data quality. For this reason, the Department, in addition to periodic site assessments, has begun conducting additional visits of monitoring sites with involvement of stakeholder groups to enable comparison with applicable siting criteria.

It is the Department's intent that all criteria pollutant monitors and samplers be sited and operated consistent with the requirements of 40 CFR Part 58 and Appendices A (Quality Assurance), C (Methods), D (Network Design) and E (Probe Siting Criteria) and the data collected by these samplers and monitors is suitable for comparison to the NAAQS. The Department further intends to assure that the samplers and monitors comply with as many of the recommendations contained within the regulations and applicable guidance documents as is possible.

[1] http://www.scdhec.net/environment/baq/ambientairmonitoring.aspx

DRAFT

An element of the Quality System[2] employed by the Division is periodic assessments of systems and monitor performance. As the primary quality assurance organization for ambient air monitoring activities, the Division operates under the approved Environmental Quality Control Quality Assurance Management Plan, the Ambient Air Quality Monitoring Quality Assurance Project Plan and approved plans for specific projects. EPA Region 4 provides periodic Technical Systems Audits of sampling and analytical methods, network operation, data collection and reporting and Quality Assurance activities at their discretion or at the request of the Department's Air Program. EPA Region 4 may conduct audits of any component of the operation of the network or quality management system. The Division also participates in the National Performance Audit Program (NPAP) and the Performance Evaluation Program (PEP) administered by EPA to provide independent audits of criteria pollutant monitoring and performance.

DRAFT

[2] The Quality System is the means by which the Department implements the quality management process through the Quality Assurance Management Plan for SC DHEC, July, 2008.

**Station Description Content**

Specific siting information for each site and monitor is stored in the EPA's AQS, the national ambient air database. The AQS Site Description includes the exact location of the site, local and regional population, and description of the site location, monitor types, and monitoring objectives. This site and monitor information is routinely updated whenever there is a change in site characteristics or pollutants monitored.

AQS is used as the primary repository for all South Carolina ambient monitoring data including site descriptions. All ambient monitoring data is stored in AQS, including non NAAQS parameters, ambient toxics, total suspended particulate and supporting quality assurance data.

**Station Description**

The network station descriptions contained in this document include the following information:

*Site Description*

The header for each site includes:

**Site Name**

The **Core Based Statistical Areas** (CBSA) as defined by the US Census. (November 2004).[3]

**AQS Site ID:** The unique site identification number used in AQS in the form:

**45-0cc-ssss**
Where:
**45** is the state identification code for SC,
**cc** is the county identification code and
**ssss** is the site identification code within the county.

**Location:** Typically the street address of the site where available.

**County:** County in which the site is located.

**Coordinates:** Listed in decimal degrees, Latitude (N) then Longitude (W) using WGS84 projection.

**Date Established:** The date when each existing monitoring station was established is shown in the description. For new stations proposed in this plan, a date is provided when it is expected for the station to be in operation. Individual monitors at a site may have differing start and stop dates.

Date of most recent **Site Evaluation:** Each monitoring station in the network is periodically visited to determine whether all required probe exposure criteria for monitors are met. If necessary, corrective action is scheduled to address deficiencies. If a monitoring site has not yet been evaluated, it will be denoted with the word "pending". Auditors may visit sites to provide an additional, independent quality assurance check on the site evaluations. When an additional independent check has been conducted, the date of the visit will be noted next to the date of the latest site evaluation and contained within parentheses.

*Monitor Details*

In a table associated with each site the parameters monitored at that site are listed along with descriptive information associated with that parameter.

**Parameter**

Criteria (compounds for which a National Ambient Air Quality Standard has been established), non criteria and/or supporting parameters (primarily meteorological measurements) measured at the site are listed.

**Scale**

Each monitor or sampler in the monitoring network is described in terms of the approximate physical dimensions of the air parcel nearest the monitoring station throughout which pollutant concentrations are expected to be reasonably similar. This is most often referred to as the *Scale* of the monitor. Different pollutants monitored at the same location may represent different scales depending on the characteristics of the pollutant. Area dimensions or scales of representativeness used in the network description are:

(a) Microscale

[3] The US Census Bureau periodically adjusts CBSA names and boundaries. This plan uses the latest available revision.

DRAFT

Air volumes associated with area dimensions ranging from several meters up to about 100 meters.

(b) Middle scale

Areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

(c) Neighborhood scale

Extended areas of a city that has relatively uniform land use with dimensions ranging from 0.5 to 4.0 kilometers.

(d) Urban scale

Citywide or equivalent rural areas with dimensions ranging from 4 to 50 kilometers.

(e) Regional scale

Areas ranging from 50 to hundreds of kilometers in diameter.

The true representative area may best be described by an irregular shape of the approximate dimensions indicated above accounting for local sources and differing land use.

The representative scale of a monitor is closely associated with the objective of the monitoring.

**Objective**

The ambient monitoring network is designed to meet three primary objectives:

Provide air pollution data to the public in a timely manner. Near real-time data is made available on the internet through AIRNow and Air Quality Index (AQI) reporting and forecasting in the major metropolitan areas.

Support compliance with ambient air quality standards and emissions strategy development. Monitors are operated to measure concentrations for comparison to NAAQS and to provide information to aid the development of strategies to improve air quality.

Support air pollution research studies. Data from the monitoring networks support greater understanding of the impacts and effects of ambient air pollution.

Individual monitors within a monitoring network that support these basic objectives generally serve one or more of the following purposes:

- Determine highest concentrations of pollutants,
- Determine representative concentrations in areas of high population density,
- Determine impact on air quality of significant sources or source categories,
- Determine general background concentrations,
- Determine extent of regional pollutant transport, and
- Determine welfare-related impacts in more rural and remote areas (ex. visibility impairment and impacts to vegetation).

The design intent in siting stations is to correctly match the area represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the monitor. The relationship of appropriate scale to the six basic purposes are:

| **Monitoring Purpose** | **Siting Scale** |
|---|---|
| Highest concentration | Micro, Middle, Neighborhood |
| Population | Neighborhood, Urban |
| Source impact | Micro, Middle, Neighborhood |
| General/background | Neighborhood, Urban, Regional |
| Regional transport | Urban, Regional |
| Welfare-related impacts | Urban, Regional |

Monitor and sampler data is regularly reviewed to assure the assigned scale is correct and appropriate for the intended objective.

**Designation**

Required and long term criteria pollutant monitors described in the air quality monitoring

DRAFT

network are designated **State and Local Air Monitoring Stations (SLAMS)**.

**SLAMS:** EPA requirements for air quality surveillance systems provide for the establishment of a network of monitoring stations designated SLAMS that measure ambient 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.

Monitoring at some locations meets Air Program needs beyond that necessary for compliance with minimum requirements. **Special Purpose Monitors (SPM)** are operated to meet specific Air Program needs and may be long term or part of special studies designed to answer specific questions.

**SPM:** Monitors in the air quality surveillance network not designated SLAMS are Special Purpose Monitors. Special Purpose Monitors support investigations addressing complaints, areas and pollutants of concern, network refinement, modeling verification and compliance. These monitors are committed to investigation and projects as described in the associated Quality Assurance Project Plan (QAPP). They may be located as separate monitoring stations or be included at existing monitoring locations. Monitoring data will be reported to AQS where possible. Siting and probe exposure will conform to all requirements for SLAMS monitors whenever possible.

Both SLAMS and SPM data may be used in the reporting of an area Air Pollutant Quality Index.

**Air Quality Index (AQI):** The AQI is a method of reporting that converts concentration levels of pollution to a simple number scale of 0-500. Index reporting is required for all urban areas with a population exceeding 350,000. Intervals on the AQI scale are related to potential health effects of the daily measured concentration of the measured pollutants. All stations in a metropolitan area provide data for daily index reporting. Data collected from continuous monitors for Ozone and $PM_{2.5}$ monitors is collected hourly and reported as AQI maps on EPA's AIRNow website. A daily AQI is provided for the Greenville-Spartanburg, Columbia, and Charleston-North Charleston areas.

**Probe Height**

The monitor or sampler probe is the point where ambient air enters the analytical or sample collection system. Ideally, air would be sampled at approximately nose height, but due to operational, exposure and security considerations air may be sampled further from ground level. Proper probe height is specified in the monitoring regulations (typically between 2 and 15 meters) and is checked as part of the periodic site evaluations.

**Analysis Methods**

All sampling and analytical procedures used for comparison of ambient concentrations of criteria pollutants to the NAAQS will use designated Federal Reference (FRM) or equivalent (FEM) methods. Where appropriate for specific monitoring objectives, well characterized non-equivalent methods may be used.

- **Particulate Matter ≤ 10 microns ($PM_{10}$)**

$PM_{10}$ samplers operated by the Department are designated as either FRM or FEM samplers and are operated according to the requirements set forth in 40 CFR Part 50 and 40 CFR Part 58. Intermittent samplers collect a 24-hr sample no less than every sixth day on a quartz filter. The filter is conditioned and weighed before and after the sample run. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter ($\mu g/m^3$). The quartz filters are equilibrated before each weighing for a minimum of 24 hours at a 20-23°C mean temperature and a 30-40% mean relative humidity.

Continuous $PM_{10}$ samplers provide 24-hour concentration measurements every day. During sampling, ambient air passes through an inlet designed to pass only particles smaller than 10 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference

DRAFT

between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the flow rate. Data is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

- **Particulate Matter ≤ 2.5 microns ($PM_{2.5}$)**

All $PM_{2.5}$ samplers operated by the Department are designated FRM samplers. Manual samplers are operated per the requirements set forth in 40 CFR Part 50, Appendix L. Samples are collected on 46.2 mm Polytetrafluoroethylene (PTFE) filters over a 24-hour sampling period. Air flow through the filter is maintained at 16.7 liters per minute. The flow rate must not vary more than +/-5% for five minutes over a 24-hour sample period at actual ambient temperature and pressure. Samples are retrieved within 96 hours of the end of the sample run and are kept cool (4°C or cooler) during transit to meet the thirty-day limit for final weighing.

The PTFE filters are equilibrated and weighed before and after the sample run for a minimum of 24 hours at a controlled atmosphere of 20-23°C mean temperature and 30-40% mean relative humidity. Filters are used within thirty days of initial weighing. Filters must be re-weighed within thirty days of the end of the sample run if kept at 4°C or cooler. The gain in weight in relation to the volume of air sampled is calculated in $\mu g/m^3$.

Continuous $PM_{2.5}$ monitors provide hourly measurements for AQI reporting but do not provide concentration data currently suitable for comparison to the NAAQS. During monitoring, ambient air passes through an inlet system designed to pass only particles smaller than 2.5 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the flow rate. Data is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

<u>$PM_{2.5}$ Speciation sampling and analysis</u>

In addition to operating $PM_{2.5}$ samplers that allow measurement of only $PM_{2.5}$ mass concentration, the Department also operates $PM_{2.5}$ speciation samplers that collect samples that are analyzed to determine the chemical makeup of $PM_{2.5}$. Samples are collected on a set of three cartridges over a 24-hour sampling period. The individual cartridges contain denuders and filters designed to efficiently capture the major components of $PM_{2.5}$.

After collection, the samples are shipped in ice chests to the EPA contract laboratory for analysis. At the laboratory the samples are analyzed using thermal optical analysis (for carbon), ion chromatography and x-ray fluorescence (for metals) to determine the presence and concentration of specific compounds. Sample results are stored in AQS.

- **Sulfur Dioxide**

Instruments used to continuously monitor sulfur dioxide concentrations in the atmosphere employ the FEM Ultraviolet (UV) fluorescence method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of these instruments is done dynamically using EPA protocol gas mixtures containing a known concentration of sulfur dioxide in nitrogen. This gas is diluted to give varying known concentrations of sulfur dioxide. These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Carbon Monoxide**

Continuous monitoring for carbon monoxide is performed by use of the FRM non-dispersive infrared correlation method. Data is stored locally

DRAFT

on redundant data acquisition systems and recovered hourly by the Division automated central data acquisition system.

Calibration of the instrument is done dynamically using EPA Protocol gas mixtures containing a known concentration of carbon monoxide in air. The gas is diluted to give varying known concentrations of carbon monoxide. These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Ozone**

Ozone is monitored using the FEM Ultraviolet (UV) photometry method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by the Division automated central data acquisition system.

Monitors are routinely calibrated using portable ozone transfer standards. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Nitrogen Dioxide**

The FRM chemiluminescence and UV methods are used in monitoring the nitrogen dioxide concentration in the ambient air. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of the instrument is done dynamically using EPA protocol gas mixtures containing a known concentration of nitric oxide in nitrogen. The gas is diluted to give varying known concentrations of nitric oxide. An ozone generator and converter are used to convert Nitric Oxide (NO) to Nitrogen Dioxide ($NO_2$). These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Lead**

Lead concentrations are determined from the analysis of total suspended particulate collected using high volume particulate samplers as described in 40 CFR §50 Appendix G. Particulate samples are acid extracted to dissolve the metals. The lead content is determined using Flame Atomic Absorption or Inductively Coupled Plasma (ICP) spectrophotometry.

**Sampling Frequency**

Measurements of the parameters related to air quality are performed using sampling and continuous monitoring. Sampling frequency is the indicator of how often a measurement is made and reported.

**Sampling** typically involves collection of a sample over a period (typically 24 hours, midnight to midnight) and delivery of the sample to the laboratory for preparation and analysis. Samples are collected every day (1:1), every third day (1:3), every sixth day (1:6) and for some projects, every twelfth day (1:12) depending on the data quality objectives necessary for the project. Results of the analysis are reported as averages for the period. The EPA publishes 1:3 and 1:6 day sampling schedules used nationwide and by the Monitoring Network. [4]

**Monitoring** typically uses on-site analyzers that continuously sample the air and measure the pollutant of interest. Results of the analysis are reported as hourly averages.

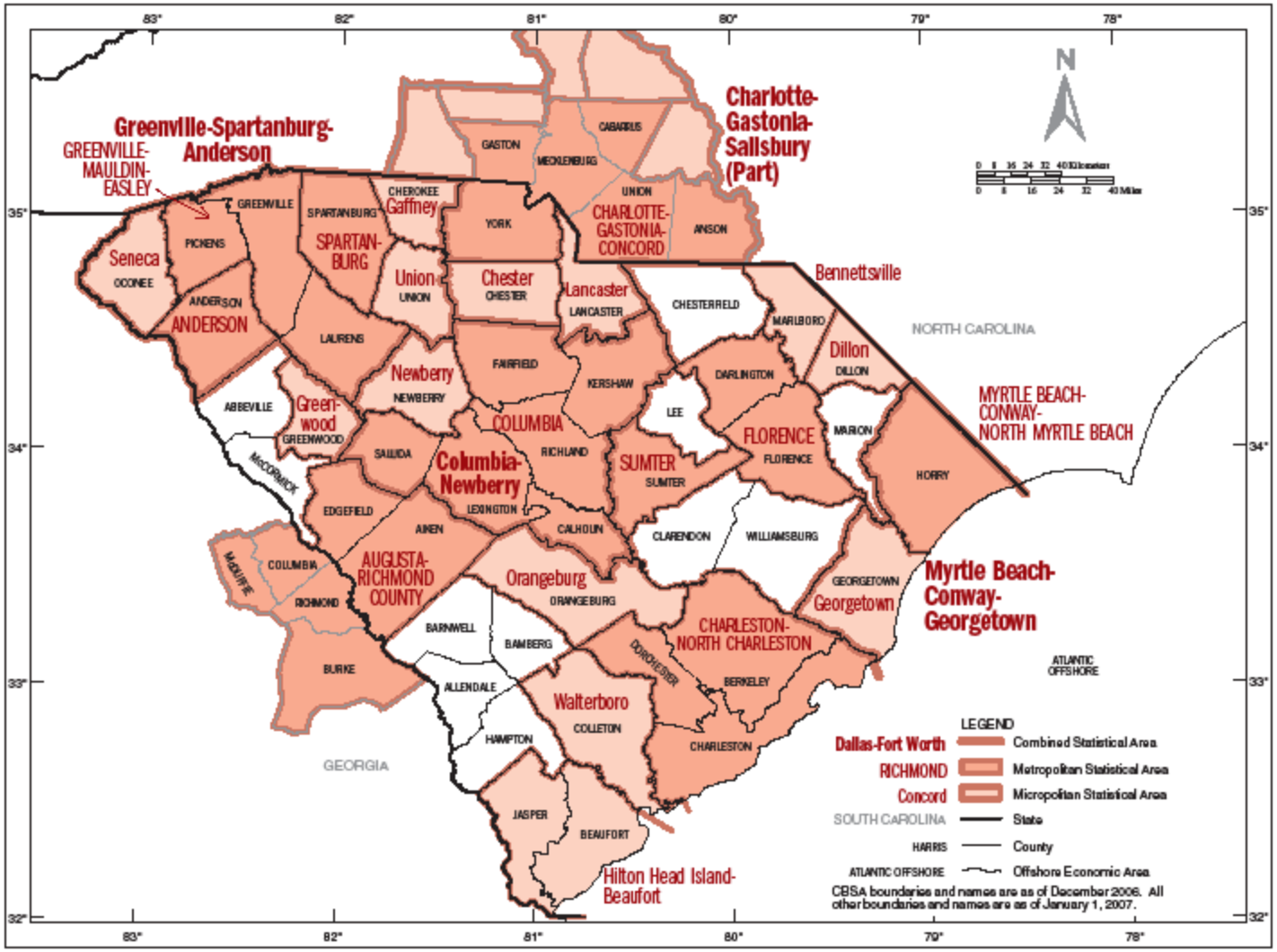
*Changes for 2011*

Any planned changes in parameters monitored, the configuration or operations at the site planned for 2011 are described herein and summarized in the Summary of 2011 Network Changes. Unless otherwise indicated, changes at a site including the beginning of new monitoring activity will be effective January 1, 2011. Ozone monitoring for 2011 at new or special project sites may start at the beginning of the ozone monitoring season (April-October).

[4] http://www.epa.gov/ttn/amtic/calendar.html

DRAFT

SOUTH CAROLINA - Core Based Statistical Areas and Counties




U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau

**Network Summaries**

**Calendar Year 2011 Air Monitoring Stations**

| Region | Sites | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | TSP/Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | Mercury | Acid Rain | MET | VOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Greenville-Spartanburg-Anderson CSA | 10 | 6 | 3 | 1 | 1 | 0 | 1 | 7 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 0 |
| Columbia CSA | 8 | 4 | 2 | 1 | 4 | 1 | 2 | 3 | 3 | 3 | 1 | 0 | 1 | 2 | 3 | 2 | 1 | 6 | 0 |
| Charlotte-Gastonia-Salisbury CSA | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Myrtle Beach-Conway-Georgetown CSA | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Augusta-Richmond County MSA | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Charleston-North Charleston MSA | 6 | 4 | 3 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Florence MSA | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest of State | 3 | 1 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 2 | 1 |
| TOTALS | 34 | 17 | 12 | 4 | 9 | 1 | 4 | 19 | 7 | 6 | 3 | 2 | 4 | 3 | 4 | 2 | 4 | 14 | 1 |

This summary table presents the elements of the South Carolina Ambient Air Monitoring Network after implementation of the changed described in this plan.

DRAFT

**$PM_{2.5}$ Samplers Suitable for Comparison to the $PM_{2.5}$ National Ambient Air Quality Standards**

| Sites using Federal Reference Method | Site suitable for comparison to annual standard? | Site suitable for comparison to the 24-Hour standard? | Site Description Page number |
|---|---|---|---|
| Taylors | Yes | Yes | 16 |
| Greenville ESC | Yes | Yes | 17 |
| Long Creek | Yes | Yes | 21 |
| T.K. Gregg | Yes* | Yes* | 24 |
| Irmo | Yes | Yes | 27 |
| Parklane | Yes | Yes | 30 |
| Bates House | Yes | Yes | 32 |
| Trenton | Yes | Yes | 43 |
| FAA | Yes | Yes | 49 |
| Charleston Public Works | Yes | Yes | 50 |
| North Charleston | Site not yet established | Site not yet established | 51 |
| Williams Middle School | Yes* | Yes* | 54 |
| Chesterfield | Yes | Yes | 57 |
| * Sites without a complete three year data record but expected to be suitable for comparison to primary and secondary annual and 24-hour standards. | | | |

DRAFT

**$PM_{2.5}$ and Ozone Design Values 2007 – 2009**

This section presents the latest $PM_{2.5}$ and Ozone ambient air quality summary data for currently operating monitoring sites throughout South Carolina. All other Criteria Pollutant design values were well below the level of the standards in 2009.

| **$PM_{2.5}$ Design Values 2007 – 2009** | | | |
|---|---|---|---|
| Site ID | Site Name | Annual ($\mu g/m^3$) | Daily ($\mu g/m^3$) |
| 45-045-0009 | Taylors | 12.3 | 25 |
| 45-045-0015 | Greenville ESC | N/A | N/A |
| 45-073-0001 | Long Creek | 9.3 | 17 |
| 45-083-0010 | Westview | 11.9 | 25 |
| 45-083-0011 | T.K. Gregg | N/A | N/A |
| 45-063-0008 | Irmo | 12.1 | 25 |
| 45-079-0007 | Parklane | 12.1 | 27 |
| 45-079-0019 | Bates House | 12.1 | 25 |
| 45-037-0001 | Trenton | 11.3 | 24 |
| 45-019-0048 | FAA | 10.0 | 22 |
| 45-019-0049 | Charleston Public Works | 9.5 | 22 |
| 45-041-0002 | HL Sneed | 11.2 | 23 |
| 45-041-0003 | Williams | N/A | N/A |
| 45-025-0001 | Chesterfield | 10.9 | 22 |

| **Ozone Design Values 2007 – 2009** | | |
|---|---|---|
| Site ID | Site Name | Design Value (ppm) |
| 45-007-0005 | Big Creek | N/A |
| 45-021-0002 | Cowpens | 0.067 |
| 45-045-0016 | Hillcrest | N/A |
| 45-045-1003 | Famoda Farm | N/A |
| 45-073-0001 | Long Creek | 0.071 |
| 45-077-0002 | Clemson CMS | 0.075 |
| 45-083-0009 | North Spartanburg Fire Station | 0.078 |
| 45-079-0007 | Parklane | 0.072 |
| 45-079-0021 | Congaree Bluff | 0.067 |
| 45-079-1001 | Sandhill | 0.075 |
| 45-091-0006 | York | 0.072 |
| 45-003-0003 | Jackson | 0.075 |
| 45-037-0001 | Trenton | 0.069 |
| 45-015-0002 | Bushy Park | 0.060 |
| 45-019-0046 | Cape Romain | 0.067 |
| 45-031-0003 | Pee Dee | 0.071 |
| 45-001-0001 | Due West | 0.072 |
| 45-025-0001 | Chesterfield | 0.070 |
| 45-029-0002 | Ashton | 0.067 |

DRAFT

**Summary of 2011 Network Changes**

Thoughout the rest of this document, the symbol "†" with in the monitoring table will denote a new parameter being measured.

**Greenville-Spartanburg-Anderson CSA**

**Anderson MSA**

All monitoring at Anderson Library (45-007-0004) will be terminated.

**Greenville MSA**

Monitor type for continuous $PM_{2.5}$ monitoring at Greenville ESC (45-045-0015) has been changed to SPM and Non-regulatory.[5]

$PM_{2.5}$ sampling will be added to the Hillcrest (45-045-0016) site to compare to Taylors (45-045-0009).

**Spartanburg MSA**

All sampling at Westview (45-083-0010) has been terminated.

Monitor type for continuous $PM_{2.5}$ monitoring at T.K. Gregg (45-083-0011) has been changed to SPM and Non-regulatory.[5]

**Columbia-Newberry CSA**

**Columbia MSA**

Monitor type for continuous $PM_{2.5}$ monitoring at Irmo (45-063-0008) has been changed to SPM and Non-regulatory.[5]

**Charlotte-Gastonia-Salisbury CSA (South Carolina portion includes Chester, Lancaster and York County)**

**Charlotte-Gastonia-Concord MSA**

No changes planned for 2011.

**Myrtle Beach-Conway-Georgetown CSA**

**Georgetown Micropolitan Statistical Area**

All monitoring at Beck Administration (45-043-0012) will be terminated.

$PM_{10}$ monitoring at Georgetown CMS (45-043-0006) will be terminated.

**Augusta-Richmond County MSA (South Carolina portion includes Aiken and Edgefield Counties)**

Monitor type for continuous $PM_{2.5}$ monitoring at Trenton (45-037-0001) has been changed to SPM and Non-regulatory.[5]

**Charleston-North Charleston MSA**

Installation of a continuous $PM_{2.5}$ site in North Charleston.

Monitor type for continuous $PM_{2.5}$ monitoring at Cape Romain (45-019-0046) has been changed to SPM and Non-regulatory.[5]

[5] Based on Weinstock technical note on the use of non-regulatory monitor type code in AQS to denote continuous $PM_{2.5}$ monitors that are not intended to provide data for regulatory purposes.(March 19, 2009). http://www.epa.gov/ttn/amtic/files/ambient/pm25/datamang/Non%20Regulatory%20Monitor%20Type%20Guidance.pdf

DRAFT

All sampling and monitoring at CPW (45-019-0049) will be terminated once a replacement site has been identified and established.

Monitor type for continuous $PM_{2.5}$ monitoring at CPW (45-019-0049) has been changed to SPM and Non-regulatory.[5]

**Florence MSA**

All sampling at Sneed (45-041-0002) has been terminated.

Monitor type for continuous $PM_{2.5}$ monitoring at Williams Middle School (45-041-0003) has been changed to SPM and Non-regulatory.[5]

**Remainder of State**

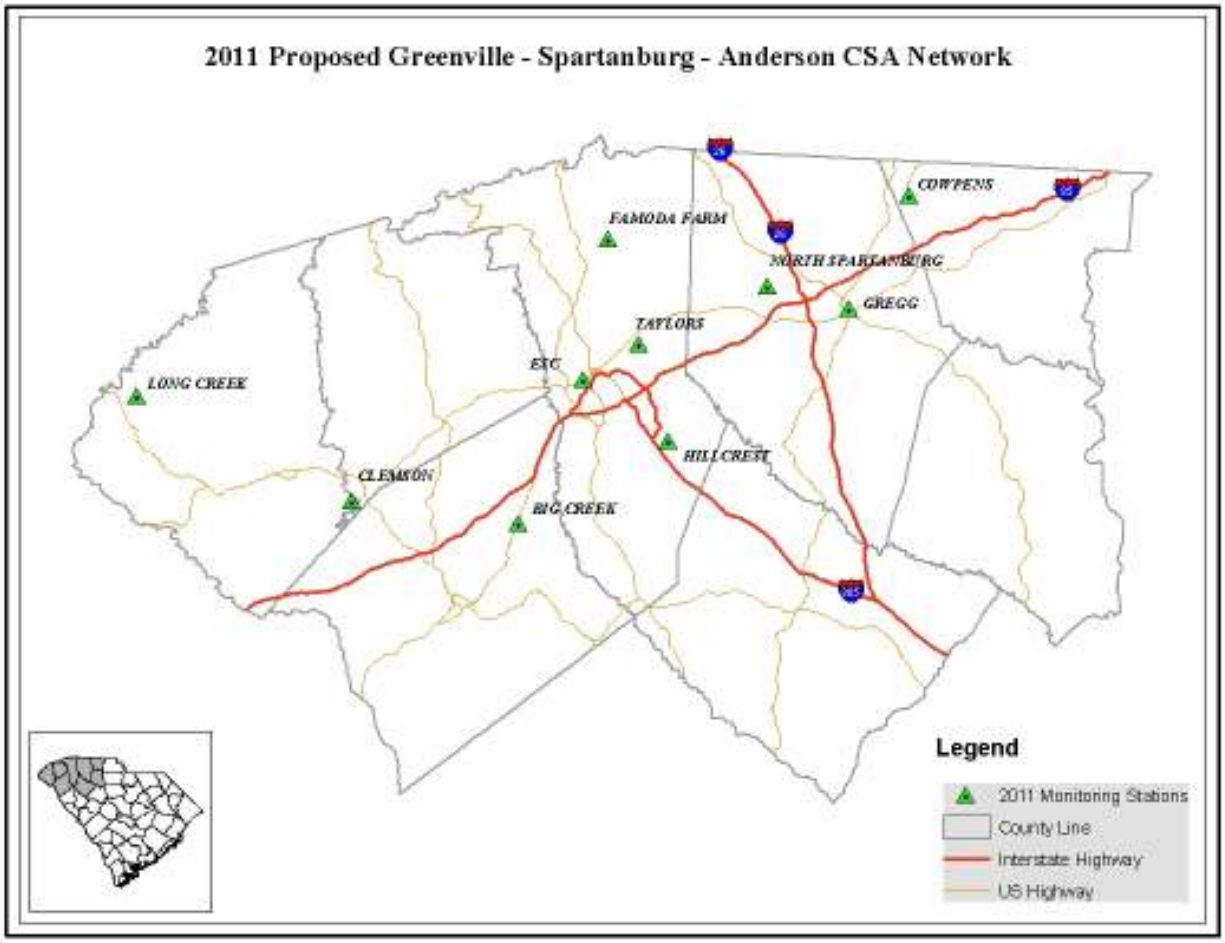
Monitor type for continuous $PM_{2.5}$ monitoring at Chesterfield (45-025-0001) has been changed to SPM and Non-regulatory.[5]

Monitor type for continuous $PM_{2.5}$ monitoring at Ashton (45-029-0002) has been changed to SPM and Non-regulatory.[5]

DRAFT

**Site Descriptions**

**Greenville-Spartanburg-Anderson CSA**



Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-007-0005 | Big Creek | | | | | | | ● | | | | | | | | | | | |
| 45-021-0002 | Cowpens | | | | | | | ○ | | | | | | | | | | ○ | |
| 45-045-0009 | Taylors | ●● | | | | | | | | | | | | | | | | | |
| 45-045-0015 | Greenville ESC | ● | ○ | ○ | ● | | ○ | | ○ | ○ | ○ | ○ | ○ | | | | | | ○ |
| 45-045-0016 | Hillcrest | ○ | | | | | | ● | | | | | | | | | | | |
| 45-045-1003 | Famoda Farms | | | | | | | ● | | | | | | | | | | | |
| 45-073-0001 | Long Creek | ● | ○ | | | | | ○ | ○ | | | | | | | | | ○ | ○ |
| 45-077-0002 | Clemson | | | | | | | ● | | | | | | | | | | | |
| 45-083-0009 | North Spartanburg Fire Station #2 | | | | | | | ● | | | | | | | | | | | |
| 45-083-0011 | T.K. Gregg | ● | ○ | | | | | | | | | | | | | | | | |
| | TOTAL | 6 | 3 | 1 | 1 | 0 | 1 | 7 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 |

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA samplers

DRAFT

**Big Creek**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Anderson MSA
**AQS Site ID:** 45-007-0005
**Location:** 215 McAlister Road
**County:** Anderson
**Coordinates:** 34.623, -82.532
**Date Established:** June 6, 2008
**Site Evaluation:** pending (QA Check: September 15, 2009).

---

This site fulfills the minimum requirement for ozone monitoring in the Anderson MSA. This site is northeast of the City of Anderson in the area expected to be representative of maximum ozone concentrations in the Anderson MSA.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration / Upwind Background | SLAMS | 4.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Cowpens**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA
**AQS Site ID:** 45-021-0002
**Location:** McGinnis Road (Old SC 110)
**County:** Cherokee
**Coordinates:** +35.130396, -81.816567
**Date Established:** March 25, 1988
**Site Evaluation:** The most recent site evaluation was conducted on June 26, 2006 (QA Check: May 02, 2008).

---

The Cowpens site is located in northwestern Cherokee County at the Cowpens National Battlefield. Cowpens is sited to represent ozone concentrations between the Greenville-Spartanburg-Anderson and the Charlotte-Gastonia-Salisbury CSA. The operation of the ozone monitor fulfills the ambient monitoring commitment in the Cherokee County Maintenance Plan.[6] In addition to ozone, the Cowpens site also supports an acid precipitation sampler. The sample inlets are 23.0 meters from the nearest road.

The monitor will be operated thru the 2014 ozone season to fulfill the Cherokee County Maintenance Plan commitments.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Upwind / Background | SPM | 3.0 | FEM Ultraviolet Photometry | Continuous |
| Acid Rain | Regional | Regional Transport | SPM | 1.5 | IC | Weekly |

[6] 110(a)(1) Maintenance Plan: 8-hour Ozone National Ambient Air Quality Standard, Cherokee County, South Carolina, December, 2007.

DRAFT

**Taylors**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville-Mauldin-Easley MSA
**AQS Site ID:** 45-045-0009
**Location:** 405 Brushy Creek Road
**County:** Greenville
**Coordinates:** +34.899141, -82.313070
**Date Established:** May 1, 1999
**Site Evaluation:** The most recent site evaluation was conducted on April 7, 2005 (QA Check: September 15, 2009).

---

This monitoring site is in a residential area of the town of Taylors on the grounds of a city fire station. The Taylors site was originally established as the location of one of two $PM_{2.5}$ Core samplers representing the Greenville-Spartanburg Monitoring Planning Area. The Taylors site has a FRM $PM_{2.5}$ and a collocated $PM_{2.5}$ FRM used for determination of method precision. The sample inlets are 27.0 meters from the nearest road.

Changes for 2011:

The Department will evaluate a more suitable monitoring location for $PM_{2.5}$ in the Greenville urbanized area within the next 18 months. Monitoring at Taylors would be discontinued when the procedures for relocating a site have been completed.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 4.4 | FRM Gravimetric | 1:1 |
| Collocated $PM_{2.5}$ | Neighbor-hood | Population Exposure | QA Collocated | 4.4 | FRM Gravimetric | 1:6 |

DRAFT

**Greenville Employment Security Commission (ESC)**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville-Mauldin-Easley MSA
**AQS Site ID:** 45-045-0015
**Location:** 101 Perry Avenue
**County:** Greenville
**Coordinates:** +34.853985, -82.412754
**Date Established:** April 11, 2008
**Site Evaluation:** pending (QA Check: May 02, 2008).

---

This site was established on 4/11/2008. This site also supports continuous $PM_{2.5}$, $PM_{10}$, Sulfur Dioxide, Nitrogen Dioxide, Carbon Monoxide, Sulfate, Black Carbon, and measurements for wind speed and wind direction. The sample inlets are 15.0 meters from the nearest road.

Changes for 2011:

Pending the final revision to the lead monitoring requirements, lead sampling at this site may be terminated. The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

(Table continues on next page)

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure / Welfare Related Impacts | SLAMS | 4.4 | FRM Gravimetric | 1:1 |
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM Non-regulatory | 4.0 | TEOM | Continuous |
| Speciated $PM_{2.5}$ | Neighbor-hood | Population Exposure | Supplement-ary speciation | 4.5 | STN Protocol | 1:6 |
| $PM_{10}$ | Neighbor-hood | Population Exposure | SLAMS | 4.0 | FEM TEOM | Continuous |
| Lead | Neighbor-hood | Population Exposure | SPM | 2.4 | ICP | 1:6 |

DRAFT

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Sulfur Dioxide | Neighbor-hood | Population Exposure | SPM | 4.0 | FEM UV fluorescence | Continuous |
| Nitrogen Dioxide | Neighbor-hood | Population Exposure / General Background | SPM | 4.0 | FRM Chemiluminescence | Continuous |
| Carbon Monoxide | Middle | Max Precursor Impact | SPM | 4.0 | FRM Nondispersive Infrared Photometry | Continuous |
| Sulfate | Neighbor-hood | Population Exposure / General Background | Non-regulatory | 4.5 | Catalytic thermal reduction / Pulsed fluorescence | Continuous |
| Black Carbon | Neighbor-hood | Population Exposure / General Background | Non-regulatory | 4.5 | Optical absorption | Continuous |
| Wind Speed / Direction | Neighbor-hood | Local Conditions | Not applicable | 10 | Instruments for wind speed and wind direction | Continuous |

DRAFT

**Hillcrest Middle School**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville-Mauldin-Easley MSA
**AQS Site ID:** 45-045-0016
**Location:** 510 Garrison Road
**County:** Greenville
**Coordinates**: 34.752, -82.257
**Date Established:** February 17, 2009
**Site Evaluation:** pending (QA Check: September 15, 2009).

---

This site will serve as one of the two required ozone monitors in the Greenville MSA. It is expected that this site will represent the ozone concentrations near populated areas in southern Greenville County.

Changes for 2011:

The Department will begin sampling for $PM_{2.5}$ at this location to evaluate it as a potential site representative of suburban $PM_{2.5}$ concentrations in the Greenville-Mauldin-Easley MSA. Once the evaluation is complete the Department will determine if Hillcrest is an appropriate location for $PM_{2.5}$ sampling to represent the area.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Population Exposure | SLAMS | 2 | FEM Ultraviolet Photometry | Continuous |
| †$PM_{2.5}$ | Neighborhood | Population Exposure | SPM | Not available | FRM Gravimetric | 1:1 |

DRAFT

**Famoda Farms**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville-Mauldin-Easley MSA
**AQS Site ID:** 45-045-1003
**Location:** 7560 Mountain View Road
**County:** Greenville
**Coordinates:** 35.057, -82.373
**Date Established:** August 7, 2008
**Site Evaluation:** pending (QA Check: October 05, 2009).

---

This site serves as one of the two required ozone monitors in the Greenville MSA. It is expected that this site will represent the maximum ozone concentration for the Greenville MSA.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration | SLAMS | 2.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

## Long Creek

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA
**AQS Site ID:** 45-073-0001
**Location:** Round Mt. Fire Tower
**County:** Oconee
**Coordinates:** +34.805261, -83.237700
**Date Established:** August 1, 1983
**Site Evaluation:** The most recent site evaluation was conducted on February 18, 2005 (QA Check: March 18, 2008).

---

The Long Creek monitoring site is located on Round Mountain in northwest Oconee County. The Long Creek site was established as part of the Southern Oxidant Study. It provides a unique vantage for monitoring the impacts of transported pollutants. Long Creek has samplers for $PM_{2.5}$ and acid rain and has continuous monitors for $O_3$, $PM_{2.5}$, $SO_2$, and precipitation. The sample inlets are 11.0 meters from the nearest road.

Due to the importance of measuring region-wide $SO_2$, $PM_{2.5}$ and ozone concentrations, the unique location and collocated monitoring activity, the Department has determined that current monitoring at this site should be continued.

Changes for 2011:

The Department intends to continue to work with the land-owner to improve site exposure due to recent tree growth around the site.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Urban | General / Background | SLAMS | 2.6 | FRM Gravimetric | 1:3 |
| $PM_{2.5}$ | Urban | General / Background | SPM Non-regulatory | 4.3 | TEOM 50°C | Continuous |
| Ozone | Regional | General / Background | SPM | 4.3 | FEM Ultraviolet Photometry | Continuous |
| Sulfur Dioxide | Regional | Regional Transport | SPM | 4.3 | FEM UV fluorescence | Continuous |
| Acid Rain | Neighbor-hood | Trends | SPM | 1.5 | IC | 1 week samples Tue-Tue |
| Precipitation | Neighbor-hood | Local Conditions | Non-regulatory | 1.5 | Tipping bucket | Continuous |

DRAFT

**Clemson CMS**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville-Mauldin-Easley MSA
**AQS Site ID:** 45-077-0002
**Location:** 106 Hope Well Road
**County:** Pickens
**Coordinates:** +34.653606, -82.838659
**Date Established:** July 14, 1979
**Site Evaluation:** The most recent site evaluation was conducted on March 18, 2003 (QA Check: March 18, 2008).

---

The Clemson Continuous Monitoring Site (CMS) site is located on the grounds of Clemson University near the western border of Pickens County. This monitor was intended to document ozone concentrations upwind of the Greenville-Spartanburg urbanized area. The sample inlets are 27.4 meters from the nearest road.

Changes for 2011:

The Department continues to discuss with stakeholders if an alternative site that will better meet area monitoring objectives and represent Pickens County should be sought. If it is deemed appropriate to establish an alternative site, the Department will collect at least one year of monitoring data concurrent with the new site and assess the results before recommending relocation of ozone monitoring.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | General background | SLAMS | 3.5 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**North Spartanburg Fire Station #2**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA
**AQS Site ID:** 45-083-0009
**Location:** 1556 John Dodd Road
**County:** Spartanburg
**Coordinates:** +34.988706, -82.075802
**Date Established:** April 4, 1990
**Site Evaluation:** The most recent site evaluation was conducted on June 8, 2006 (QA Check: May 02, 2008).

---

This monitoring site is located in rural Spartanburg County, northwest of the city of Spartanburg. This site was established as a maximum ozone concentration monitor for the Greenville-Spartanburg-Anderson urban area on 04/04/1990. This monitor is designated SLAMS and fulfills the requirement for a maximum concentration site for the Spartanburg MSA.

The sample inlets are 85.0 meters from the nearest road.

No Changes for 2011:

No changes are planned at this monitoring site.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration | SLAMS | 3.6 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**T.K. Gregg Recreation Center**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA
**AQS Site ID:** 45-083-0011
**Location:** 267 Northview Street
**County:** Spartanburg
**Coordinates**: 34.956, -81.925
**Date Established:** December 29, 2008
**Site Evaluation:** pending (QA Check: September 16, 2009).

---

With the cooperation of local government and stakeholders, the Department has established this $PM_{2.5}$ site in the downtown Spartanburg area to meet the 40 CFR Part 58 Appendix D requirements for monitoring objective and collocated continuous monitoring and reporting. T.K. Gregg was operated concurrently with the Westview site for a year. This site also supports the required collocated $PM_{2.5}$ continuous monitor for the Spartanburg MSA.

Changes for 2011:

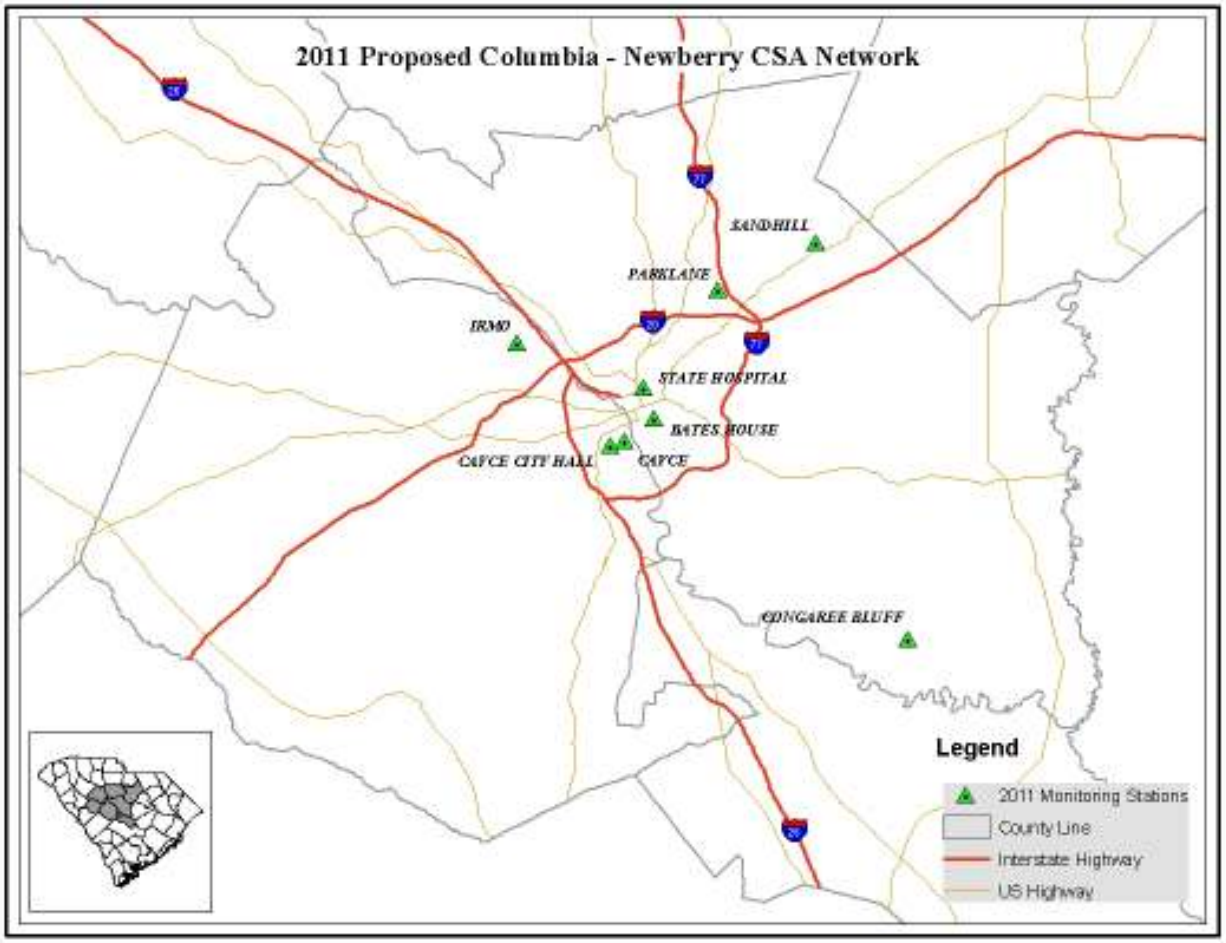
The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Highest Concentration | SLAMS | 2.5 | FRM Gravimetric | 1:1 |
| $PM_{2.5}$ | Neighbor-hood | Highest Concentration | SPM Non-regulatory | 3.0 | TEOM | Continuous |

DRAFT

**Columbia-Newberry CSA**



Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOC | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-063-0008 | Irmo | ● | ○ | | | | | | ○ | | | | ○ | ○ | ○ | | | | |
| 45-063-0009 | Cayce CMS | | | | ○ | | | | | | | | | | | | | | ○ |
| 45-063-0010 | Cayce City Hall | | | | ● | | | | | | | | | | | | | | |
| 45-079-0007 | Parklane (NCore) | ● | ○ | ● | ○ | ● | ● | ● | ● | ●* | ● | | | | ○ | | | | ●** |
| 45-079-0019 | Bates House (USC) | ●● | | | ● | | ● | | | | | | | | | | | | |
| 45-079-0020 | State Hospital | | | | | | | | | | | | | ○ | ○ | | | | |
| 45-079-0021 | Congaree Bluff | | | | | | | ○ | ○ | | | | | | | | ○○ | ○ | ○ |
| 45-079-1001 | Sandhill | | | | | | | ● | | ○ | | | | | | | | | ○ |
| | TOTAL | 4 | 2 | 1 | 4 | 1 | 2 | 3 | 3 | 3 | 1 | 0 | 1 | 2 | 3 | 0 | 2 | 1 | 6 |

○ SPM / Other ●●/○○ indicates duplicate QA samplers **see details on page for number of parameters

● SLAMS/NCore *NO and $NO_y$ will be monitored

DRAFT

**Irmo**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-063-0008
**Location:** 200 Leisure Lane
**County:** Lexington
**Coordinates:** +34.051017, -81.154950
**Date Established:** April 7, 1989
**Site Evaluation:** The most recent site evaluation was conducted on February 25, 2005 (QA Check: September 14, 2009).

---

This site is located in Lexington County near the town of Irmo. The Irmo site has a sampler for $PM_{2.5}$ and continuous monitors for $SO_2$, black carbon and $PM_{2.5}$. Additionally, this site has samplers collecting carbonyl and SVOC samples on a 1:6 schedule. The sample inlets are 43.4 meters from the nearest road. The Irmo site supports the required collocated $PM_{2.5}$ continuous monitor for the MSA.

Changes for 2011:

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 5.0 | FRM Gravimetric | 1:1 |
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM Non-regulatory | 4.6 | TEOM 30°C | Continuous |
| $SO_2$ | Neighbor-hood | Source-Oriented | SPM | 3.4 | FEM UV fluorescence | Continuous |
| Black Carbon | Neighbor-hood | Population Exposure / General Background | Non-regulatory | 4.0 | Optical absorption | Continuous |
| Carbonyls | Neighbor-hood | Population Exposure | Non-regulatory | 3.9 | HPLC Ultraviolet Absorption | 1:6 |
| SVOC | Neighbor-hood | Population Exposure | Non-regulatory | 3.9 | PUF/GCMS | 1:6 |

DRAFT

**Cayce CMS**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-063-0009
**Location:** 609 Frink Street
**County:** Lexington
**Coordinates:** +33.973389, -81.052675
**Date Established:** October 26, 1991
**Site Evaluation:** The most recent site evaluation was conducted on May 8, 2006 (QA Check: September 10, 2009).

---

This site is located in Lexington County in the city of Cayce. The $PM_{10}$ is a Special Purpose Monitor and the site was established as a source-oriented monitor in an area where there is a concentration of industrial particulate sources. In addition to $PM_{10}$, Cayce CMS has instruments for measuring precipitation, wind speed and wind direction. Cayce CMS represents middle scale concentrations of $PM_{10}$ in an area dominated by point sources and dust reentrained by mobile sources. The sample inlets are 4.9 meters from the nearest road.

The data collected at this location is intended for use by the Department, local government and industry to enable quick response to the impacts of local activities to minimize emissions. While not representative of population exposure, the continued availability of the data is important to the efforts of the Department and local stakeholders to protect air quality in nearby communities.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{10}$ | Middle | Source Oriented | SPM | 4.3 | TEOM Gravimetric | Continuous |
| Wind Speed / Direction | Neighbor-hood | Local Conditions | Non-regulatory | 10 | Instruments for wind speed and wind direction | Continuous |
| Precipitation | Not applicable | General / Background | SPM | 4.2 | Not applicable | Hourly |

DRAFT

**Cayce City Hall**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-063-0010
**Location:** 1800 12th Street Extension, Cayce, SC
**County:** Lexington
**Coordinates**: 33.969, -81.066
Date Established: December 6, 2007
**Site Evaluation:** pending (QA Check: September 10, 2009).

---

Cayce City Hall was established to measure $PM_{10}$ concentrations in populated areas and to demonstrate that the occasional high concentrations observed at Cayce CMS do not impact the neighborhoods surrounding the industrialized area. Cayce City Hall is in an area dominated by area sources.

The sample inlet is 32.0 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{10}$ | Neighbor-hood | Population Exposure | SLAMS | 2.4 | TEOM | Continuous |

DRAFT

**Parklane (NCore)**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-079-0007
**Location:** 8311 Parklane Rd.
**County:** Richland
**Coordinates:** +34.093959, -80.962304
**Date Established:** April 3, 1980
**Site Evaluation:** The most recent site evaluation was conducted on March 22, 2007 (QA Check: March 13, 2008).

---

The Parklane site is located in north central Richland County. The Parklane site has samplers for acid rain and has continuous monitoring for ozone and precipitation. Additionally, the site has a sampler for semi-volatile compounds. The sample inlets are 57.0 meters from the nearest road.

The site was originally placed to provide downwind, edge of the Columbia urban area population exposure measurements. The site also provides a facility for training and equipment evaluation convenient to the Columbia DHEC air laboratory.

Changes for 2011:

This site has been approved by the USEPA as the South Carolina urban NCore site. Monitoring for all required NCore species is expected to be in operation by January 1, 2011. NCore monitoring for the criteria pollutants CO and $SO_2$ and $NO_y$ will be done with high sensitivity instruments which may not be FRM or FEM.

The EPA is currently proposing a change to the monitoring requirements for lead. This proposal would establish lead sampling at NCore sites. The Department is adding lead to the list of monitoring to be done at Parklane in anticipation of this proposed requirement becoming finalized. If EPA does not finalize this requirement, the Department will remove lead from the list of monitors below and resubmit the plan to the EPA.

Monitors:

(Table continues on next page)

| Parameter **Required** | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| **$PM_{2.5}$** | Neighbor -hood | Population Exposure | NCore | 5 | FRM Gravimetric | 1:3 |
| **$PM_{2.5}$** | Neighbor -hood | Population Exposure | SPM Non-regulatory | 4.4 | TEOM | Continuous |
| **$PM_{2.5}$ Speciated** | Neighbor -hood | Population Exposure | NCore | 3 | Energy dispersive XRF, Ion chromatogra phy, STN | 1:3 |

DRAFT

| Parameter **Required** | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| | | | | | TOT | |
| **$PM_{10-2.5}$** | Neighbor-hood | Population Exposure | NCore | 4.4 | TEOM | Continuous |
| $PM_{10}$ | Neighbor-hood | Population Exposure | SPM | 4.4 | TEOM | Continuous |
| **Ozone** | Urban | Max Ozone Concentration | NCore | 4.4 | FEM Ultraviolet Photometry | Continuous |
| **$SO_2$** | Neighbor-hood | Population Exposure | NCore | 4.4 | UV Florescence | Continuous |
| **CO** | Neighbor-hood | Population Exposure | NCore | 4.4 | Nondispersive Infrared | Continuous |
| **NO** | Neighbor-hood | Population Exposure | NCore | 10 | Chemiluminesence | Continuous |
| **NOy** | Neighbor-hood | Population Exposure | NCore | 10 | Chemiluminesence | Continuous |
| Lead* | Neighbor-hood | Population Exposure | NCore | 2.5 | High Volume FRM | 1:6 |
| SVOC | Neighbor-hood | Population Exposure | SPM | 2.5 | PUF-GC/MS | 1:6 |
| **Surface meteorology** | Neighbor-hood | Local Conditions | Not applicable | 1 | Not applicable | Continuous |
| Precipitation | Neighbor-hood | Local Conditions | Not applicable | 1 | Not applicable | Continuous |
| Precipitation chemistry | Neighbor-hood | Local Conditions | Not applicable | 1 | Not applicable | Weekly sample |
| *proposed requirement | | | | | | |

DRAFT

**Bates House (USC)**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-079-0019
**Location:** 323 S. Bull Street
**County:** Richland
**Coordinates:** +33.991509, -81.024141
**Date Established:** November 24, 1998
**Site Evaluation:** The most recent site evaluation was conducted on March 17, 2003 (QA Check: September 14, 2009).

---

The Bates House (USC) site is located in Richland County on the University of South Carolina (USC)-Columbia campus. The Bates House site has a sampler for $PM_{2.5}$. Additionally, this site has collocated precision sampling for $PM_{2.5}$. The sample inlets are 28.8 meters from the nearest road.

A continuous $PM_{10}$ sampler was installed in late 2005 as an element of the USC Particulate Study adding more timely information to the public than was available from the SLAMS $PM_{10}$ sampler. The continuous data was intended to provide more detailed information to establish baseline and measurement of potential impacts of a new biomass facility. The continuous monitor has replaced the filter sampling as the SLAMS monitor. The site has collocated wind measurement equipment (3m) operated by the USC Geography Department.

Changes for 2011:

Pending the final revision to the lead monitoring requirements, lead sampling at this site may be terminated.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 2.3 | FRM Gravimetric | 1:1 |
| Collocated $PM_{2.5}$ | Neighbor-hood | Quality Assurance | QA Collocated | 2.3 | Gravimetric | 1:6 |
| $PM_{10}$ | Neighbor-hood | Population Exposure | SLAMS | 3.1 | TEOM | Continuous |
| Lead | Neighbor-hood | Population Exposure | SLAMS | 1.3 | ICP | 1:6 |

DRAFT

**State Hospital**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-079-0020
**Location:** 2100 Bull Street
**County:** Richland
**Coordinates:** +34.015494, -81.034179
**Date Established:** January 7, 1999
**Site Evaluation:** The most recent site evaluation was conducted on February 9, 2006.

---

The State Hospital site is located in Columbia near the intersection of Elmwood Avenue and Bull Street on the grounds of the South Carolina State Hospital. State Hospital has samplers for carbonyls and semi-volatile organic compounds. The sample inlets are 10.0 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011. Access to this site may be lost subject to pending sale and proposed use of the property.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Carbonyls | Neighbor-hood | General / Background | Non-regulatory | 3.9 | HPLC Ultraviolet Absorption | 1:6 |
| SVOC | Neighbor-hood | General / Background | Non-regulatory | 5.0 | PUF-GC/MS | 1:6 |

DRAFT

## Congaree Bluff

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-079-0021
**Location:** 1850 South Cedar Creek Road
**County:** Richland
**Coordinates:** +33.814680, -80.781135
**Date Established:** December 27, 1999
**Site Evaluation:** The most recent site evaluation was conducted on April 11, 2005 (QA Check: March 13, 2008).

---

The Congaree Bluff site is located in southern Richland County. The site is located in a rural setting within the boundaries of the Congaree National Park. The Congaree Bluff site has monitors for ozone, $SO_2$, mercury vapor and precipitation. Congaree Bluff also has samplers for mercury deposition and acid rain. The sample inlets are 191.7 meters from the nearest road.

The Congaree Bluff monitoring continues a data record begun in 1981 with the establishment of the Congaree Swamp site (45-079-1006). The original site was established in cooperation with the Department of the Interior and the support of the General Assembly to provide long term monitoring in this unique area. The Congaree Swamp site in the flood plain was relocated to the current Congaree Bluff site in 2001.

The National Park Service collects wind data on a collocated 30 meter wind tower.

Changes for 2011:

There are no changes planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | General / Background | SPM | 4.4 | FEM Ultraviolet Photometry | Continuous |
| $SO_2$ | Urban | General / Background | SPM | 4.4 | FEM UV Fluorescence | Continuous |
| Mercury (vapor) | Urban | Source Oriented | Non-regulatory | 4.4 | Cold Vapor Atomic Fluorescence | Continuous |
| Mercury Deposition | Urban | Source Oriented | NADP-MDN | 1.5 | MDN protocol | Weekly samples |
| Acid Rain | Regional | Regional Transport | Non-regulatory | 1.5 | IC | 1 Week Tue-Tue |
| Precipitation | Neighbor-hood | Local Conditions | Non-regulatory | 1.5 | Tipping Bucket | Continuous |

DRAFT

**Sandhill Experimental Station**
**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA
**AQS Site ID:** 45-079-1001
**Location:** 900 Clemson Road
**County:** Richland
**Coordinates:** +34.131262, -80.868318
**Date Established:** January 1, 1959
**Site Evaluation:** The most recent site evaluation was conducted on July 1, 2002 (QA Check: March 13, 2008).

---

The Sandhill Experimental Station site is located in northeastern Richland County, downwind from the Columbia metropolitan area. This site is located in a rapidly urbanizing portion of the city of Columbia. The Sandhill site measures $PM_{2.5}$, $NO_2$, Ozone, wind direction, and wind speed.

The sample inlets are 33.5 meters from the nearest road.

Changes for 2011:

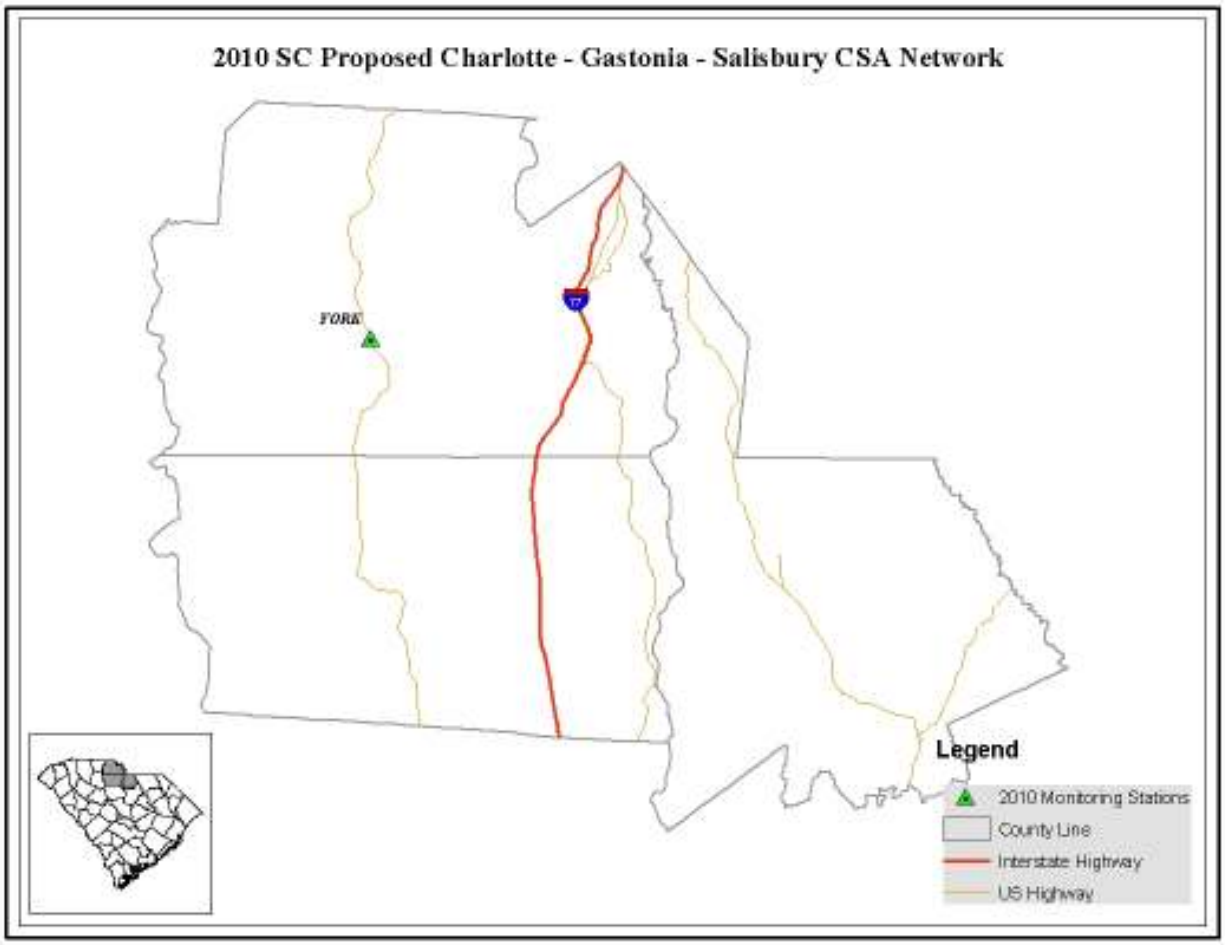
There are no changes planned in 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration | SLAMS | 4.3 | FEM Ultraviolet Photometry | Continuous |
| $NO_2$ | Urban | General / Background Max Precursor Emissions Impact | SPM | 4.3 | FRM Chemiluminescence | Continuous |
| Wind Speed / Direction | Neighbor-hood | Local Conditions | Non-regulatory | 10.0 | Instruments for wind speed and wind direction | Continuous |

DRAFT

**Charlotte-Gastonia-Salisbury CSA (part)**




Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-091-0006 | York CMS | | | | | | | ● | | | | | | | | | | | ○ |
| | TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA monitors

## York CMS

**CSA/MSA:** Charlotte-Gastonia-Salisbury CSA / Charlotte-Gastonia-Concord MSA
**AQS Site ID:** 45-091-0006
**Location:** 2316 Chester Highway (US 321)
**County:** York
**Coordinates:** +34.935817, -81.228409
**Date Established:** March 30, 1993
**Site Evaluation:** The most recent site evaluation was conducted on June 13, 2006 (QA Check: May 02, 2008).

---

The York CMS site is located in south-central York County. The site was established to represent background levels near the Charlotte urban area. This monitor is located in a rural setting to support Charlotte-Rock Hill reporting and forecasting. The sample inlets are 171.4 meters from the nearest road.

This site is important for forecasting ozone concentrations in the Charlotte Metropolitan area. Additionally, the long historical record and location of the site make the data useful to both North and South Carolina Air Programs. In addition to measuring ozone, the York site also measures wind speed and wind direction.

Changes for 2011:

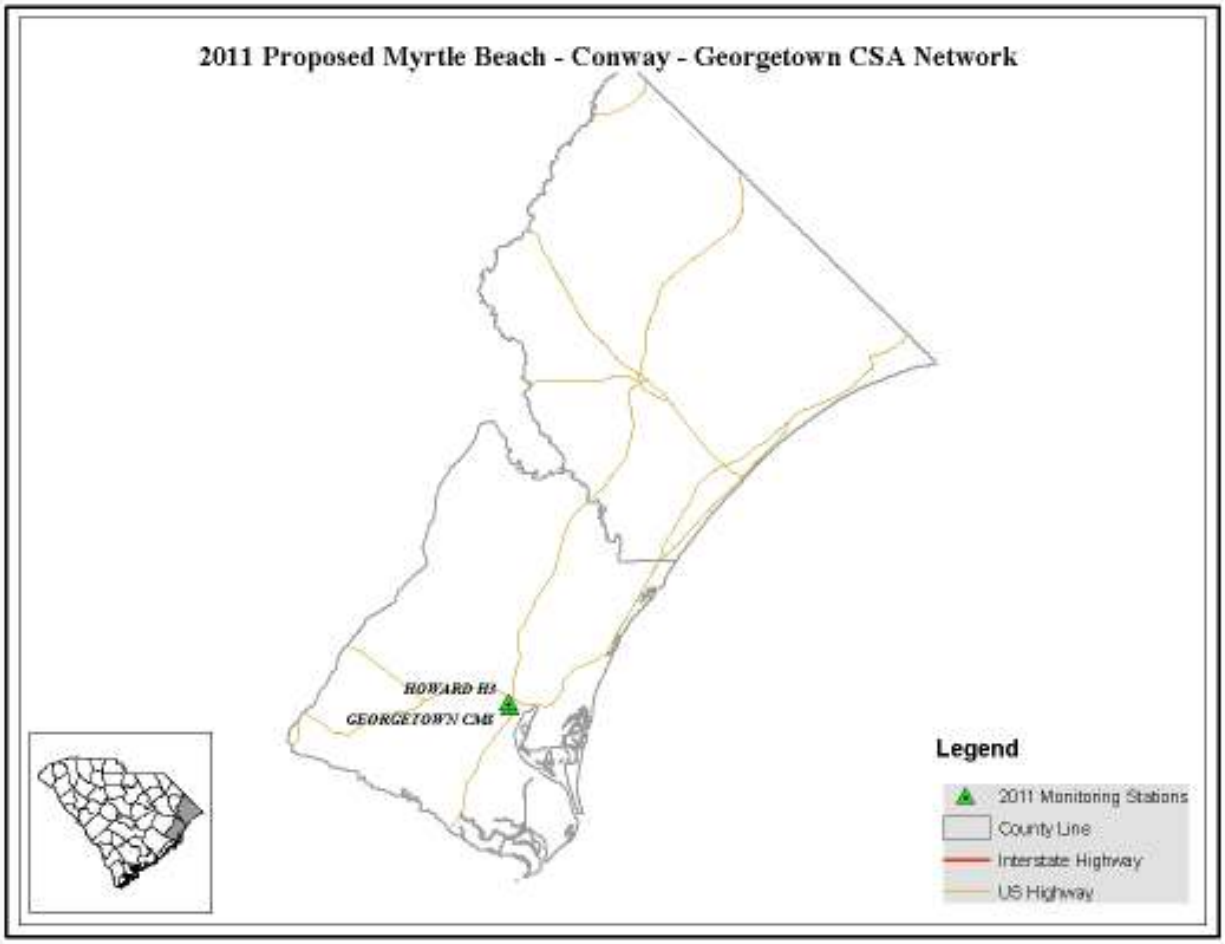
No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Upwind Background | SLAMS | 3.3 | FEM Ultraviolet Photometry | Continuous |
| Wind Speed / Direction | Neighbor-hood | Local Conditions | Non-regulatory | 10.0 | Instruments for wind speed, wind direction. | Continuous |

DRAFT

**Myrtle Beach-Conway-Georgetown CSA**




Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-043-0006 | Georgetown CMS | | | | | | | | | | | | | | | | | | ○○ |
| 45-043-0011 | Howard High School #3 | | | | ○ | | | | | | | | | | | | | | |
| | TOTAL | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA monitors

**Georgetown CMS**
**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA
**AQS Site ID:** 45-043-0006
**Location:** 1369 Dock Street
**County:** Georgetown
**Coordinates:** +33.362014, -79.394251
**Date Established:** October 25, 1972
**Site Evaluation:** The most recent site evaluation was conducted on April 2, 2007.

---

The Georgetown CMS site is located in Georgetown County. Georgetown CMS is located in an industrial area dominated by point sources and is not intended to represent $PM_{10}$ concentrations in populated areas. The sample inlets are 21 meters from the nearest road.

The site is in very close proximity to several local sources (e.g., truck parking, material handling and road dust), and is not near inhabited buildings or locations where the general public can be expected to have access. The data collected at this location is intended for use by the Department, local government and industry to enable quick response to the impacts of local activities to minimize emissions. While not representative of population exposure, the continued availability of the data is important to the efforts of the Department and local stakeholders to protect air quality in nearby communities.

Previous monitoring in the local residential areas at the Maryville, Howard High and Winyah sites have confirmed this location is representative of no more than middle scale.

Changes for 2011:

$PM_{10}$ monitoring will be terminated in 2011. The Department will evaluate a pending revision to the monitoring requirements for the $SO_2$ NAAQS and determine if it is appropriate to reinstate monitoring at this location. The Department will evaluate the requirements of the monitoring portion of the $SO_2$ NAAQS and amend the monitoring plan if necessary.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Wind Speed/ Direction | Neighbor-hood | Local Conditions | Non-regulatory | 10.0 | Instruments for wind speed and wind direction | Continuous |
| Precipitation | Not applicable | Local Conditions | Non-regulatory | Not applicable | Tipping Bucket | Continuous |

DRAFT

**Howard High School #3**
**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA
**AQS Site ID:** 45-043-0011
**Location:** S. Kaminski Street
**County:** Georgetown
**Coordinates:** 33.369,-79.297
**Date Established**: July, 15 2008
**Site Evaluation:** pending

---

This site represents a continuation of $PM_{10}$ monitoring in this area of Georgetown that has been ongoing since 1970 and the establishment of the original Howard High site.

Changes for 2011:

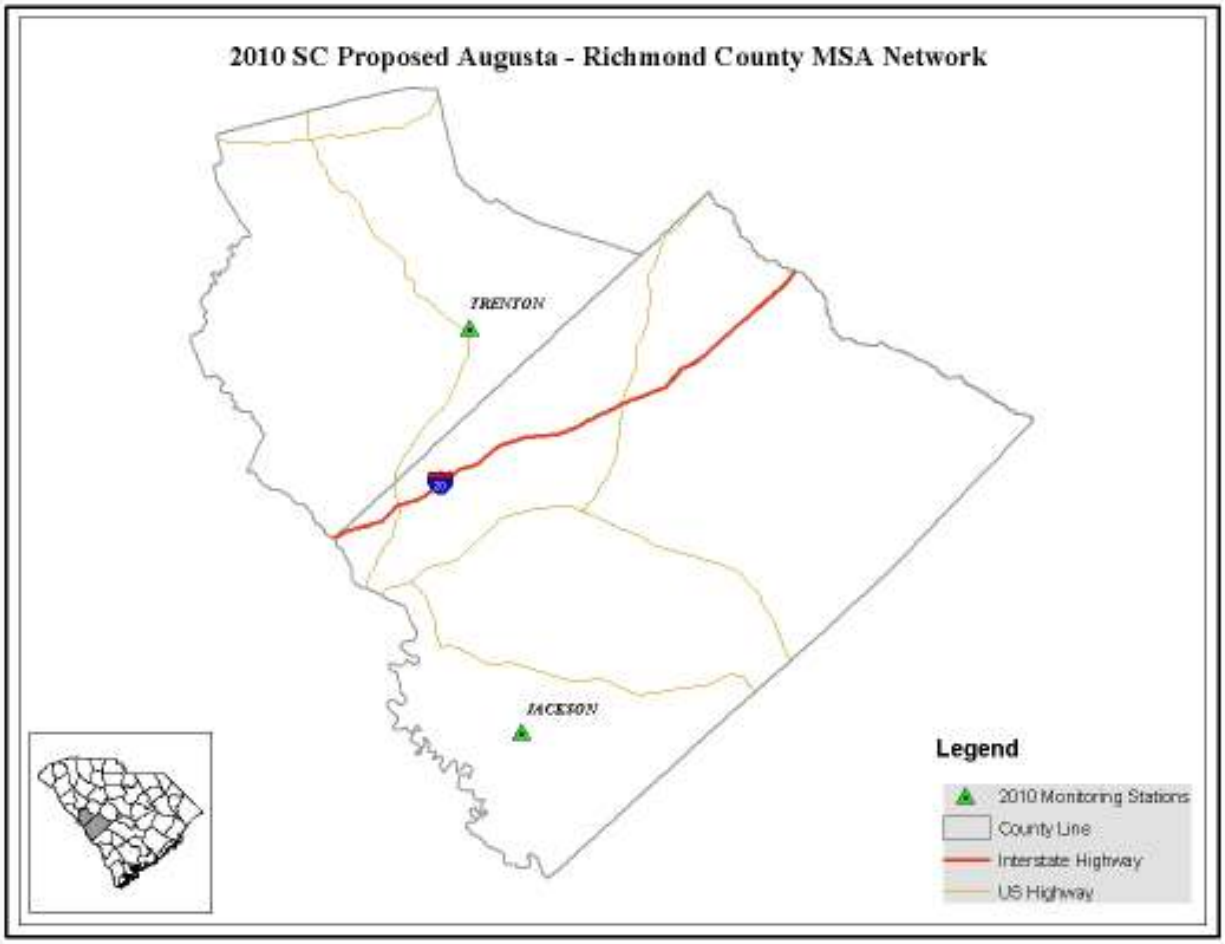
No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{10}$ | Neighbor-hood | Population Exposure Highest Concentration | SPM | 2.0 | TEOM | Continuous |

DRAFT

Augusta-Richmond County MSA (part)




Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-003-0003 | Jackson Middle School | | | | | | | ● | | | | | | | | | | | |
| 45-037-0001 | Trenton | O | O | | | | | ● | | | | | | | | | | | |
| | TOTAL | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

O SPM / Other
● SLAMS
●●/OO indicates duplicate QA monitors

**Jackson Middle School**
**CSA/MSA:** Augusta-Richmond County MSA
**AQS Site ID:** 45-003-0003
**Location:** 8217 Atomic Road
**County:** Aiken
**Coordinates:** +33.342226, -81.788731
**Date Established:** October 24, 1985
**Site Evaluation:** The most recent site evaluation was conducted on June 14, 2006 (QA Check: April 07, 2008).

---

The Jackson Middle School site is located in southwestern Aiken County at the Jackson Middle School. Jackson is located in a suburban setting to monitor concentrations upwind of the Augusta urbanized area. The sample inlet is 138.8 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Upwind Background | SLAMS | 4.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Trenton**
**CSA/MSA:** Augusta-Richmond County MSA
**AQS Site ID:** 45-037-0001
**Location:** 660 Woodyard Road (Hwy 121)
**County:** Edgefield
**Coordinates:** +33.739963, -81.853635
**Date Established:** March 28, 1980
**Site Evaluation:** The most recent site evaluation was conducted on March 18, 2003 (QA Check: April 07, 2008).

---

The Trenton site is located in southeastern Edgefield County. Trenton was originally placed in this area to monitor for ozone crossing into South Carolina from Georgia. The Trenton site has both FRM and continuous monitoring for $PM_{2.5}$. The sample inlets are 39.4 meters from the nearest road.

Changes for 2011:

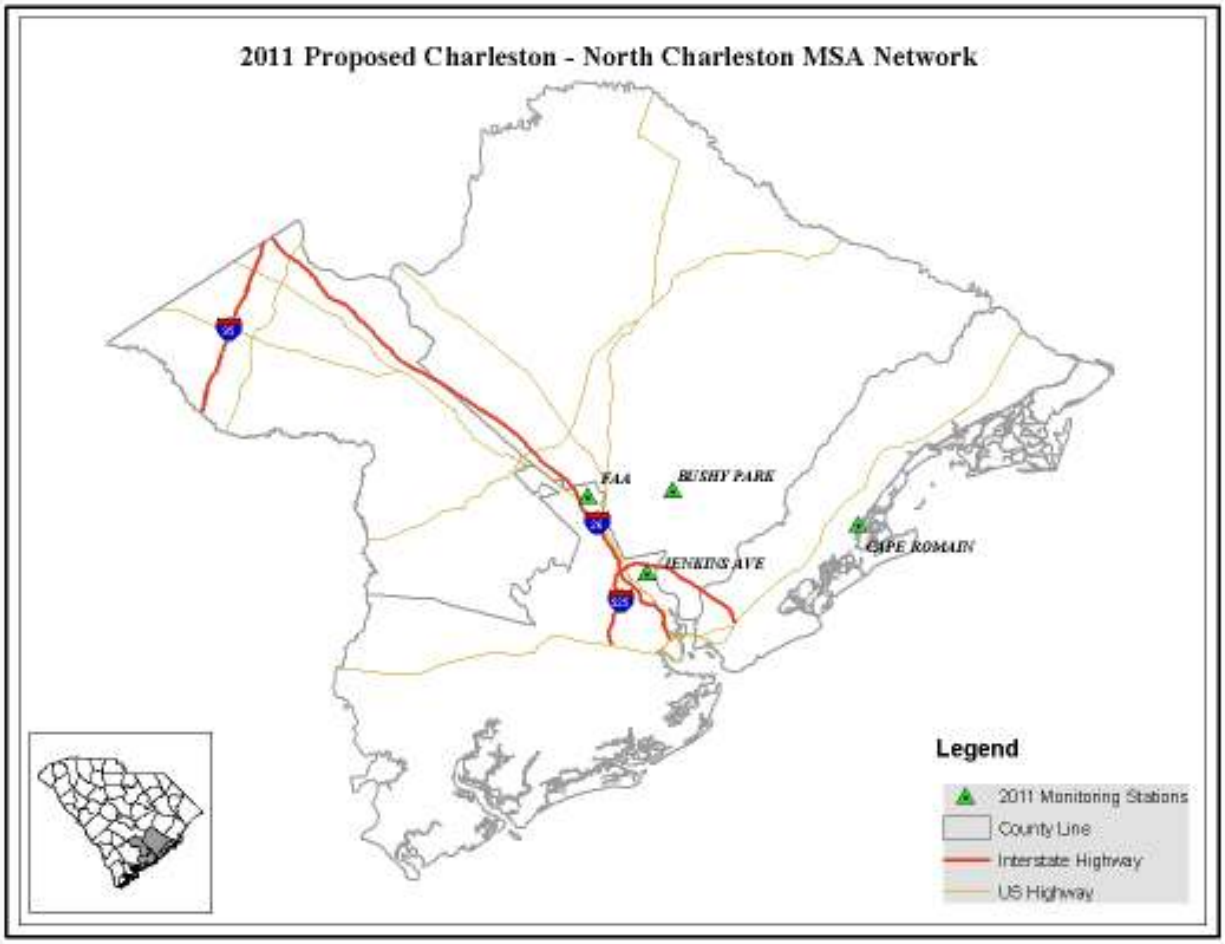
The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Urban | Extreme Downwind | SPM | 4.5 | Gravimetric | 1:3 |
| Continuous $PM_{2.5}$ | Urban | Extreme Downwind | SPM Non-regulatory | 1.8 | TEOM 50°C | Continuous |
| Ozone | Urban | Highest Concentration / Extreme Downwind | SLAMS | 3.6 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Charleston-North Charleston MSA**




Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-015-0002 | Bushy Park Pump Station | | | | | | | ● | | | | | | | | | | | |
| 45-019-0003 | Jenkins Ave. Fire Station | | | | ● | | ● | | ○ | ○ | | | | | | | | | |
| 45-019-0046 | Cape Romain | | ○ | ○ | | | | ● | ○ | ○ | ○ | ○ | ○ | | | | | | ○ |
| 45-019-0048 | FAA | ○○ | | | | | | | | | | | | | | | | | |
| 45-019-0049 | CPW | ● | ○ | | | | | | | | | | | | | | | | |
| 45-019-xxxx | North Charleston | ● | ● | | | | | | | | | | | | | | | | |
| | TOTAL | 4 | 3 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

○ SPM / Other ● SLAMS
●●/○○ indicates duplicate QA monitors

**Bushy Park Pump Station**
**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-015-0002
**Location:** 1530 Bushy Park Road (Goose Creek)
**County:** Berkeley
**Coordinates:** +32.987252, -79.936700
**Date Established:** June 20, 1978
**Site Evaluation:** The most recent site evaluation was conducted on March 17, 2003 (QA Check: March 19, 2008).

---

The Bushy Park Pump Station site is located in southeastern Berkeley County downwind from the Charleston urban area. The sample inlets are 11.3 meters from the nearest road.

Changes for 2011:

Within the next 18-months, the Department intends to search for an alternative maximum ozone concentration monitoring site for the Charleston-North Charleston MSA to better meet monitoring objectives.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration | SLAMS | 3.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Jenkins Ave. Fire Station**
**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-019-0003
**Location:** 4830 Jenkins Ave.
**County:** Charleston
**Coordinates:** +32.882289, -79.977538
**Date Established:** February 14, 1969
**Site Evaluation:** The most recent site evaluation was conducted on March 2, 2005 (QA Check: September 24, 2009).

---

The Jenkins Ave. Fire Station site is located in the city of North Charleston. The site is located in an urban and center city setting. The Jenkins Ave. Fire Station site supports monitors for $PM_{10}$, $SO_2$, and $NO_2$. The sample inlets are 9.6 meters from the nearest road.

Changes for 2011:

Pending the outcome of a proposed final revision to the lead monitoring requirements, lead sampling at this site may be terminated.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{10}$ | Neighbor-hood | Highest Concentration | SLAMS | 4.3 | FEM TEOM | Continuous |
| Lead | Neighbor-hood | Population Exposure | SLAMS | 3.8 | ICP | 1:6 |
| $SO_2$ | Neighbor-hood | Population Exposure | SPM | 4.3 | FEM UV Fluorescence | Continuous |
| $NO_2$ | Neighbor-hood | Highest Concentration Source Oriented | SPM | 4.3 | FRM Chemilumine scence | Continuous |

DRAFT

## Cape Romain

**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-019-0046
**Location:** 390 Bulls Island Road (Awendaw)
**County:** Charleston
**Coordinates:** +32.941023, -79.657187
**Date Established:** July 11, 1983
**Site Evaluation:** The most recent site evaluation was conducted on June 3, 2005 (QA Check: September 24, 2009).

---

The Cape Romain site is located in Charleston County at the Cape Romain National Wildlife Refuge (NWR) near Moores Landing.

The Cape Romain NWR is a Class I area about 20 miles northeast of Charleston. The majority of the Refuge area is offshore extending from Bull Island 20 miles northeast to Cape Romain. The Refuge is bordered on the west by the Intracoastal Waterway. Inland are large tracts of forests with scattered residences. Several miles inland, a primary coastal route, US Highway 17, parallels the coast, with some development along the section of highway that is closest to the Refuge.

The Cape Romain site has samplers for $PM_{2.5}$ speciation and continuous monitors for CO, $SO_2$, $NO_2$, ozone, black carbon, meteorological parameters, and $PM_{2.5}$. The sample inlets are 18 meters from the nearest road.

The Cape Roman site is collocated with the Interagency Monitoring of Protected Visual Environments (IMPROVE) sampling site and nearby monitoring performed by other agencies includes precipitation chemistry and mercury deposition. The site has been used for multiple interagency and regional air monitoring projects.

Changes for 2011:

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

(Table continues on next page)

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Urban | General Background | SPM Non-regulatory | 3.0 | TEOM 30°C | Continuous |
| Speciated $PM_{2.5}$ | Urban | Visibility | IMPROVE | 3.0 | IMPROVE protocol | 1:3 |
| Ozone | Regional | General Background | SLAMS | 4.0 | FEM Ultraviolet Photometry | Continuous |
| $SO_2$ | Regional | Source | SPM | 4.0 | FEM UV | Continuous |

DRAFT

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| | | Oriented | | | Fluorescence | |
| $NO_2$ | Regional | General Background | SPM | 4.0 | FRM Chemiluminescence | Continuous |
| CO | Urban | General Background | SPM | 4.0 | FRM Nondispersive Infrared | Continuous |
| Sulfate | Regional | General Background | Non-regulatory | 4.0 | Catalytic thermal reduction / Pulsed fluorescence | Continuous |
| Black Carbon | Regional | General Background | Non-regulatory | 4.0 | Optical absorption | Continuous |
| Wind Speed / Direction | Neighbor-hood | Local Conditions | Non-regulatory | 10.0 | Instruments for wind speed, and direction and precipitation | Continuous |

DRAFT

**FAA**
**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-019-0048
**Location:** 2670 Elms Plantation Blvd
**County:** Charleston
**Coordinates:** +32.980254, -80.065010
**Date Established:** April 9, 1999
**Site Evaluation:** The most recent site evaluation was conducted on May 4, 2006 (QA Check: September 24, 2009).

---

The Charleston FAA Beacon site is located in Charleston County approximately five miles northwest of the Charleston International Airport near Charleston Southern University. This site has collocated $PM_{2.5}$ samplers. The sample inlets are 50 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM | 2.3 | FRM Gravimetric | 1:1 |
| Collocated $PM_{2.5}$ | Neighbor-hood | Population Exposure | QA Collocated | 2.3 | FRM Gravimetric | 1:6 |

DRAFT

**Charleston Public Works**
**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-019-0049
**Location:** 360 Fishburne Street
**County:** Charleston
**Coordinates:** +32.790984, -79.958694
**Date Established:** November 20, 1998
**Site Evaluation:** The most recent site evaluation was conducted on April 24, 2006. (QA Check: September 24, 2009).

---

The Charleston Public Works (CPW) site is located on the western side of the Charleston peninsula near downtown Charleston. In addition to the $PM_{2.5}$ sampler, CPW has a $PM_{2.5}$ speciation sampler that is the South Carolina station for the national Speciation Trends Network (STN). The CPW site supports the required collocated $PM_{2.5}$ continuous monitor for the MSA. The sample inlets are 28 meters from the nearest road.

Recent measurements of $PM_{2.5}$ concentrations in the Charleston Neck/North Charleston area[7] indicate relatively higher concentrations than measured at both FAA and CPW.

Changes for 2011:

Within the next 18-months the Department will work with local stakeholders to establish an alternative site in the Charleston Neck/North Charleston area. Once an appropriate location has been found, the Department will collect at least one year of monitoring data concurrent with the new site and assess the results before recommending relocation of $PM_{2.5}$ sampling and monitoring.

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 2.4 | Gravimetric | 1:1 |
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM Non-regulatory | 3.0 | TEOM | Continuous |

[7] http://www.dhec.sc.gov/environment/baq/CharlestonNeckStudy.aspx

DRAFT

**North Charleston $PM_{2.5}$ SPM Site**
**CSA/MSA:** Charleston-North Charleston MSA
**AQS Site ID:** 45-019-xxxx
**Location:** TBD
**County:** Charleston
**Coordinates:**
**Date Established:**
**Site Evaluation:**

---

No picture available.

Recent measurements of $PM_{2.5}$ in the Charleston Neck/North Charleston area[7] indicate a need to better understand the distribution of concentrations and population exposure in areas that have not been monitored in the past. A North Charleston site will be established to provide data representative of the area exposure and monitor possible changes related to changes in industry, transportation and land use.

Once sufficient data has been collected, further evaluation of the appropriate monitoring network for the Charleston-North Charleston MSA will be conducted.

Changes for 2011:

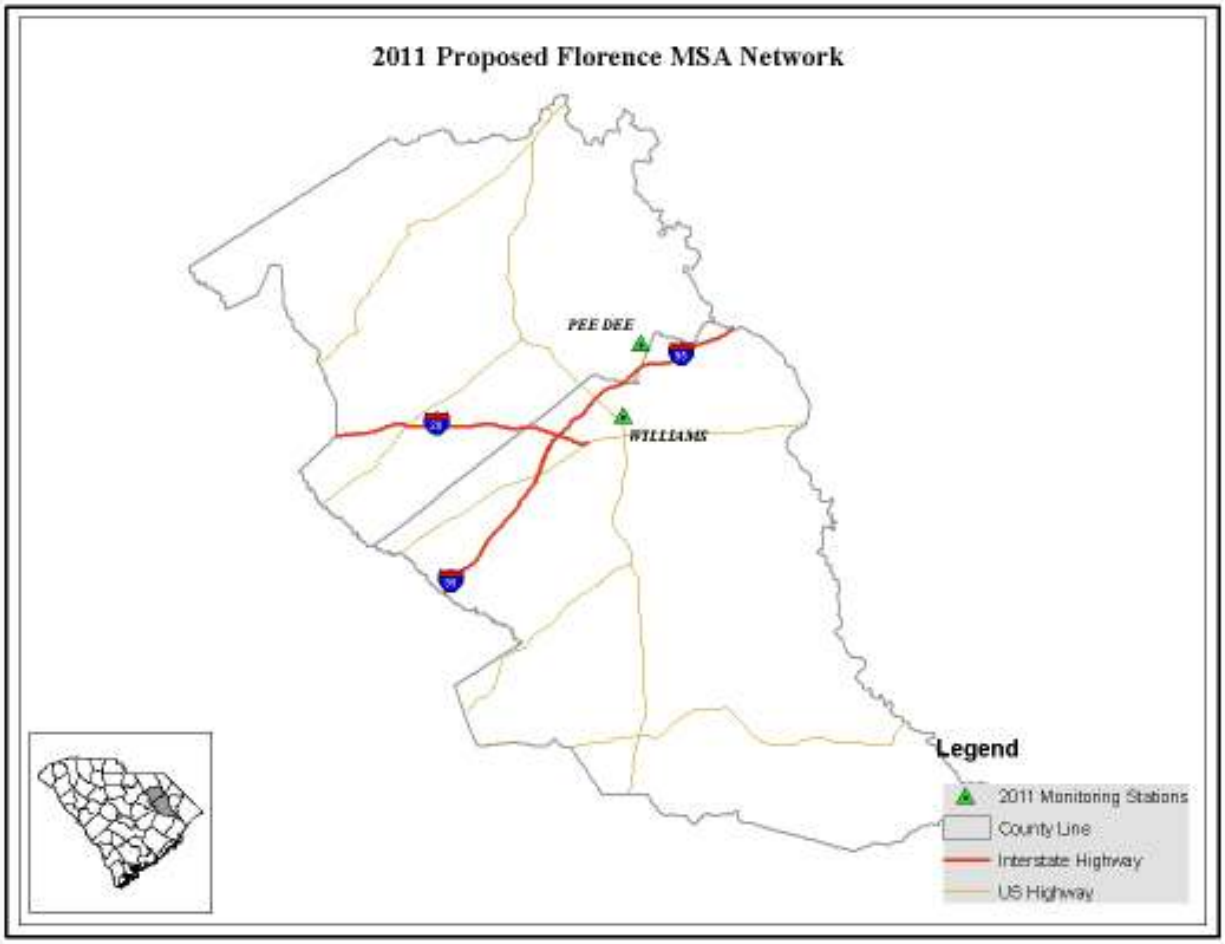
Establish site with cooperation of Municipality, community and Port Authority.

Monitors: (Proposed)

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| †$PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM | TBD | TBD | TBD |
| †Black Carbon | Neighbor-hood | Source Impact | Non-regulatory | TBD | Optical absorption | Continuous |

DRAFT

**Florence MSA**




Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10-2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-031-0003 | Pee Dee Exp. Station | | | | | | | ● | | | | | | | | | | | |
| 45-041-0003 | Williams Middle School | ● | ○ | | | | | | | | | | | | | | | | |
| | TOTAL | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA monitors

**Pee Dee Experimental Station**
**CSA/MSA:** Florence MSA
**AQS Site ID:** 45-031-0003
**Location:** 2200 Pocket Road (Darlington)
**County:** Darlington
**Coordinates:** +34.285696, -79.744859
**Date Established:** February 25, 1993
**Site Evaluation:** The most recent site evaluation was conducted on March 14, 2006 (QA Check: March 20, 2008).

---

The Pee Dee Experimental Station site is located in northeastern Darlington County. This site serves as the required ozone monitor in the Florence MSA. The sample inlets are 91 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | Max Ozone Concentration | SLAMS | 3.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Williams Middle School**
**CSA/MSA:** Florence MSA
**AQS Site ID:** 45-041-0003
**Location:** 1119 N. Irby Street
**County:** Florence
**Coordinates:** 34.214, -79.767
**Date Established**: August 4, 2008
**Site Evaluation:** pending (QA Check: September 22, 2009).

---

The Florence MSA requires one $PM_{2.5}$ sampler in a population oriented area of expected maximum concentration. A collocated continuous monitor is also required to provide timely reporting of concentrations to the public.

The Department established the Williams site to meet the 40 CFR Part 58 Appendix D requirements for objective and collocated continuous monitoring and reporting.

Changes for 2011:

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure Highest Concentration | SLAMS | 2.5 | FRM Gravimetric | 1:3 |
| $PM_{2.5}$ | Neighbor-hood | Population Exposure Highest Concentration | SPM Non-regulatory | 3.0 | TEOM | Continuous |

DRAFT

**Remainder of State**

Classification of monitoring type by site

| AIRS ID | Site Name | $PM_{2.5}$ | $PM_{2.5}$ Cont. | Speciation | $PM_{10}$ | $PM_{10\text{-}2.5}$ | Lead | $O_3$ | $SO_2$ | $NO_2$ | CO | Sulfate | BC | Carbonyls | SVOC | VOCs | Mercury | Acid Rain | MET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45-001-0001 | Due West | | | | | | | ● | | | | | | | | | | ○ | ○ |
| 45-025-0001 | Chesterfield | ● | ○ | ○ | ○○ | | | ○ | | | | | ○ | ○ | ○ | ○ | | | ○ |
| 45-029-0002 | Ashton | | ○ | | | | | ○ | | | | | | | | | | | |
| | TOTAL | 1 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 |

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA monitors

DRAFT

**Due West**
**CSA/MSA:** None
**AQS Site ID:** 45-001-0001
**Location:** 59 Jim Scott Lane
**County:** Abbeville
**Coordinates:** +34.325318, -82.386376
**Date Established:** April 2, 1991
**Site Evaluation:** The most recent site evaluation was conducted on June 27, 2006 (QA Check: April 01, 2008).

---

The Due West site is located in northeastern Abbeville County. In addition to monitoring for ozone, Due West has a monitor for precipitation and a sampler for acid precipitation.

The sample inlets are 76 meters from the nearest road.

Changes for 2011:

No changes are planned for 2011.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Ozone | Urban | General / Background | SLAMS | 4.0 | FEM Ultraviolet Photometry | Continuous |
| Acid Rain | Neighbor-hood | Trends | Non-regulatory | 1.5 | IC | Weekly |
| Precipitation | Neighbor-hood | Local Conditions | Non-regulatory | 3.0 | Tipping bucket | Continuous |

DRAFT

**Chesterfield**
**CSA/MSA:** None
**AQS Site ID:** 45-025-0001
**Location:** SC145, McBee (Rt 2 Box 100)
**County:** Chesterfield
**Coordinates:** +34.615367, -80.198787
**Date Established:** January 6, 2000
**Site Evaluation:** The most recent site evaluation was conducted on April 21, 2003 (QA Check: March 20, 2008).

---

The Chesterfield site is located in the central part of Chesterfield County. The Chesterfield site has continuous monitors for black carbon, $PM_{2.5}$, ozone and meteorological parameters. Sampling is done for $PM_{2.5}$ and $PM_{10}$. In addition to the STN protocol $PM_{2.5}$ speciation sampling, this site also is a precision site with collocated FRM samplers for $PM_{2.5}$, and $PM_{10}$. The sample inlets are 45 meters from the nearest road. The Chesterfield site is a Rural National Air Toxics Trends Site (NATTS) which includes carbonyls, VOC, SVOC and metals sampling.

Changes for 2011:

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

(Table continues on next page)

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Regional | Regional Transport | SLAMS | 3.0 | FRM Gravimetric | 1:3 |
| $PM_{2.5}$ | Regional | Regional Transport | SPM Non-regulatory | 3.0 | TEOM – 50° C | Continuous |
| Speciated $PM_{2.5}$ | Regional | Regional Transport | CSN | 3.0 | Energy dispersive XRF, Ion chromatography, STN TOT | 1:6 |
| $PM_{10}$ | Regional | General / Background | SPM | 3.0 | Gravimetric ICP/MS | 1:6 |
| Collocated $PM_{10}$ | Regional | General / Background | QA Collocated | 3.0 | Gravimetric | 1:6 |
| Ozone | Regional | General / Background | SPM | 2.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| Black Carbon | Regional | General / Background | Non-regulatory | 4.5 | Optical absorption | 5 minutes |
| Carbonyls | Regional | NATTS | Non-regulatory | 3.0 | DNPH/IC | 1:6 |
| Semi-volatiles | Regional | NATTS | Non-regulatory | 3.0 | PUF/GCMS | 1:6 |
| Volatile Organic Compounds | Regional | NATTS | Non-regulatory | 3.0 | Canister/GCMS | 1:6 |
| Wind speed / direction | Neighborhood | Local Conditions | Non-regulatory | 10.0 | Instruments for wind speed and direction | Continuous |

DRAFT

**Ashton**
**CSA/MSA:** None
**AQS Site ID:** 45-029-0002
**Location:** Ashton Road (S-13-18)
**County:** Colleton
**Coordinates:** +33.007866 -80.965038
**Date Established:** March 7, 1990
**Site Evaluation:** The most recent site evaluation was conducted on April 18, 2005 (QA Check: March 19, 2008).

---

The Ashton site is located in northwestern Colleton County. The site was established as a general/background location on 03/07/1990. In addition to monitoring ozone, the Ashton site also monitors $PM_{2.5}$ concentrations. The sample inlets are 8 meters from the nearest road.

Changes for 2011:

The $PM_{2.5}$ continuous monitor designation was changed to SPM/Non-regulatory.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Regional | General / Background | SPM Non-regulatory | 4.0 | TEOM 50°C | Continuous |
| Ozone | Urban | General / Background | SPM | 4.0 | FEM Ultraviolet Photometry | Continuous |

DRAFT

**Network Development**

The South Carolina Ambient Air Monitoring Network provides data to support an array of decisions ranging from development of emissions strategies to protect and improve air quality to the level of activity appropriate for individuals in sensitive populations. To support these varied data users, the network must provide both stable long term measures to document trends and rapid reporting of conditions to the public. In response to land use, population and urban areas growth, the network must be evaluated and adjusted to meet the changing conditions and needs.

The network described in this plan continues to build upon a significant transition from the network that has evolved over the last thirty-five years. It reflects the successes in reducing ambient concentrations of Total Suspended Particulate, lead, carbon monoxide, nitrogen oxides and sulfur dioxide and the increasing concern about the impact of fine particles and ozone on public health.

As resources become available and after the extra monitoring needed in this transition is completed, a series of studies are planned for the major urban areas to gain better understanding of the air quality and provide information to improve the monitoring network. In addition to the intensive studies that provide a detailed 'snapshot,' it is intended that SPM sites be established and monitored in rotation to provide regular checks and long term tracking of the trends in air quality in all areas of the state including smaller cities, towns and rural areas. The implementation of this long term strategy will be developed during this transition and implemented as resources again become available. Project plans will be developed for the monitoring and data analysis activity to better define the scope of these strategies prior to implementation. These studies are long term evaluations the Department has identified for several years and are important for evaluating and improving our knowledge of air quality in the State. However, current budget issues and lack of additional federal funding has led to a high level of uncertainty and makes planning of implementation schedules highly uncertain. The Department will begin the process of evaluating and prioritizing each of the studies listed below as resources once again become available.

Areas where long term strategies are being considered include:

- Columbia MSA Ozone Study - addition of supplementary SPM ozone sites to investigate variability and refine monitoring network to meet objectives.
- Columbia MSA Particulate Surveillance - rotation of SPM $PM_{2.5}$ sites through areas with higher rates of growth and changes in land use to determine trends and understand spatial variability of concentrations (Parklane, Sandhill, and potentially Lower Richland, Lexington and Chapin).
- Aiken MSA Ozone Study - addition of supplementary SPM ozone site to investigate proper size of the network appropriate to represent the MSA.
- Aiken MSA Particulate Study – investigation of $PM_{2.5}$ concentrations in North Augusta and Aiken along with existing rural data to determine population exposure and possible need for monitoring of mass or the components of particulate to assist in area air quality improvement efforts.
- York County Ozone Study - limited investigation of ozone population exposure, spatial variability and transport to supplement existing North and South Carolina monitoring. This study is necessary because of siting issues and lack of long term commitment at the current York CMS monitoring site.

DRAFT

**Sites Discontinued**

The remainder of this document contains information on monitoring sites the Department is scheduling for discontinuance. These sites will be discontinued by January 1, 2011 unless otherwise indicated.

| Site | ID | Date Established | Notes |
|---|---|---|---|
| Anderson Library | 45-007-0004 | 03/25/2008 | This site was established to conduct a limited study of $PM_{2.5}$ in Anderson County. This study has concluded and the site will be shut down. |
| HL Sneed | 45-041-0002 | 01/15/1999 | Site no longer met network design requirements. $PM_{2.5}$ sampling has been relocated to Williams Middle School site. |
| Beck Administration Center | 45-043-0012 | 07/23/2008 | Monitoring does not support current monitoring needs for the area. $PM_{10}$ will continue to be measured in Georgetown at the Howard High complex. |
| Westview | 45-083-0010 | 11/10/1998 | Site no longer met network design requirements. $PM_{2.5}$ sampling has been relocated to T.K. Gregg site. |

DRAFT

**Anderson Library**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Anderson MSA
**AQS Site ID:** 45-007-0004
**Location:** 300 N. McDuffie Street
**County:** Anderson
**Coordinates:** 34.506, -82.648
**Date Established:** March 25, 2008
**Site Evaluation:** pending (QA Check: September 10, 2009).

---

While there are no minimum requirements for $PM_{2.5}$ monitoring in the Anderson MSA, the Department operates a continuous $PM_{2.5}$ monitor in the City of Anderson. With the cooperation of local government and stakeholders, the Department established a site in the City of Anderson to better understand the spatial distribution of $PM_{2.5}$ in the Upstate.

Changes for 2011:

This site will be terminated at the end of 2011. This site was established to be a short term site to assess $PM_{2.5}$ concentrations in the City of Anderson. This assessment has concluded and the Department will terminate the site.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SPM | 2.0 | TEOM | Continuous |

DRAFT

**H L Sneed Middle School**
**CSA/MSA:** Florence MSA
**AQS Site ID:** 45-041-0002
**Location:** 3300 Thornblade Drive
**County:** Florence
**Coordinates:** +34.167636, -79.850404
**Date Established:** January 15, 1999
**Site Evaluation:** The most recent site evaluation was conducted on March 16, 2006 (QA Check: September 22, 2009).

---

The H L Sneed Middle School site is located in Florence County approximately 2 miles SSW of the I-20/I-95 interchange. The site was established to represent population exposure to $PM_{2.5}$ concentrations on the neighborhood scale. The site is located on the edge of the Florence urban area. The sample inlets are 70 meters from the nearest road. Recent changes to monitoring regulations specified that at least one $PM_{2.5}$ site in each MSA was required to have continuous monitoring for public notification. The H L Sneed Middle School site was not large enough to house both the FRM and continuous monitors.

Changes for 2011:

$PM_{2.5}$ sampling at this site has been terminated. Williams Middle School has been designated as the $PM_{2.5}$ SLAMS site for the Florence-Darlington MSA.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 2.5 | FRM Gravimetric | 1:3 |

DRAFT

**Beck Administration Center**
**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA
**AQS Site ID:** 45-043-0012
**Location:** 2018 Church Street
**County:** Georgetown
**Coordinates:** 33.383, -79.294
**Date Established:** July 23, 2008
**Site Evaluation:** pending

---

The Beck Administration Center site is located in Georgetown County in the city of Georgetown. This site was established with cooperation with local stakeholders to represent local concentrations of $PM_{10}$ and provide context for other monitoring in the town of Georgetown. The Beck Administration Center site has continuous $PM_{10}$ monitoring.

Changes for 2011:

This site will be terminated at the end of 2010. This site was originally established to assess $PM_{10}$ concentration on the fringe of the City of Georgetown. Due to other critical monitoring needs, the Department has determined that this site will be terminated but will retain $PM_{10}$ sampling closer to the residential areas of the City of Georgetown through the site at Howard High.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{10}$ | Neighbor-hood | Population Exposure | SPM | 3.0 | TEOM | Continuous |

DRAFT

**West View**
**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA
**AQS Site ID:** 45-083-0010
**Location:** 4198 Copper Line Road
**County:** Spartanburg
**Coordinates:** +34.926839, -82.005211
**Date Established:** November 10, 1998
**Site Evaluation:** The most recent site evaluation was conducted on March 29, 2006 (QA Check: September 16, 2009).

---

The West View site is located in Spartanburg County at the West View Elementary School, west of the City of Spartanburg. The site was established as a $PM_{2.5}$ population exposure sampler on 11/10/1998 and one of the two Core samplers placed to represent the Greenville-Spartanburg Monitoring Planning Area.

The sample inlets are 99.0 meters from the nearest road.

Redefinition of MSA boundaries, the requirement for a maximum exposure/population oriented site and requirement for collocation of continuous monitoring for reporting to the public necessitate relocation of this monitor.

Changes for 2011:

$PM_{2.5}$ sampling at this site has been terminated. T.K. Gregg has been designated as the $PM_{2.5}$ SLAMS site for the Spartanburg MSA.

Monitors:

| Parameter | Scale | Objective | Designation | Probe Height (m) | Analysis Method | Sampling Frequency |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Neighbor-hood | Population Exposure | SLAMS | 2.6 | FRM Gravimetric | 1:1 |

DRAFT

APPENDIX A: Errata

This section will list corrections to the 2011 Monitoring Plan that may arise after submittal to the EPA. The updated plan along with this errata sheet will be posted to the Department's webpage.

| Date | Item |
|---|---|
| | |

DRAFT