Georgia's Redesignation Request and Maintenance Plan for the Atlanta Nonattainment Area for the 1997 $PM_{2.5}$ NAAQS

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Georgia Department of Natural Resources
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Executive Summary

This document contains Georgia's request under the Clean Air Act Amendments of (CAA) of 1990 that the Atlanta nonattainment area be redesignated to attainment with respect to the annual National Ambient Air Quality Standard (NAAQS) for $PM_{2.5}$ (1997 fine particulate matter standard, retained in 2006). The document also includes Georgia's plan to maintain attainment of the $PM_{2.5}$ standard in the Atlanta area.

This request is based on three years, 2008-2010, of ambient monitoring data showing attainment of the standard (15.0 $\mu g/m^3$) consistent with the clean data policy memo (Stephen Page 12/14/2004); the implementation of permanent and enforceable reductions in $PM_{2.5}$ and $PM_{2.5}$ precursor emissions; compliance with all applicable requirements; and the Atlanta Area Maintenance Plan with projections demonstrating maintenance of the standard through the year 2024.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST of APPENDICES

List of Acronyms

Acronym	Meaning	Acronym	Meaning
AEO	Annual Energy Outlook	ERTAC	Eastern Regional Technical Advisory Committee
AERR	Annual Emissions Reporting Requirements	FGD	Flue Gas Desulfurization
AIRS	Aerometric Information Retrieval System	FR	Federal Register
AQS	Air Quality Subsystem	FRM	Federal Reference Method
ARC	Atlanta Regional Commission	GDOT	Georgia Department of Transportation
CAA	Clean Air Act	GFC	Georgia Forestry Commission
CAIR	Clean Air Interstate Rule	HC	Hydrocarbon
CARB	California Air Resources Board	HPMS	Highway Performance Monitoring System
CERR	Consolidated Emissions Reporting Rule	ICI	Industrial and Commercial/Institutional
CFR	Code of Federal Regulations	MOU	Memorandum of Understanding
CO	Carbon Monoxide	MOVES	Motor Vehicle Emissions Simulator
CSAPR	Cross-state Air Pollution Rule	MPO	Metropolitan Planning Organization
DNR	Department of Natural Resources	MVEB	Motor Vehicle Emissions Budget
DOT	Department of Transportation	MWe	Megawatt Electrical
EGAS	Economic Growth Analysis System	MWh	Megawatt Hours
EGU	Electric Generating Unit	NAA	Nonattainment Area
EPA	Environmental Protection Agency	NAAQS	National Ambient Air Quality Standard
EPD	Environmental Protection Division	NCD	NMIM County Database

Acronym	Meaning	Acronym	Meaning
NEI	National Emissions Inventory	SCR	Selective Catalytic Reduction
NMIM	National Mobile Inventory Model	SEMAP	Southeastern Modeling Analysis Plan
NTE	Not-To-Exceed	SIP	State Implementation Plan
NO_x	Nitrogen Oxides	SMP	Smoke Management Plan
OAQPS	Office of Air Quality Planning and Standards	SO_2	Sulfur Dioxide
PM	Particulate Matter	SOA	Secondary Organic Aerosols
$PM_{2.5}$	Fine Particulate Matter	STN	Speciated Trends Network
PMF	Positive Matrix Factorization	tpy	tons per year
Ppm	parts per million	SUV	Sport Utility Vehicle
RACM	Reasonably Available Control Measures	ULSD	Ultra-Low Sulfur Diesel
RACT	Reasonably Available Control Technology	VISTAS	Visibility Improvement State and Tribal Association of the Southeast
RFP	Reasonable Further Progress	VMT	Vehicle Miles Traveled
SCC	Source Classification Code	WRD	Wildlife Resources Division

1.0 Introduction

This document contains the technical support for the Georgia Environmental Protection Division's (EPD's) request that the Atlanta nonattainment area be redesignated as an area attaining the 1997 annual fine particulate matter ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS) pursuant to Sections 107(d)(3)(D) and (E) of the Clean Air Act (CAA), as amended. This redesignation request was prepared in accordance with U.S. EPA Guidance issued in 1992 (memorandum dated September 4 of that year from John Calcagni[1]).

1.1 Nonattainment Designation and Attainment Demonstration

In 2005, EPA designated four $PM_{2.5}$ nonattainment areas in Georgia: Atlanta, Chattanooga (which also includes parts of Alabama and Tennessee), Floyd County, and Macon. Figure 1-1 shows their locations. The Atlanta nonattainment area is located in the northwest quadrant of the state and is comprised of twenty whole counties and two partial counties: Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Rockdale, Spalding, Walton, Heard (partial), and Putnam (partial) [reference 70FR965].

[1] "Procedures for Processing Requests to Redesignate Areas to Attainment", September 4, 1992, John Calcagni, Director, Air Quality Management Division, OAQPS, USEPA.

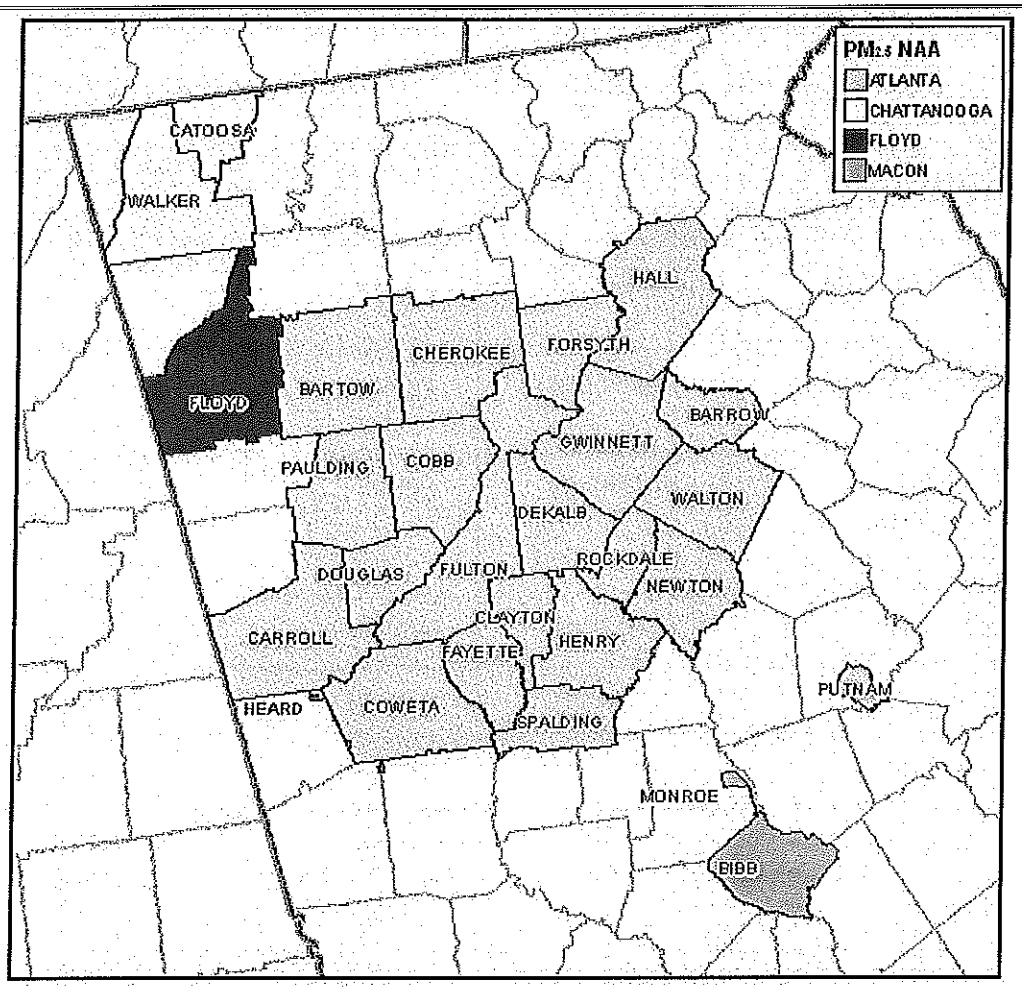


Figure 1-1. $PM_{2.5}$ Nonattainment Areas in Georgia

The part of Heard County included in the nonattainment area is the northeast portion that extends north of 33 degrees 24 minutes (north) to the Carroll county border and east of 85 degrees 33 minutes (west) to the Coweta County border. The part of Putnam County included in the nonattainment area is the area described by U.S. Census 2000 block group identifier 13-237-9603-1. Coal-fired electric generating units are located in both of the partial counties.

EPA made initial designations of nonattainment areas, including the Atlanta nonattainment area, for the 1997 annual $PM_{2.5}$ NAAQS on January 5, 2005 (70FR944), and amended the designations on April 5, 2005 (70FR19844). 2001 - 2003 $PM_{2.5}$ design values exceeded the standard at seven of nine monitoring sites located within the boundaries of the nonattainment area. The highest design value was 18.0 $\mu g/m^3$ at the Fire Station No. 8 monitor located in Fulton County. The observed $PM_{2.5}$ design values at Atlanta's nonattainment area monitors violated the annual standard, as shown in Table 1-1 below.

Table 1-1. $PM_{2.5}$ Design Values for Atlanta Area Monitors 2001-2003

Site Name	Monitor ID	County	$PM_{2.5}$ Design Value 2001-2003 ($\mu g/m^3$)
Forest Park-Georgia DOT	13-063-0091	Clayton	16.1
Kennesaw-National Guard	13-067-0003	Cobb	16.1
Powder Springs-Macland Aquatic Center	13-067-0004	Cobb	NA
South DeKalb	13-089-0002	DeKalb	15.7
Doraville	13-089-2001	DeKalb	16.1
E. Rivers School	13-121-0032	Fulton	16.3
Fire Station No. 8	13-121-0039	Fulton	18.0
Georgia Tech	13-121-0048	Fulton	NA*
Gwinnett Tech	13-135-0002	Gwinnett	15.6
Gainesville-Fair Street School	13-139-0003	Hall	14.9
Yorkville	13-223-0003	Paulding	14.1

* The Georgia Tech monitor began operation in 2006 and stopped operation in 2008.

The State of Georgia prepared and submitted a $PM_{2.5}$ attainment demonstration plan for the Atlanta Nonattainment Area to EPA Region 4 on July 6, 2010 (cover date is May 24, 2010). The plan was based on modeling of the effects of existing and planned control measures on air quality in the Atlanta area and demonstrated attainment of the standard by April 5, 2010.

Since EPA has determined that the area has met the clean data requirements and attained the standard prior to the attainment date (76FR 76620), the SIP requirements that the July 6, 2010 attainment demonstration was required to fulfill are suspended. The attainment demonstration plan has been withdrawn and will be replaced with this maintenance plan. Relief from the requirement to submit an attainment demonstration as well as Reasonable Further Progress (RFP), associated RACM, and contingency requirements upon clean data determination is specified in 40 CFR 1004(c) and also in a December 14, 2004 memo from Stephen D. Page of U.S. EPA.

1.2 Redesignation Request

This document contains Georgia's request that the Atlanta nonattainment area be redesignated to attainment with respect to the annual NAAQS for $PM_{2.5}$ (1997 fine particulate matter standard, retained in 2006). Section 107(d) of the CAA states that an area can be redesignated to attainment if the following conditions are met:

1. The EPA has determined that the NAAQS has been attained.

2. The applicable implementation plan has been fully approved by EPA under Section 110(k).

3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.

4. The state has met all applicable requirements for the area under Section 110 and Part D.

5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area as required by CAA Section 175A.

The supporting documentation to show that the above conditions have been met is contained in Sections 2 and 3. EPA's approval of this document will satisfy the fifth condition.

1.3 Maintenance Plan

The maintenance plan (see above) has two required components under Section 175A:

- A demonstration of maintenance of the standard for at least ten years after redesignation; and
- Contingency provisions for prompt correction of any future violations.

Per EPA guidance,[2] the Atlanta area $PM_{2.5}$ maintenance plan also includes the following elements:

- An attainment year emissions inventory (to support the maintenance demonstration);
- A commitment to continued operation of ambient monitoring equipment in the area; and
- Verification of continued attainment.

The maintenance plan is presented in Section 3.

[2] "Procedures for Processing Requests to Redesignate Areas to Attainment", September 4, 1992, John Calcagni, Director, Air Quality Management Division, OAQPS, USEPA

2.0 Redesignation Request

As noted in Section 1.2 of this document, Section 107(d) of the CAA states that an area can be redesignated to attainment if the following conditions are met:

1. The EPA has determined that the NAAQS has been attained.
2. The applicable implementation plan has been fully approved by EPA under Section 110(k).
3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
4. The state has met all applicable requirements for the area under Section 110 and Part D.
5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area under CAA Section 175A.

This section of the document includes supporting documentation for the following:

- Attainment of the annual $PM_{2.5}$ NAAQS based on ambient data from 2008 through 2010;
- Approval by EPA of the implementation plan under Section 110(k);
- Improvement of air quality with respect to $PM_{2.5}$ is due to permanent and enforceable reductions in emissions; and
- The state has met all applicable requirements for the area under Section 110 and Part D.

2.1 Attainment of the Annual $PM_{2.5}$ NAAQS

A monitoring site is in attainment of the annual $PM_{2.5}$ standard when the annual standard design value is less than or equal to 15.0 micrograms per cubic meter ($\mu g/m^3$) per Appendix N of 40 CFR Part 50. The annual standard design value is the 3-year average of the annual mean, which is, in turn, the average of one year's 4-calendar-quarter averages. The data must be complete and quality-assured, consistent with 40 CFR Part 58 requirements and other relevant EPA guidance. Therefore, for a single site to meet the standard, the annual design value calculated from the previous three calendar years must be less than or equal to the standard. For a nonattainment area to achieve attainment, all monitoring sites in the nonattainment area must be in attainment.

The Atlanta area design values, based on data from 2008 through 2010 for each monitor, are less than 15.0 $\mu g/m^3$, which demonstrates attainment of the standard. The monitoring network and ambient $PM_{2.5}$ data are presented below.

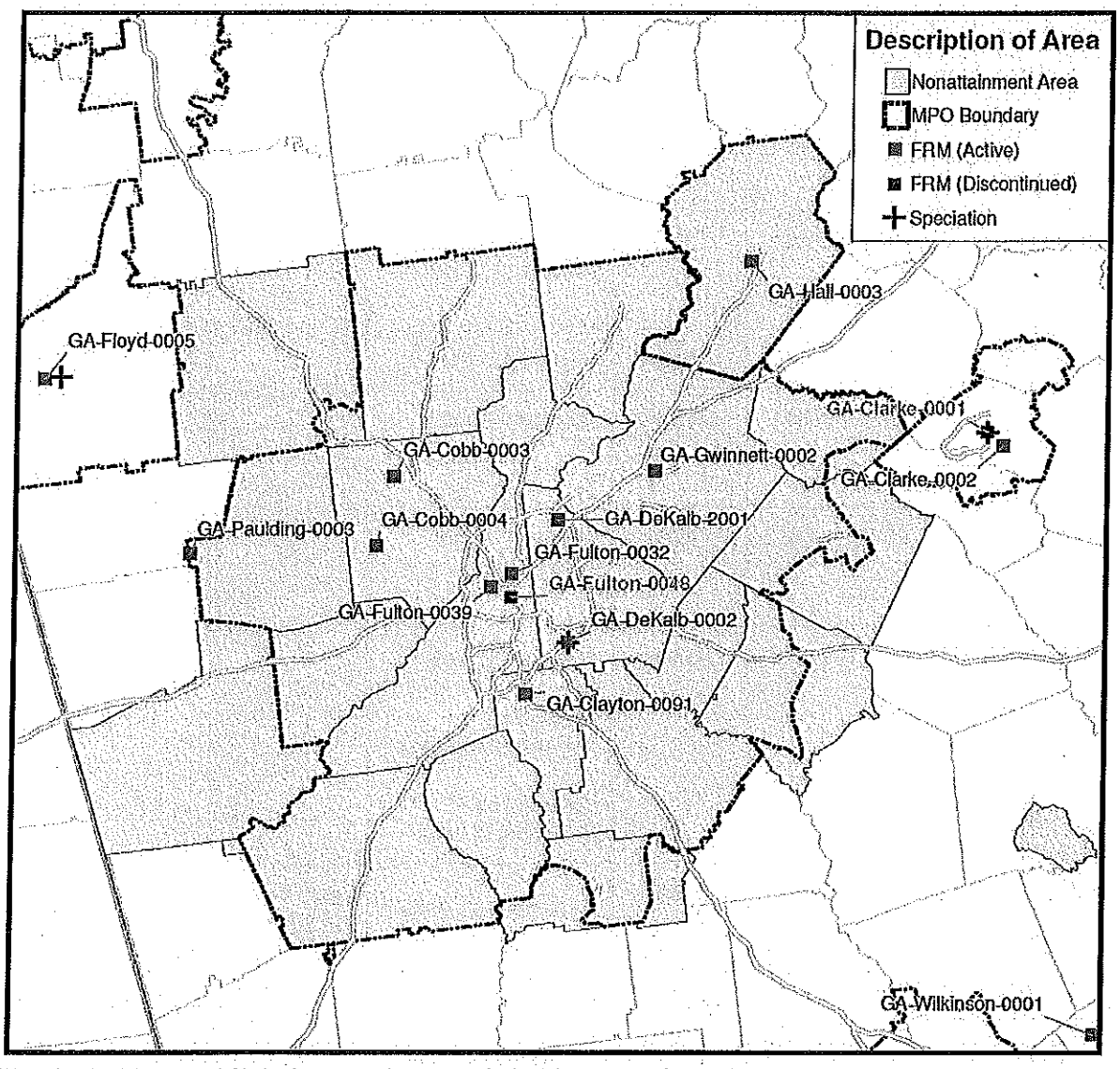
2.1.1 Monitoring Network

There are currently ten active ambient $PM_{2.5}$ FRM monitoring sites in the Atlanta nonattainment area, as shown in Table 2-1 and Figure 2-1. Providing adequate coverage of the nonattainment area, data from these sites represent a neighborhood scale, which extends up to 4.0 kilometers from each monitor. The sites are considered to be part of the State and Local Air Monitoring Stations (SLAMS) monitoring network, with the monitoring objective of sampling for population exposure. The FRM monitors were installed in accordance with 40 CFR 58.

The Fire Station No.8 (13-121-0039) $PM_{2.5}$ FRM sampler, located in Fulton County, ran every three days from 1/21/99 to 9/29/06. The sampler was shut down due to the potential effects of building ventilation stacks (used for fire engine exhaust) on measured $PM_{2.5}$ levels and the proximity of trees to the monitor, which violated siting criteria. The Georgia Tech sampler (13-121-0048) ran from

9/26/06 until 12/29/08 as an additional urban site until it was decided that the Fire Station No. 8 sampler would meet siting criteria if it were moved 20 feet from its original location. The Fire Station No. 8 sampler was restarted on 12/2/08.

One Speciated Trends Network (STN) monitor is located at the South DeKalb site (13-089-0002). The STN monitor has been collecting data since March 2, 2001. The sampling schedule of the STN monitor began as every six days and ran on that schedule until March 26, 2001, when it changed to every three days.



*Note the Floyd County and Clarke County monitors are not in the Atlanta Nonattainment Area.

Figure 2-1. Locations of Atlanta Area $PM_{2.5}$ Sampling Sites.

Table 2-1. Atlanta Area $PM_{2.5}$ Data Collection Sites

Site Name	AQS* Site ID	County	Start Date – FRM Data Collection	End Date - FRM Data Collection	Start Date – Speciation Data Collection	End Date - Speciation Data Collection
Forest Park-Georgia DOT	13-063-0091	Clayton	January 9, 1999			
Kennesaw-National Guard	13-067-0003	Cobb	February 7, 1999			
Powder Springs-Macland Aquatic Center	13-067-0004	Cobb	February 5, 2003			
South DeKalb	13-089-0002	Dekalb	January 22, 1999		October 1, 2000	
Doraville	13-089-2001	Dekalb	January 1, 1999			
E. Rivers School	13-121-0032	Fulton	January 1, 1999			
Fire Station No. 8	13-121-0039	Fulton	January 21, 1999 Stopped on September 30, 2006 Restarted on December 2, 2008			
Georgia Tech	13-121-0048	Fulton	September 26, 2006	December 29, 2008		
Gwinnett Tech	13-135-0002	Gwinnett	January 1, 2000			
Gainesville-Fair Street School	13-139-0003	Hall	February 14, 1999			
Yorkville	13-223-0003	Paulding	January 24, 1999			

* EPA's Air Quality System

2.1.2 Ambient $PM_{2.5}$ Data

Table 2-2 shows the annual average $PM_{2.5}$ concentrations and the associated 3-year average that demonstrate attainment of the standard in the Atlanta area. The 2008–2010, 3-year design values for each monitor are below the standard of 15.0 $\mu g/m^3$. The table includes annual averages from 2003 through 2010, demonstrating the downward trend in the measured ambient $PM_{2.5}$ level in the nonattainment area. The concentrations provided in Table 2-2 for 2010 for each monitor show continued evidence that the area is meeting the standard. To date, the quality-assured annual averages for 2011 are not available.

Table 2-2. Annual and 3-year Average Ambient $PM_{2.5}$ Concentrations

	Ambient $PM_{2.5}$ Concentration ($\mu g/m^3$)									
Site Name	2003	2004	2005	2006	2007	2008	2009	2010	2008-2010 w/out data substitution	2008-2010 with data substitution
Forest Park-Georgia DOT (13-063-0091)	16.0	16.8	16.6	16.7	15.3	13.7	11.5	13.4	12.9	N/A
Kennesaw-National Guard (13-067-0003)	16.0	15.8	16.3	16.5	15.3	13.5	11.2	12.2	12.3	N/A
Powder Springs-Macland Aquatic Center (13-067-0004)	15.2	15.2	15.5	15.8	14.5	13.1	10.3	12.1	11.9	12.3
South DeKalb (13-089-0002)	15.0	16.1	15.5	15.4	14.8	12.7	11.4	12.3	12.1	N/A
Doraville (13-089-2001)	15.4	15.5	15.8	14.5	15.1	13.1	11.7	12.2	12.3	N/A
E. Rivers School (13-121-0032)	16.1	16.1	15.9	15.4	15.7	13.0	11.6	12.2	12.3	13.0
Fire Station No. 8 (13-121-0039)	17.7	17.6	17.0	18.4	--	7.6	12.1	14.5	11.4	13.6
Georgia Tech (13-121-0048)*	--	--	--	15.1	15.5	14.3	--	--	--	--
Gwinnett Tech (13-135-0002)	16.2	16.1	16.1	16.9	14.2	12.4	11.6	12.3	12.1	12.5
Gainesville-Fair Street School (13-139-0003)	14.7	14.0	14.5	13.8	13.4	11.8	10.2	11.4	11.2	11.9
Yorkville (13-223-0003)	13.8	13.4	14.6	13.9	14.3	11.9	9.9	11.2	11.0	11.6

*The Georgia Tech monitor stopped operation on December 29, 2008.

Because of data completeness issues at the Powder Springs, E. Rivers School, Fire Station #8/Georgia Tech, Gwinnett Tech, and Yorkville monitors for the 2007–2009 and 2008–2010 periods. EPA performed a quarterly maximum data substitution test using 40 CFR Part 50 Appendix N and the April 1999 Guideline on Data Handling Conventions for the PM NAAQS.

The Fire Station #8 monitor was relocated to the Georgia Tech campus and was assigned a separate AQS number. It was moved back to Fire Station #8 at the end of 2008 and resumed normal operation. There were no data completeness issues at either site during the times each site was operated. Further information on the data substitution used for the Atlanta area monitors can be found in the September 14, 2011, Federal Register notice (76 FR56701) and its corresponding Technical Support Document.

2.1.3 Clean Data Determination

On December 8, 2011, EPA promulgated its determination (76 FR 76620) that the Atlanta nonattainment area had attained the 1997 annual average $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). This determination was based upon quality-assured and certified ambient air monitoring data for the 2008-2010 period that showed design values below 15.0 $\mu g/m^3$ as indicated in Table 2-2. With the clean data determination, EPA suspended the requirements for the nonattainment area to submit an attainment demonstration, a reasonable further progress (RFP) plan, associated RACM and contingency measures. These requirements are suspended as long as the area continues to attain the standard. This final rule became effective on January 9, 2012.

2.2 Implementation Plan Under Section 110(k)

Section 110(k) of the CAA addresses EPA's actions on state implementation plan submittals (completeness, deadline for action by EPA, etc.). A September 4, 1992 memo from John Calcagni of EPA states the following:

"The SIP for the area must be fully approved under section 110(k), and must satisfy all requirements that apply to the area. It should be noted that approval action on SIP elements and the redesignation request may occur simultaneously."

The State of Georgia has prepared and submitted a $PM_{2.5}$ attainment demonstration plan for the Atlanta Nonattainment Area. The plan was submitted for approval to EPA Region 4 on July 6, 2010. As discussed in Section 1.2 of this redesignation request and maintenance plan, the attainment demonstration, RFP, associated RACM, and contingency requirements that the July 6, 2010 SIP revision was required to fulfill have been suspended. Therefore, the attainment demonstration has been withdrawn and substituted with submittal of this maintenance plan. There are no longer any Section 110(k) requirements to be met.

2.3 Permanent and Enforceable, and Other Reductions in Emissions

In order for the nonattainment area to be redesignated to attainment, the State must demonstrate (and EPA must determine) that the improvement of ambient $PM_{2.5}$ concentrations during the years 2008 through 2010 is due to permanent and enforceable reductions in emissions that were implemented following the nonattainment design value period (2001–2003). This subsection contains Georgia EPD's demonstration that the improved air quality is due to permanent and enforceable emissions reductions. The elements of the demonstration described below are as follows:

- Source apportionment, which links individual, observed ambient $PM_{2.5}$ species to specific emissions sources;
- State control measures and associated emissions reductions;
- Federal control measures and associated emissions reductions; and
- Reductions in SO_2 emissions from upwind states.

2.3.1 Source Apportionment of Ambient $PM_{2.5}$

Source apportionment of speciated ambient pollutant measurements is an important tool for the prioritization of pollutant control strategies. Presented here are source-apportionment results for 2003-2004 speciated $PM_{2.5}$ measurements in the Atlanta, Floyd County, and Macon areas (Figure 2-2 and Table 2-3). The source-apportionment results are based on Positive Matrix Factorization (PMF), a factor analytic method that distinguishes correlation patterns among speciated $PM_{2.5}$ measurements in a given location. More detailed information on source apportionment is presented in Appendix A.

The similarities between the PMF results for the three sites show the regional nature of $PM_{2.5}$. The major impacting factors at all sites are secondary sulfates, secondary organic aerosols (SOA), mobile sources, and biomass burning. The Atlanta area, as expected, has higher levels of mobile-source $PM_{2.5}$, compared to Floyd County and Macon. On the other hand, these latter two sites exhibit higher levels of soil dust, and the Macon site exhibits a relatively high contribution of Lime/Minerals $PM_{2.5}$. This is likely due to local sources in the industrial area where the site is located.

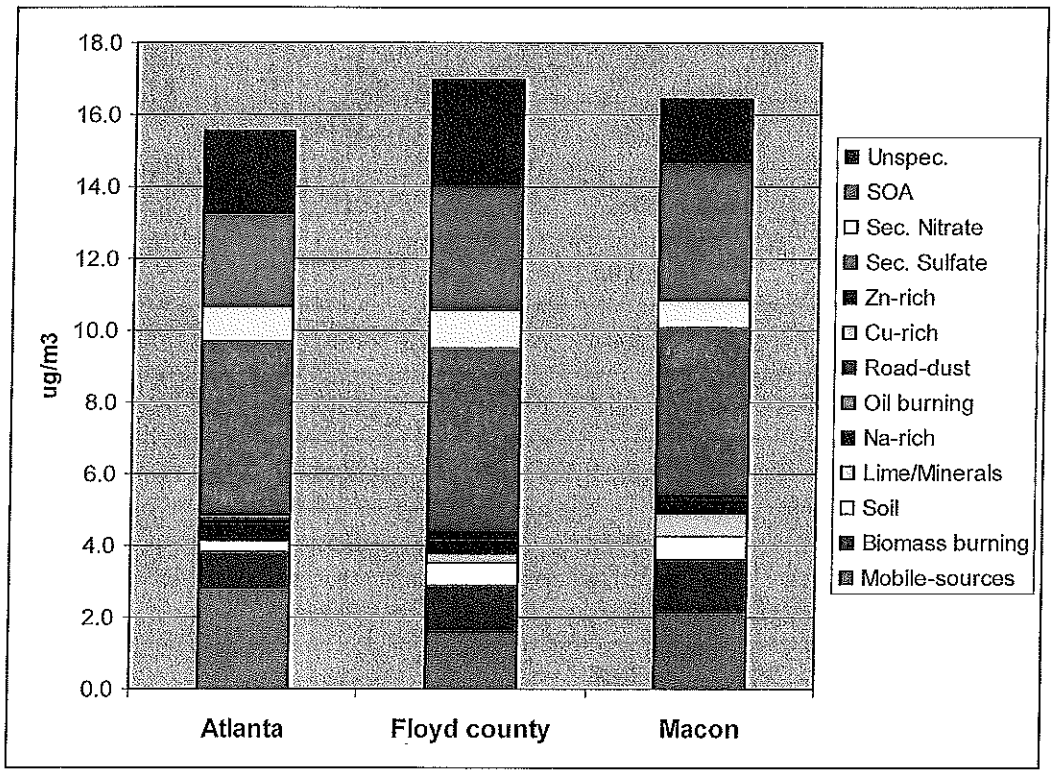


Figure 2-2: Average factor contributions for 2003-04 at the Atlanta, Floyd County, and Macon STN sites using PMF

These results are useful for an assessment of control strategies. Secondary sulfate makes up approximately five $\mu g/m^3$ (32%) of ambient $PM_{2.5}$, the largest contribution of all of the factors. SOAs make up the next largest contribution at 20%. The contribution of secondary nitrate is only one-fifth of the contribution of sulfate. Contributions from all other source-categories were small in general, though the Macon and Rome sites seem to be affected by local sources related to lime/minerals processing and soil dust re-suspension.

Secondary sulfates are formed in the atmosphere from SO_2 emissions. As the sulfate fraction is the largest fraction of ambient $PM_{2.5}$, it is evident that controlling SO_2 emissions (generated primarily by coal-burning EGUs) would reduce $PM_{2.5}$ levels throughout the state. Secondary nitrates are associated with NO_x emissions from combustion, primarily combustion in EGUs and in on-road mobile sources. SOAs are associated with biogenic emissions (natural emissions from living trees and other vegetation). It is not practical to control biogenic emissions. Biomass burning generates elemental carbon (soot) and is associated with wildfires, prescribed burning, and wood-fired boilers. In addition to NO_x, mobile sources generate elemental carbon.

Table 2-3. Average factor contributions to $PM_{2.5}$ ($\mu g/m^3$) for 2003-04 at the Atlanta, Floyd County, and Macon STN sites using PMF

Factor	Atlanta	Floyd County	Macon
Unspecified	2.32	2.97	1.81
SOA	2.55	3.46	3.81
Sec. Nitrate	0.99	1.05	0.74
Sec. Sulfate	4.82	5.10	4.67
Zn-rich	0.03	0.03	0.03
Cu-rich	0.07	0.03	0.02
Road-dust	0.12	0.13	0.11
Oil burning	0.03	0.04	0.04
Na-rich	0.43	0.42	0.33
Lime/Minerals	0.05	0.24	0.59
Soil	0.29	0.61	0.67
Biomass burning	1.06	1.31	1.50
Mobile sources	2.78	1.61	2.12

2.3.2 State Control Measures - Georgia

Based on source factor analysis, Georgia's control strategy is focused on the reduction of emissions associated with secondary sulfates and nitrates, biomass burning, and mobile sources. Control of SO_2 is the most important component of the strategy, as secondary sulfates make up the largest controllable contribution to ambient $PM_{2.5}$. State measures that target reduction of these emissions are:

- SO_2 and NO_x controls on EGUs – Georgia Rule (sss);
- SO_2 limits on EGUs – Georgia Rule (uuu); and
- The Smoke Management Plan.

Table 2-4 shows the timetable of implementation of these measures as well as the species controlled by each measure. The correlation between the drop in $PM_{2.5}$ annual averages and the implementation of the control measures, particularly Georgia Rule 391-3-1-.02(2)(sss), lends strong evidence that the improvements in air quality are a result of reduction in emissions and not a meteorologically-influenced phenomenon. Detailed discussions of the measures are presented in the following subsections.

Table 2-4. Timetable of State Measure Implementation

$PM_{2.5}$ ann. avg. ($\mu g/m^3$), Atlanta Area Monitors		**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Forest Park-Georgia DOT (13-063-0091)		16.0	16.8	16.6	16.7	15.3	13.7	11.5	13.4
Kennesaw-National Guard (13-067-0003)		16.0	15.8	16.3	16.5	15.3	13.5	11.2	12.2
Powder Springs-Macland Aquatic Center (13-067-0004)		15.2	15.2	15.5	15.8	14.5	13.1	10.3	12.1
South DeKalb (13-089-0002)		15.0	16.1	15.5	15.4	14.8	12.7	11.4	12.3
Doraville (13-089-2001)		15.4	15.5	15.8	14.5	15.1	13.1	11.7	12.2
E. Rivers School (13-121-0032)		16.1	16.1	15.9	15.4	15.7	13.0	11.6	12.2
Fire Station No. 8 (13-121-0039)		17.7	17.6	17.0	18.4	--	7.6	12.1	14.5
Georgia Tech (13-121-0048)*		--	--	--	15.1	15.5	14.3	--	--
Gwinnett Tech (13-135-0002)		16.2	16.1	16.1	16.9	14.2	12.4	11.6	12.3
Gainesville-Fair Street School (13-139-0003)		14.7	14.0	14.5	13.8	13.4	11.8	10.2	11.4
Yorkville (13-223-0003)		13.8	13.4	14.6	13.9	14.3	11.9	9.9	11.2
Measure	**Species controlled**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Georgia Rule (sss)	SO_2, NO_x						**		
Georgia Rule (uuu)	SO_2								
Smoke Management Plan	PM, NO_x								

* The Georgia Tech monitor stopped operation on December 29, 2008.

**Controls were required on December 31, 2008, but were actually started up in the first half of the year.

2.3.2.1 SO_2 and NO_x Controls and SO_2 Limits

Atmospheric secondary sulfate is formed from emissions of SO_2. Coal-fired EGUs are by far the most significant source of SO_2 emissions in Georgia and in the Southeast. Georgia's Multipollutant Rule [391-3-1-.02(2)(sss)] requires flue gas desulfurization (FGD) and selective catalytic reduction (SCR) controls on the majority of coal-fired EGUs in Georgia. This state-enforceable rule was promulgated in 2007 for the purposes of lowering ozone and $PM_{2.5}$ concentrations by controlling precursor emissions and for reducing mercury deposition. The FGD controls reduced SO_2 emissions rates from the affected emissions units by at least 95 percent and the SCR controls reduced NO_x emissions rates by approximately 85 percent. The SO_2 and NO_x controls were required in support of EPA's CAIR rule, which was promulgated in 2005 and required statewide caps for NO_x and SO_2 beginning in 2009 and 2010, respectively. The CAIR rule is discussed further in Section 2.3.3.

Georgia Rule (uuu), SO_2 Emissions from Electric Utility Steam Generating Units, is a companion rule to Rule (sss) and is both state and federally enforceable upon approval by EPA. Both of these rules were implemented in response to CAIR and require emissions reductions consistent with CAIR's original schedule starting in 2009. The rule requires 95% reduction of SO_2 emissions from the majority of Georgia's coal-fired EGUs, with the requirement being phased in from 2010 through 2016. It requires 95% reduction of SO_2 emissions from three of the four EGUs at Plant Bowen by January 1, 2010, and the fourth unit by January 1, 2012, on both coal-fired EGUs at Plant Wansley by January 1, 2010, and both EGUs at Plant McDonough in 2012, and at the two largest EGUs at Plant Yates by 2015.[3]

It has been well demonstrated that ambient secondary sulfate in a given location can be significantly affected by SO_2 emissions from distant sources. Therefore, secondary sulfate in the Atlanta Area is due not only to SO_2 emissions from Plant Yates, Plant Wansley, and Plant Bowen, located inside the nonattainment area, but also to SO_2 emissions from other coal-fired EGUs in north Georgia. Plant McDonough has been completely converted to a combined cycle combustion turbine facility and is no longer a coal-fired facility.

Figure 2-3 shows the locations of the coal-fired EGU facilities in the northern half of Georgia as well as their respective energy production (in million megawatt-hours) in the year 2007. Plant Bowen was a close second to Plant Scherer in energy production and historically has been by far the highest SO_2-emitting facility in the state. Plant Scherer, which was first in Georgia in energy production, is located approximately 20 miles from the Atlanta nonattainment area. The facilities shown in the figure comprise seven of the ten coal-fired EGU facilities that were operated in Georgia in 2007. In 2007, the energy produced by the seven facilities made up 97 percent of the statewide energy production from coal-fired facilities.

[3] One of the smaller EGUs at Plant Yates has an existing SO_2 scrubber that was required to achieve 90% SO_2 reduction by January 1, 2010.

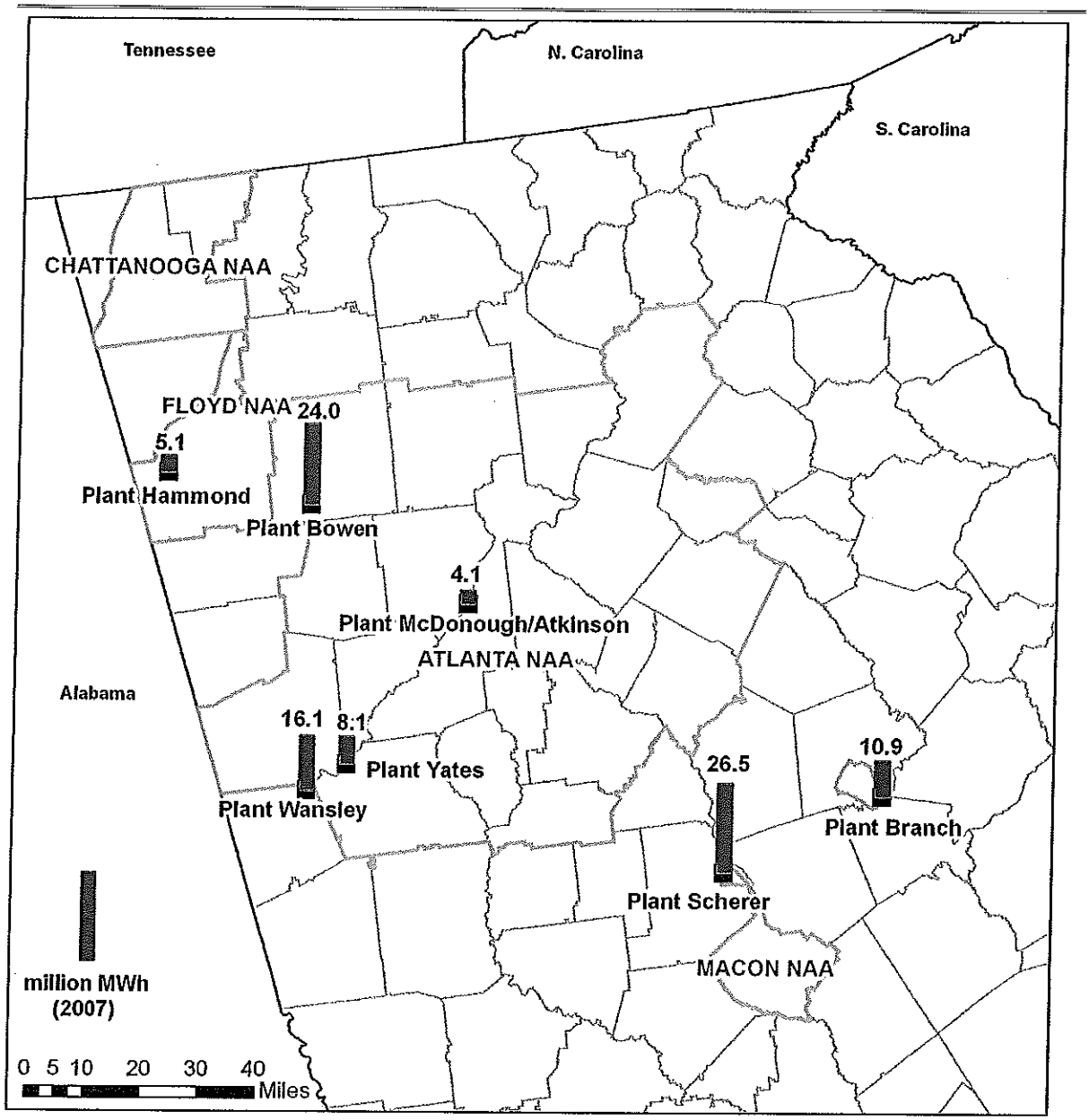


Figure 2-3. Locations and 2007 Energy Production of Coal-fired EGU Facilities in North Georgia

SCR Controls Required by Rule (sss)

Rule (sss) requires SCR controls to be operated year-round, starting with six EGUs in 2008 and 2009. Of these six units, which include Bowen Units 2, 3, and 4; Wansley Units 1 and 2; and Hammond Unit 4; Bowen and Wansley's units are located in the Atlanta nonattainment area.

The schedule for the operation of SCRs on the remaining EGUs in the Atlanta NAA is as follows:

- Bowen Unit 1 has been required to operate an SCR year-round since June 2010.
- McDonough Unit 2 was required to operate an SCR year-round beginning in December 2011; however, the facility has been completely converted to a combined-cycle combustion turbine facility and is no longer a coal-fired facility.
- McDonough Unit 1 was required to operate an SCR year-round beginning in April 2012; however, the facility has been completely converted to a combined-cycle combustion turbine facility and is no longer a coal-fired facility.
- Plant Yates Units 6 and 7 are required to operate an SCR year-round beginning in June of 2015.
- Beginning in January of 2018, the remaining Units 2 through 5 at Plant Yates are required to be evaluated for additional mercury controls if the total annual heat input of those units combined exceeds 33,608,398 million Btu. Any additional required controls could contribute to reduced NO_x and SO_2 emissions.

Bowen Units 1, 2, 3, and 4; Wansley Units 1 and 2; and Hammond Unit 4 have NO_x controls that were already in place and operating during the ozone control season by the end of 2003. The Title V permit of each of these facilities has been amended to permit operation of the FGD and SCR controls.

FGD Controls Required by Rule (sss)

The required FGD control implementation date varies by EGU, starting on December 31, 2008. SO_2 controls were actually started on five units in May 2008. SO_2 controls were operating for the entire year of 2009 as follows:

- Plant Hammond – controls on 4 of 4 units;
- Plant Bowen – controls on 2 of 4 units; and
- Plant Wansley – controls on 1 of 2 units.

SO_2 controls on a third unit at Plant Bowen and the second unit at Plant Wansley began operation on April 1, 2009.

Table 2-5 shows the annual SO_2 emissions for the coal-fired facilities in north Georgia for the period 2003 through 2010. The table also includes the electrical generation, a measure of production, for the facilities for the same time period. This data is presented in graphical form in Figure 2-4.

Comparing 2003 to 2010, SO_2 emissions were reduced by 60.2 percent while generation was down only by 4.7 percent. These statistics provide clear evidence that the reduction in $PM_{2.5}$ concentration is due to permanent and enforceable controls rather than to reduced generation.

Table 2-5. Annual SO_2 Emissions and Generation (10^6 MWh) from North Georgia Coal-fired EGU Facilities, 2003 – 2010

Facility		2003	2004	2005	2006	2007	2008	2009	2010
Hammond	SO_2 (tpy)	35,900	37,700	39,500	40,600	47,800	12,500*	900*	2,427
	generation	4.79	4.11	4.64	4.27	5.09	4.32	3.73	3.23
Bowen	SO_2 (tpy)	164,900	165,900	186,500	206,400	196,800	148,100*	54,800*	7,618
	generation	21.9	21.9	23.3	23.7	24.0	23.4	22.9	24.7
Branch	SO_2 (tpy)	64,800	70,100	90,500	96,000	98,400	94,000	60,100	53,258
	generation	8.28	7.97	10.3	10.8	10.9	10.7	6.82	6.09
McDonough	SO_2 (tpy)	23,900	22,700	27,700	28,800	28,500	24,300	15,900	17,115
	generation	3.75	3.52	3.92	4.07	4.07	3.43	2.34	2.28
Scherer	SO_2 (tpy)	83,900	79,700	82,900	74,200	76,500	77,700	69,500	69,862
	generation	21.3	24.6	25.5	24.5	26.5	25.7	24.3	24.5
Wansley**	SO_2 (tpy)	94,000	99,000	101,500	96200	93,900	74,300*	7400*	2,343
	generation	13.7	14	15.1	14.8	16.1	15.5	11.8	9.79
Yates	SO_2 (tpy)	44,900	50,600	66,500	75,500	77,200	68,200	45,500	54,256
	generation	6.73	6.22	7.37	7.49	8.10	7.37	4.90	6.06
TOTAL SO_2	**Tons/yr**	**512,300**	**525,700**	**595,100**	**617,700**	**619,100**	**499,100**	**254,100**	**203,879**
TOTAL Generation	**10^6 MWh**	**80.45**	**82.32**	**90.13**	**89.6**	**94.76**	**90.42**	**76.79**	**76.65**

Continued, next page.

$PM_{2.5}$ ann. avg. (µg/m3), Atlanta Area Monitors		2003	2004	2005	2006	2007	2008	2009	2010
Forest Park-Georgia DOT (13-063-0091)		16.0	16.8	16.6	16.7	15.3	13.7	11.5	13.4
Kennesaw-National Guard (13-067-0003)		16.0	15.8	16.3	16.5	15.3	13.5	11.2	12.2
Powder Springs-Macland Aquatic Center (13-067-0004)		15.2	15.2	15.5	15.8	14.5	13.1	10.3	12.1
South DeKalb (13-089-0002)		15.0	16.1	15.5	15.4	14.8	12.7	11.4	12.3
Doraville (13-089-2001)		15.4	15.5	15.8	14.5	15.1	13.1	11.7	12.2
E. Rivers School (13-121-0032)		16.1	16.1	15.9	15.4	15.7	13.0	11.6	12.2
Fire Station No. 8 (13-121-0039)		17.7	17.6	17.0	18.4	--	7.6	12.1	14.5
Georgia Tech (13-121-0048)		--	--	--	15.1	15.5	14.3	--	--
Gwinnett Tech (13-135-0002)		16.2	16.1	16.1	16.9	14.2	12.4	11.6	12.3
Gainesville-Fair Street School (13-139-0003)		14.7	14.0	14.5	13.8	13.4	11.8	10.2	11.4
Yorkville (13-223-0003)		13.8	13.4	14.6	13.9	14.3	11.9	9.9	11.2

Source: EPA Clean Air Markets Division
* SO_2 control, required by Georgia Rule (sss), was operational on one or more EGUs for partial or full year
** Does not include emissions from facility's gas-fired units

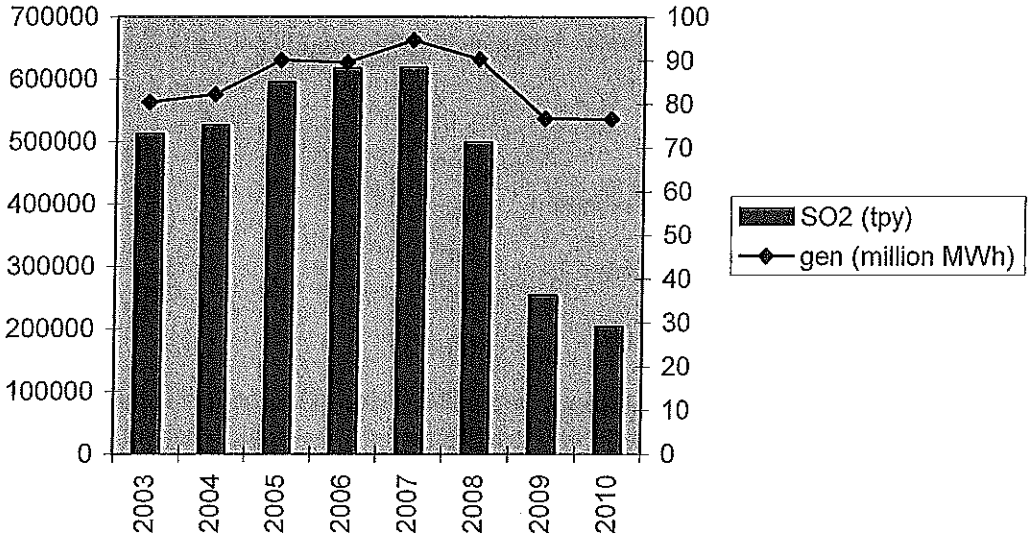


Figure 2-4. SO_2 Emissions and Generation from North Georgia Coal-fired EGU Facilities, 2003 - 2010

2.3.2.2 Smoke Management Plan

Forestry and agriculture, two of the Georgia's most significant industries, utilize prescribed burning practices to support production. Prescribed burning is the controlled application of fire to existing vegetative fuels to accomplish planned land management objectives or to mitigate catastrophic wildfires. In addition to managing forests and agricultural resources, prescribed burning helps protect lives and property by reducing accumulations of forest fuels and helps to sustain imperiled species and ecosystems. The Georgia General Assembly enacted the Georgia Prescribed Burning Act to authorize and promote the use of prescribed burning for community protection and for silvicultural, environmental, and wildlife purposes.

Large prescribed burns can produce significant $PM_{2.5}$ emissions. These emissions, if not properly managed, can reach smoke-sensitive areas and have significant negative impacts on the air quality in these areas. Smoke-sensitive areas include Georgia's heavily-populated areas and $PM_{2.5}$ nonattainment areas. Without a prescribed burning program, there is a higher probability of catastrophic wildfires, which can threaten personal property and can have even higher negative impacts on air quality.

To prevent negative air quality impacts from prescribed burning, Georgia DNR and the Georgia Forestry Commission formulated and adopted Georgia's Basic Smoke Management Plan (SMP) dated April 16, 2008. The plan was developed in accordance with EPA's "The Interim Air Quality Policy on Wildland and Prescribed Fires" and the draft EPA guidance document, "Elements of a Smoke Management Program." The purpose of the SMP is to allow fire to function in its natural role in maintaining healthy wildland ecosystems while protecting public health and welfare by mitigating the impacts of air pollutants from wildland and prescribed fires on air quality and visibility. The plan is a necessary component in determining Exceptional Events related to prescribed burning and is an element of Georgia's Regional Haze SIP. The Georgia Forestry Commission (GFC), Georgia DNR's EPD, and Georgia DNR's Wildlife Resources Division (WRD) signed a Memorandum Of

Understanding (MOU) to implement the SMP on April 16, 2008. The SMP and the MOU are included as Appendix B.

The SMP identifies the following components that should be considered in the planning of prescribed burns:

- smoke mitigation,
- smoke dispersion evaluation,
- public notification, and
- air quality monitoring.

Smoke mitigation, smoke dispersion evaluation, and air quality monitoring are important to mitigating the effects of prescribed burns on air quality in smoke-sensitive areas. Smoke mitigation is accomplished by avoiding smoke-sensitive areas, performing burns under favorable smoke dispersion conditions, and managing the generation and release of emissions over time. Smoke dispersion evaluations are performed by GFC-certified prescribed fire managers and are supported by the GFC's full-time fire weather meteorologist. Air quality monitoring and forecasting, performed by Georgia EPD, provides important air quality data to assist fire managers with their decisions on when to schedule prescribed burns.

In addition to mitigating the impacts of prescribed burns on air quality, the implementation of a SMP has benefits with regard to the computation of air quality design values. Design values are statistical measures of historical ambient pollutant concentrations that are compared to EPA's air quality standards to determine if attainment of the standard has been achieved. An atypical event, such as an unusually large forest fire, can produce $PM_{2.5}$ emissions that will significantly increase ambient concentration measurements, and therefore design value computations, in a nonattainment area. EPA will allow the atypical ambient measurements to be excluded from the design value computation if the fire event is deemed to be an "exceptional event". In order for a large fire to qualify as an exceptional event, the EPA has stated that a state must demonstrate that a certified SMP was in place at the time of the event, or that the state must ensure that the burner employs basic smoke management practices.

All outdoor burning is subject to enforcement through law enforcement officers of GFC, DNR and local law enforcement. The enforcement authority is the Georgia Forest Fire Protection Act, as well as EPD's authority to enforce Federal and State air quality regulations and laws. In addition, GFC has the authority to void certification of certified prescribed burners if investigation reveals that disregard for basic smoke management practices contributed to smoke intrusion into a smoke-sensitive area. This measure is State enforceable. It is not necessary for the continued maintenance of attainment in the Atlanta area. However, implementation of the SMP will support the maintenance of the annual $PM_{2.5}$ NAAQS.

2.3.3 Federal Control Measures

Federal control measures related to ambient $PM_{2.5}$ are focused on the reduction of emissions associated with sulfates, nitrates, and direct PM. Federal measures that targeted reduction of these emissions between nonattainment designation and the clean data period are as follows:

- Clean Air Interstate Rule/Cross State Air Pollution Rule;
- Tier 2 Vehicle Standards;
- Heavy-duty Gasoline and Diesel Highway Vehicles Standards and Ultra-Low Sulfur Diesel (ULSD) Rule;
- Large Nonroad Diesel Engines Rule and ULSD Rule;
- Non-Road Spark Ignition Engines and Recreational Engines Standard; and
- NO_x SIP Call in Surrounding States.

All of the measures were in place prior to 2007, with the exception of the large nonroad diesel rule (effective in 2008) and CAIR. Reductions associated with vehicles and engines will increase during the maintenance period as older engines are removed from service and replaced by new engines.

Table 2-6 shows the timetable of implementation of these measures as well as the species controlled by each. The continuous drop in $PM_{2.5}$ concentration from 2005 through 2010 demonstrates that the improvement of air quality is due to the implementation of the control measures. Detailed discussions of the measures are presented in the following subsections.

Table 2-6. Timetable of Federal Measure Implementation

$PM_{2.5}$ ann. avg. (µg/m3), Atlanta Area Monitors		**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Forest Park-Georgia DOT (13-063-0091)		16.0	16.8	16.6	16.7	15.3	13.7	11.5	13.4
Kennesaw-National Guard (13-067-0003)		16.0	15.8	16.3	16.5	15.3	13.5	11.2	12.2
Powder Springs-Macland Aquatic Center (13-067-0004)		15.2	15.2	15.5	15.8	14.5	13.1	10.3	12.1
South DeKalb (13-089-0002)		15.0	16.1	15.5	15.4	14.8	12.7	11.4	12.3
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E. Rivers School (13-121-0032)		16.1	16.1	15.9	15.4	15.7	13.0	11.6	12.2
Fire Station No. 8 (13-121-0039)		17.7	17.6	17.0	18.4	--	7.6	12.1	14.5
Georgia Tech (13-121-0048)		--	--	--	15.1	15.5	14.3	--	--
Gwinnett Tech (13-135-0002)		16.2	16.1	16.1	16.9	14.2	12.4	11.6	12.3
Gainesville-Fair Street School (13-139-0003)		14.7	14.0	14.5	13.8	13.4	11.8	10.2	11.4
Yorkville (13-223-0003)		13.8	13.4	14.6	13.9	14.3	11.9	9.9	11.2

Measure	Species controlled	2003	2004	2005	2006	2007	2008	2009	2010
Clean Air Interstate Rule (CAIR)	NO_x*								
Tier 2 vehicle standards	NO_x								
Heavy Duty Engine Standard, first phase	NO_x, VOC								
Heavy Duty Engine Standard, second phase, and ULSD	PM, SO_2								
Large Nonroad Diesel Rule and ULSD	PM, NO_x, SO_2								
Nonroad Spark Ignition and Recreational Vehicle	NO_x, VOC, CO								
NO_x SIP Call in Surrounding States	NO_x								

* also requires SO_2 controls after 2009

2.3.3.1 Clean Air Interstate Rule

On May 12, 2005, the U.S. EPA promulgated the "Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule)" referred to as CAIR. This rule established the requirement for States to adopt rules limiting the emissions of NO_x and sulfur dioxide (SO_2) and a model rule for the states to use in developing their rules. The purpose of the CAIR was to reduce interstate transport of precursors to fine particulate and ozone.

The CAIR rule applied to fossil-fuel-fired electric generation units (EGUs), including certain cogeneration units, with nameplate capacities of greater than 25 MWe. This rule set annual state caps for NO_x and SO_2 in two phases, with the Phase I caps starting in 2009 and 2010, respectively. Phase II caps for NO_x and SO_2 were to become effective in 2015.

As part of the CAIR rule, EPA determined that Georgia contributed significantly to downwind $PM_{2.5}$ nonattainment areas and/or interfered with maintenance of the $PM_{2.5}$ NAAQS (70 FR 25246-25250). Accordingly, a State CAIR rule [Georgia rule 391-3-1-.02(13)] was promulgated that, for the most part, mirrors the provisions of the federal rule.

On July 11, 2008, the U.S. District Court of Appeals in the District of Columbia vacated the Clean Air Interstate Rule and remanded it to EPA. A rehearing of the Court's decision was requested and granted. On December 23, 2008, the court remanded CAIR to EPA without vacatur (i.e., the rule was still in place). EPA was directed to correct the deficiencies in CAIR that were identified in the court's decision.

To replace CAIR, EPA promulgated the final Cross-State Air Pollution Rule (76 FR 48208) on August 8, 2011. The Cross-state rule imposes restrictions on emissions of NO_x and SO_2 from states identified as having significant impacts on ozone and/or $PM_{2.5}$ NAAQS attainment or as interfering with maintenance of these same standards in downwind states. The requirements of the Cross-state Rule were to become effective in 2012 and 2014, which is beyond the 2008-to-2010 clean data period for the metro Atlanta area. However, on December 30, 2011, the U.S. Court of Appeals for the D.C Circuit Court issued a ruling to stay CSAPR pending judicial review. Regardless of the timing of the transition from CAIR to CSAPR, or the resulting court-ordered interstate transport remedy, emissions of NO_x and SO_2 have declined significantly and are expected to continue to decrease in the future due to the continuation of CAIR and Georgia's own EGU emission rules.

2.3.3.2 Tier 2 Vehicle Standards and Low-Sulfur Gasoline

Federal Tier 2 vehicle standards will reduce NO_x emissions from passenger vehicles. The standards require all passenger vehicles in a manufacturer's fleet, including light-duty trucks and sport utility vehicles (SUVs), to meet an average standard of 0.07 grams of NO_x per mile. Implementation began in 2004 and was completely phased in by 2007. The Tier 2 standards will also cover passenger vehicles over 8,500 pounds gross vehicle weight rating (the larger pickup trucks and SUVs), which are not covered by the current Tier 1 regulations. For these vehicles, the standards were phased in beginning in 2008 with full compliance in 2009. The new standards require vehicles to be 77% to 95% cleaner than those on the road prior to implementation of Tier 2. The Tier 2 rule also reduced the sulfur content of gasoline to 30 parts per million (ppm) starting in January of 2006. Sulfur occurs naturally in gasoline but interferes with the operation of catalytic converters on vehicles resulting in higher emissions. Lower-sulfur gasoline is necessary to achieve the Tier 2 vehicle emission standards.

2.3.3.3 Heavy-Duty Gasoline and Diesel Highway Vehicles Standards & Ultra Low-Sulfur Diesel Rule

New U.S. EPA standards designed to reduce NO_x and VOC emissions from heavy-duty gasoline and diesel highway vehicles (14001 pounds or more) began to take effect in 2004. A second phase of standards and testing procedures, which began in 2007, will reduce particulate matter from heavy-duty highway engines and will also reduce highway diesel fuel sulfur content to 15 ppm to prevent damage to the emission control devices. The total program is expected to achieve a 90% reduction in particulate matter (PM) emissions and a 95% reduction in NO_x emissions for these new engines using low sulfur diesel, compared to older engines using diesel with higher sulfur content. SO_2 emissions will also be reduced due to the lower fuel sulfur content.

2.3.3.4 Large Nonroad Diesel Engines Rule & Ultra Low-Sulfur Diesel Rule

In May 2004, the U.S. EPA promulgated new rules for large nonroad diesel engines, such as those used in construction, agricultural, and industrial equipment, to be phased in between 2008 and 2014. The nonroad diesel rules also reduce the allowable sulfur in nonroad diesel fuel by over 99%. Prior to 2006, nonroad diesel fuel averaged about 3,400 ppm sulfur. The rule limits nonroad diesel sulfur content to 500 ppm in 2006 and 15 ppm in 2010. The combined engine and fuel rules would reduce NO_x and PM emissions from large nonroad diesel engines by over 90%, compared to older engines using diesel with higher sulfur content. SO_2 emissions will also be reduced due to the lower fuel sulfur content.

2.3.3.5 Nonroad Large Spark-Ignition Engines and Recreational Engines Standard

This standard, effective in July 2003, regulates NO_x, hydrocarbons (HC) and carbon monoxide (CO) for groups of previously unregulated nonroad engines. The new standard applies to all new engines sold in the United States and imported after these standards began and apply to large spark-ignition engines (forklifts and airport ground service equipment), recreational vehicles (off-highway motorcycles and all-terrain-vehicles), and recreational marine diesel engines. The regulation varies based upon the type of engine or vehicle.

The large spark-ignition engines contribute to ozone formation and ambient CO and PM levels in urban areas. Tier 1 of this standard was implemented in 2004 and Tier 2 started in 2007. Like the large spark-ignition engines, recreational vehicles contribute to ozone formation and ambient CO and PM levels. For the off-highway motorcycles and all-terrain-vehicles, model year 2006, the new exhaust emissions standard was phased-in by 50% and for model years 2007 and later at 100%. Recreational marine diesel engines over 37 kilowatts are used in yachts, cruisers, and other types of pleasure craft. Recreational marine engines contribute to ozone formation and PM levels, especially in marinas. Depending on the size of the engine, the standard began phasing in during 2006.

When all of the nonroad spark-ignition engines and recreational engines standards are fully implemented, an overall 72% reduction in HC, 80% reduction in NO_x, and 56% reduction in CO emissions are expected by 2020. These controls will help reduce ambient concentrations of ozone, CO, and fine PM.

2.3.3.6 NO_x SIP Call in Surrounding States

In October 1998, the U.S. EPA made a finding of significant contribution of NO_x emissions from certain states and published a rule that set ozone season NO_x budgets for the purpose of reducing regional transport of ozone (63 FR 57356). This rule, referred to as the NO_x SIP Call, called for ozone season controls to be put on utility and industrial boilers, as well as internal combustion engines in 22 states in the Eastern United States. A NO_x emissions budget was set for each state and the states were required to develop rules that would allow the state to meet their budget. A NO_x trading program was established, allowing sources to buy credits to meet their NO_x budget as opposed to actually installing controls. The emission budgets were to be met by the beginning of 2004.

2.3.4 SO_2 Emissions Reductions in Upwind States

As noted previously, secondary sulfate concentrations in a given location can be significantly affected by SO_2 emissions from distant sources. During the period of 2003 through 2009, SO_2 emissions from coal-fired electric generation facilities upwind of Georgia have been significantly reduced.

EPA promulgated the Cross-State Air Pollution Rule (76 FR 48208) on August 8, 2011, and projected future emissions to support the rulemaking. Modeling in support of the Cross-State Rule has established linkages between emissions from upwind states and ambient $PM_{2.5}$ concentrations in downwind receptor states. EPA's projections indicate that 2012 emissions for the base case (which disallows reductions from existing or future CAIR controls) from ten upwind states will contribute 0.15 $\mu g/m^3$ (1% of the 1997 annual $PM_{2.5}$ standard) or more to ambient $PM_{2.5}$ concentrations in Georgia's 2012 projected nonattainment area (Atlanta). The ten states are Alabama, Illinois, Indiana, Kentucky, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and West Virginia. [Source: Appendix D of the Air Quality Modeling Final Rule Technical Support Document, June 2011, docket item EPA-HQ-OAR-2009-0491-4140.]

Table 2-7 shows the SO_2 emissions trends from coal-fired EGU facilities in the ten upwind states during the period 2003 through 2009. The total SO_2 emissions from the ten states dropped approximately 15 percent from 2003 to 2007 and over 50 percent from 2003 to 2009. The trend of aggregated SO_2 emissions from these states is presented in Figure 2-6.

Table 2-7. Annual SO_2 Emissions in States With Downwind Contributions to Georgia $PM_{2.5}$ Exceeding 0.15 µg/m^3

State	2003	2005	2007	2009
AL	458,622	460,072	447,189	277,972
IL	365,333	326,632	272,571	229,364
IN	804,829	870,812	714,529	413,726
KY	529,559	500,224	379,837	252,002
NC	462,041	500,936	370,826	110,948
OH	1,175,905	1,085,485	954,646	600,687
PA	967,185	985,508	951,186	573,618
SC	203,956	217,386	172,726	97,941
TN	339,536	266,081	237,231	108,042
WV	539,858	467,082	371,996	174,583
TOTAL	5,846,824	5,680,218	4,872,738	2,838,883

Source: EPA Clean Air Markets Division, Acid Rain Program

EPD understands that the emissions reductions in the upwind states are not permanent and enforceable reductions in Georgia. However, we believe that the reductions provide further evidence that the reduced $PM_{2.5}$ levels in Georgia during the period 2008-2010 are due to SO_2 emissions reductions achieved both within and outside Georgia. The majority of upwind reductions is due to state rules or consent orders requiring reduced SO_2 emissions. With the promulgation of the Cross-State Air Pollution Rule, it is highly unlikely that these reductions will be reversed in the future. (It should be noted that on December 30, 2011, the U.S. Court of Appeals for the D.C Circuit Court issued a ruling to stay CSAPR, pending judicial review. Regardless of the timing of the transition from CAIR to CSAPR, or the resulting court-ordered interstate transport remedy, emissions of SO_2 from upwind states have declined significantly and are expected to continue to decrease in the future.)

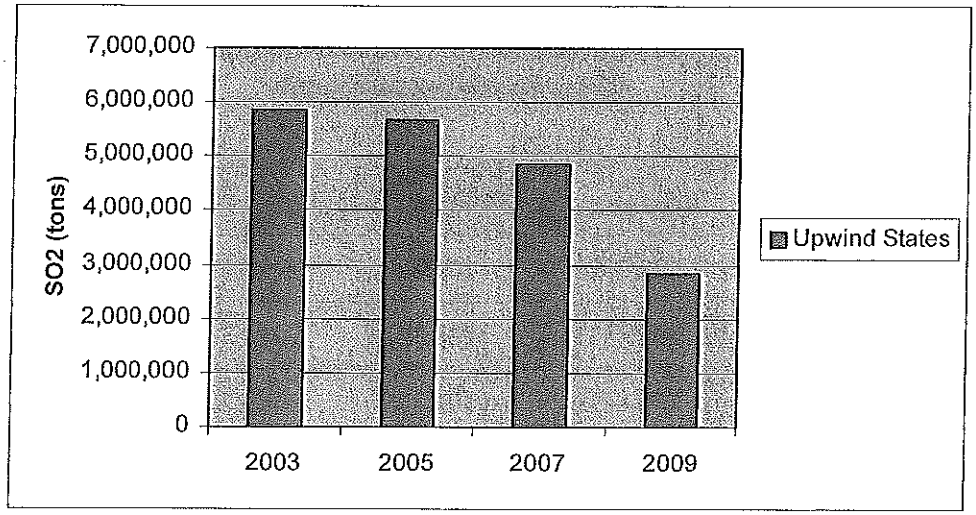

Figure 2-5. Trend of Aggregated Annual SO_2 Emissions in States with Downwind Contributions to Georgia $PM_{2.5}$ Exceeding 0.15 µg/m^3

2.4 Section 110 and Part D Requirements

Section 110 of the CAA contains the requirements for state implementation plans (SIPs). The purpose of a SIP is to provide for the implementation, maintenance, and enforcement of national primary ambient air quality standards. Part D, Subpart 1, of CAA Title I (Sections 171 to 179) contains general requirements for areas that have been designated nonattainment. As stated in Section 1.1 of this maintenance plan, the Atlanta area was designated as nonattainment for the 1997 annual fine PM standard in April of 2005.

Georgia EPD submitted a $PM_{2.5}$ nonattainment plan for the Atlanta area per Title I Part D. With the determination that the Atlanta nonattainment area has attained the 1997 annual fine PM standard (Section 2.1.3), the area is no longer subject to the nonattainment provision of CAA Section 110 and Part D requirements for demonstrating attainment, RFP, associated RACM and contingency for areas designated as nonattainment with the NAAQS. Therefore, the nonattainment plan was subsequently withdrawn. All other Section 110 and Part D requirements pertaining to the Atlanta area have previously been approved or are currently subject to approval by EPA.

3.0 Maintenance Plan

Section 175A of the Clean Air Act Amendments of 1990 defines the general framework of a maintenance plan. The core provisions of Section 175A are a quantitative demonstration of maintenance of the standard ($PM_{2.5}$ in this case) and contingency provisions for prompt adoption of corrective measures if attainment is not maintained. Per guidance from EPA,[4] this maintenance plan includes a method to verify continued attainment to support the maintenance demonstration. Per the same guidance, this plan also includes a plan to use the ambient monitoring network for verification of continued attainment or, if applicable, for triggering contingency provisions.

3.1 Maintenance Demonstration

Section 175A of the CAA requires a state that is requesting redesignation to submit a revision to its SIP which provides for maintenance of the applicable standard for a minimum of 10 years after the redesignation date. Section 107(d)(3)(D) provides EPA up to 18 months from receipt of a complete submittal to process a redesignation request. Therefore, Georgia EPD is providing a demonstration of maintenance through the year 2024.

There are two generally-accepted methodologies for demonstrating maintenance. Under the first method, an emissions inventory is compiled for one of the three years which are used to show clean (i.e., attaining) ambient data (see Section 2.1). This year is the baseline or attainment year. Emissions projections are formulated for the final year of the maintenance period and for intermediate years. If each of the projected emission levels is less than the emission level for the attainment year, maintenance of the standard is demonstrated. This assumes that ambient concentrations will remain below the standard if future annual emissions are kept below the inventoried emissions in the chosen attainment year. Under the second maintenance demonstration method, air quality modeling is used to project ambient pollutant concentrations and annual design values for the final year and intermediate years. If all of the modeled, rolling 3-year averages of the annual design values are below the standard, maintenance is demonstrated.

Georgia EPD has adopted the method of comparing attainment year emissions to projected emissions for this maintenance plan. This approach has been used in the previous maintenance plans submitted by EPD and approved by EPA. The following sections discuss the attainment year inventory, the projected inventories, and verification of continued attainment.

3.1.1 Attainment Year Emissions Inventory

Georgia EPD has selected 2008 as the year for the attainment year emissions inventory. 2008 is one of the three years (2008–2010) on which the Atlanta area's clean data determination is based. Most of the 2008 base-year emission inventory was obtained from the National Emissions Inventory 2008 Version 1.5 (NEI2008, http://www.epa.gov/ttnchie1/net/2008inventory.html). The following emissions sectors are included in the inventory:

[4] "Procedures for Processing Requests to Redesignate Areas to Attainment", September 4, 1992, John Calcagni, Director, Air Quality Management Division, OAQPS, USEPA

- Point sources (EGU and non-EGU),
- Nonpoint sources (including fire),
- Onroad mobile sources, and
- Nonroad mobile sources (including marine vessels, aircraft, and rail).

The data sources for the attainment-year emissions inventories are summarized in Table 3-1. Additional details on the data sources and inventory methods are presented in the following subsections and in Appendix C.

Table 3-1. 2008 Emissions Inventory Sources

Emissions Source Sector	Inventory Source
Point – EGU	NEI2008 Version 1.5
Point – non-EGU	NEI2008 Version 1.5
Nonpoint	NEI2008 Version 1.5
Onroad Mobile	ARC MOVES2010
Nonroad Mobile	NEI2008 Version 1.5

3.1.1.1 Point Sources

Point sources captured in the inventory include stationary sources whose actual emissions equal or exceed 100 tons per year of SO_2, NO_x, or particulate matter. Emissions from point sources have been calculated for EGU and non-EGU sources.

EGU Point Sources:

The nonattainment area has six EGU facilities located within its boundaries that report their emissions for the emissions inventory. Three facilities, Doyle Generating (AIRS No. 29700041), MPC Generating (AIRS No. 29700040), and Walton County Power (AIRS No. 29700042) operate natural gas-fired combustion turbines and fall below the reporting threshold for the emission inventory, thus they have never reported emissions to the Division. Table 3-2 summarizes emissions from each EGU located in the nonattainment area that is required to report its emissions for the emission inventory.

Table 3-2. Emissions by EGU facilities in 2008, 2017 and 2024

Facility Site Name	AIRS ID	2008			2017			2024		
		SO_2	NO_X	PM_{25}	SO_2	NO_X	PM_{25}	SO_2	NO_X	PM_{25}
Chattahoochee Energy Facility	14900006	5	97	89	4	86	79	5	103	94
GA Power Company - Plant Bowen	01500011	149,015	25,360	2,003	8,781	7,763	1,219	9,123	8,066	1,267
GA Power Company - Plant Branch	23700008	93,982	20,194	445	4,972	3,740	236	5,166	3,885	245
GA Power Company - Plant McDonough/Atkinson	06700003	24,330	3,489	202	25	451	283	29	536	336
GA Power Company - Plant Wansley	14900001	74,956	14,625	1,866	4,086	4,116	1,069	4,246	4,299	1,119
GA Power Company - Plant Yates	07700001	68,208	12,413	333	30,648	6,557	285	31,844	6,813	297
Total		410,496	76,177	4,937	48,517	22,713	3,171	50,414	23,702	3,358

Non-EGU Point Sources:

2008 emissions of SO_2, NO_x, and $PM_{2.5}$ from EGU and non-EGU facilities are presented in Table 3-3. Chemical Products Corporation in Bartow County is the largest source of SO_2 emissions from non-EGU point sources in the Atlanta Area, while Owens Corning Insulating Systems LLC, is the largest source of $PM_{2.5}$ emissions from non-EGU point sources.

Table 3-3. Point Source Emissions for 2008 (tons, annual)

Pollutant	EGU	Non-EGU	Total Point
SO_2	410,496	2,982	413,478
NO_x	76,177	4,608	80,785
$PM_{2.5}$	4937	700	5637

The 2008 point source inventory is based on the National Emissions Inventory (NEI) reports for reporting year 2008. Emissions from sources that reported for 2008 were generally used as reported. See Appendices C and C-1 for more details on the development of the 2008 point source emissions inventory.

3.1.1.2 Nonpoint Sources

Nonpoint sources captured in the inventory include stationary sources whose emissions levels of SO_2, NO_x, and particulate matter are each less than 100 tons per year. Emissions estimates for non-EGU point sources in 2008 were obtained from NEI2008 Version 1.5.

The 2008 nonpoint source emissions for the Atlanta area are presented in Table 3-4. The largest contributors to SO_2 emissions were coal-fired and residual-oil-fired industrial boilers. The largest contributors to NO_x emissions were industrial wood-fired boilers and Class I diesel railroad line haul locomotives. The largest contributors to $PM_{2.5}$ emissions were industrial wood-fired boilers and road dust from unpaved roads.

Emissions from fires in 2008 were also obtained from NEI2008 Version 1.5 and are shown in Table 3-4. These estimates were provided by Georgia Environmental Protection Division as part of the AERR2008 submission (Georgia Air Protection Branch, 2011). This inventory was developed using 2008 burned-area data and burning permit data provided by Georgia Forestry Commission, and the same method as used for the VISTAS2002 fire inventory.

Table 3-4. Nonpoint Source Emissions for 2008 (tons, annual)

Pollutant	Nonpoint (excluding fire)	Fire	Total Nonpoint
SO_2	10,203	34	10,237
NO_x	20,992	201	21,193
$PM_{2.5}$	34,921	765	35,686

The 2008 level of $PM_{2.5}$ emissions from nonpoint sources, excluding fire, was 34,921 tons. This quantity accounted for over 50 percent of total $PM_{2.5}$ emissions in the Atlanta area. The top three nonpoint source classifications for $PM_{2.5}$ emissions were industrial wood-fired boilers, dust from unpaved roads, and dust from paved roads (see Table 3-5).

Table 3-5. Largest Nonpoint $PM_{2.5}$ Emissions by Source Classification

SCC	Description	2008 $PM_{2.5}$ (tons)
2102008000	Stationary Fuel Comb /Industrial /Wood /Total: All Boiler Types	12,192.03
2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	10,421.06
2294000000	Paved Roads /All Paved Roads /Total: Fugitives	2627.17

3.1.1.3 Onroad Mobile Sources

U.S. EPA's MOVES2010a mobile source emissions model was run in inventory mode to generate 2008 on-road mobile source emissions of SO_2, NO_x, and $PM_{2.5}$. The 2008 onroad mobile source emissions for the Atlanta area are presented in Table 3-6.

Table 3-6. Onroad Mobile Source Emissions for 2008 (tons, annual)

Pollutant	Onroad Emissions
SO_2	725.14
NO_x	128,954.56
$PM_{2.5}$	4,661.88

The following non-default inputs to the MOVES model were used:

- registration distribution by age,
- vehicle population,
- vehicle miles traveled (VMT), and
- hourly temperature and relative humidity.

SO_2, NO_x and $PM_{2.5}$ emissions from onroad mobile sources in 2008 and 2024 were developed by the Atlanta Regional Commission using MOVES2010a. MOVES was run separately for two groups of twenty nonattainment counties in Atlanta in inventory mode. The two groups of counties have different I/M program requirements, and they are the Atlanta 13-county area and the Atlanta 7-county area.

Average 2008 annual daily meteorological inputs were used. Best available local data were used for MOVES inputs such as vehicle population, vehicle miles traveled (VMT) by source types, road type distribution, speed distributions, ramp fractions, hourly VMT fractions and age distribution.

Since there is no public road in the nonattainment part of Heard County, MOVES was not run for Heard County. MOVES was run for whole county of Putnam, and the emissions in the partial nonattainment area were calculated using human population fraction. Local vehicle population and VMT were used for the Putnam County inputs. Please refer to the document "MOVES-Based Mobile Source Emissions Modeling for the Atlanta Nonattainment Area" provided by the Atlanta Regional Commission in Appendix C-7 for more detailed information.

3.1.1.4 Nonroad Mobile Sources

The nonroad sector is comprised of nonroad engines included in EPA's NONROAD model, such as recreational marine and land-based vehicles, farm, construction and industrial machinery, and lawn and garden equipment. This sector also includes engines not modeled in NONROAD, specifically aircraft, commercial marine vessels, and locomotives.

Emissions from aircrafts and locomotives in 2008 were obtained from NEI2008 Version 1.5 (http://www.epa.gov/ttnchie1/net/2008inventory.html). Emissions from yard locomotives were not included in the NEI2008, and were obtained from Eastern Regional Technical Advisory Committee (ERTAC) separately. There were no emissions from commercial marine vessels in the Atlanta $PM_{2.5}$ nonattainment area.

Table 3-7. Nonroad Mobile Source Emissions for 2008 (tons, annual)

Pollutant	Nonroad - except air and rail	Aircraft	Locomotive	Total Nonroad
SO_2	474	1,142	59	1675
NO_x	24,616	10,189	5794	40,599
$PM_{2.5}$	2351	293	183	2827

3.1.1.5 Summary of 2008 Emissions Inventory

The total 2008 Atlanta nonattainment area emissions of SO_2, NO_x, and $PM_{2.5}$ are presented for each source sector in Table 3-8. The majority of SO_2 emissions, by far, are from point sources. The majority of NO_x emissions are from point and onroad mobile sources. The majority of $PM_{2.5}$ emissions are from nonpoint and point sources.

Table 3-8. Attainment-year (2008) Emissions Inventory (tons, annual)

Pollutant	Point Total	Point EGU	Point Non-EGU	Nonpoint	Onroad Mobile	Nonroad Mobile	Total
SO_2	413,478	410,496	2,982	10,237	725	1,675	426,115
NO_x	80,785	76,177	4,608	21,193	128,955	40,599	271,531
$PM_{2.5}$	5,637	4,937	700	35,686	4,662	2,827	48,811

3.1.2 Projected Emissions Inventories

As discussed previously, Georgia EPD is providing a demonstration of maintenance through the year 2024 (the maintenance year). Emissions projections to support maintenance through 2024 have been prepared for the years 2017 and 2024. In addition, emissions have been calculated by interpolation for the years 2014 and 2020. Emissions for these additional years provide additional reference points for periodic assessment of maintenance of the standard. Maintenance period emissions controls, projection methods, and projected inventories are discussed in the remainder of this subsection.

3.1.2.1 Methods and Projected Inventories

Projected emissions inventories are calculated by applying applicable control and growth factors to the 2008 emissions of individual sources or source categories. The control and growth factors may apply for some or all of the years 2008 (year following attainment inventory) through 2024 (out year). The bases used to determine these factors are summarized in Table 3-9.

Table 3-9. Bases of Control and Growth Factors for 2017 and 2024 Inventories

Source Category	Control Basis	Growth Factor Basis
Point – EGU	Implementation of GA Rule (sss) for SO_2 and NO_x controls; VISTAS 2012 projection inventory	Coal consumption forecasts in 2010 Annual Energy Outlook (AEO)
Point – non-EGU	Regulatory review - no additional controls defined at this time	EGAS growth factors by SCC and county for 2017 and 2024.
Nonpoint	Regulatory review - no additional controls defined at this time	EGAS growth factors by SCC for 2017 and 2024.
Nonpoint – fire	No additional controls anticipated	No growth anticipated
Onroad Mobile	MOVES inventory mode ($PM_{2.5}$, NO_x, SO_2) for 2024. All known Federal controls.	MOVES inventory mode ($PM_{2.5}$, NO_x, SO_2) for 2024. Vehicle population growth from human population projections. Vehicle miles traveled (VMT) growth from Georgia DOT.
Nonroad Mobile	NMIM 2008	NMIM 2008
Nonroad Mobile – marine, aircraft, and rail	SEMAP (Pechan) control factors by SCC for 2017 and 2024	SEMAP (Pechan) growth factors by SCC for 2017 and 2024

The pollutants whose emissions are projected are SO_2, NO_x, and direct $PM_{2.5}$. As with the attainment inventory, emissions from the following sectors are projected:

- Point sources (EGU and non-EGU),
- Nonpoint sources (including fire),
- Onroad mobile sources, and
- Nonroad mobile sources (including marine vessels, aircraft, and rail).

The projected inventories are presented in the following subsections. The methods used to develop the emissions projections are presented in more detail in Appendix C.

3.1.2.2 Point Sources

EGU Point Sources:

EGU point source emissions in 2017 and 2024 were estimated using growth factors and control factors. Growth factors were calculated based on coal consumption for the southeastern region in the Energy Information Administration's AEO2010 report. The control factors varied with pollutants. The SO_2 control factor associated with Flue Gas Desulfurization (FGD) was assumed to be 95% according to VISTAS 2012 Projection Emissions Inventory. The NO_x control factor associated with Selective Catalytic Reduction (SCR) was assumed to be 82.5% according to VISTAS 2012 Projection Emissions Inventory. The $PM_{2.5}$ control factor associated with FGD was assumed to be 50% according to Table 5.4-1 on page 5.4-24 of the EPA document "Stationary Source Control Techniques Document for Fine Particulate Matter" (EC/R Incorporated, 1998). When FGD or SCR controls were already operated fully or partially at a unit during year 2008, the control factors were only applied to uncontrolled emissions in 2008. These periods were identified using CAMD hourly CEM data for NO_x and SO_2 emissions and heat inputs. Days without control operation were identified as those days on which the ratio of NO_x or SO_2 emissions to heat input exceeded 0.00004 lbs/mmBtu according to correlation analysis results. In addition, NO_x emissions during the period from October 1, 2008, to December 31, 2008, from Plant Bowen Unit 3 were projected to future years using a different method, since the actual NO_x control efficiency in this period was approximately 60% according to hourly CEM data analysis. Such NO_x emissions were first adjusted to reflect before control emissions and then apply the 82.5% NO_x emissions control factor for future year emissions projection.

The SO_2 control factor due to Flue Gas Desulfurization (FGD) was assumed to be 95% according to the VISTAS 2012 Projection Emissions Inventory (see Appendices C and C-6). In 2008, Plant McDonough operated two coal-fired EGUs (Units 1 and 2) with a combined generating capacity of 530 MW. Due to the requirements specified in Georgia's Rule 391-3-1-.02(2)(sss) for EGU controls, Georgia Power shut down Unit 2 by the fourth quarter of 2011 and Unit 1 by the second quarter of 2012. Unit 2 was replaced with two gas-fired combined cycle blocks (Blocks 4 and 5), and Unit 1 was be replaced by one gas-fired, combined cycle block (Block 6). Each block consists of two generating units, with each unit consisting of a combustion turbine and a duct burner. The combined generation capacity of the three blocks (six units) is 840 MW. Two of the six combustion turbines are permitted to burn distillate oil (0.0015 % sulfur) up to 1000 hours/year each. NO_x emissions from each unit are controlled by an SCR and a low-NO_x burner.

As noted in Subsection 2.3.3, EPA promulgated CSAPR in 2011, but the rule was stayed later in the year. When the rule was promulgated, Georgia was identified as a covered state and, therefore, would have been required to comply with statewide allocations of SO_2 and/or NO_x emissions from covered EGUs starting in 2012. The future of the rule is not known at this time; therefore, the rule's requirements have not been incorporated into the emissions projections presented here. Any further reductions that may ultimately be required by the Cross-State Rule will only strengthen the case for maintenance of the NAAQS as documented in this plan.

Forecasts of NO_x emissions from McDonough's Blocks 4, 5, and 6 were calculated by assuming that actual rolling 12-month emissions will be 75% of the permitted limits. It was assumed that the duration of operation for these gas-fired units will not push NO_x emissions beyond 75% of their 12-month permit caps. It was also assumed that the two affected combustion turbines would burn oil for 500 hours per year each. Growth factors were calculated for McDonough-Atkinson using the same fuel consumption approach that is described above, subject to the constraint that annual emissions cannot rise above the permitted 12-month limits.

Projected EGU point source emissions are presented in Table 3-10. The projections show a dramatic reduction in SO_2 emissions as well as significant reductions in NO_x and $PM_{2.5}$ emissions. Emissions levels for 2014 were calculated by linear interpolation between 2008 and 2017. Emissions levels for 2020 were calculated by linear interpolation between 2017 and 2024.

Table 3-10. Projected Point Source Emissions (tons)

Pollutant	*2008 (attainment)*	2014	2017	2020	2024
EGU					
SO_2	410,496	169,056	48,517	49,331	50,414
NO_x	76,177	40,517	22,713	23,138	23,702
$PM_{2.5}$	4,937	3,759	3,171	3,251	3,358
Non-EGU					
SO_2	2,982	3,115	3,181	3,270	3,389
NO_x	4,608	4,972	5,154	5,397	5,721
$PM_{2.5}$	700	781	822	868	930
Total Point					
SO_2	413,478	172,170	51,697	52,601	53,803
NO_x	80,785	45,489	27,867	28,535	29,423
$PM_{2.5}$	5,637	4,541	3,993	4,120	4,288

Non-EGU Point Sources:

Projected non-EGU point source emissions for each facility in 2017 and 2024 can be found in Appendix C-3. The emissions for 2017 and 2024 were estimated using SCC-specific and county-specific growth factors generated with EPA's Economic Growth Analysis System Version 5.0 (EGAS 5.0). Appendix C-2 contains the SCC-specific growth factors for the Atlanta area. The projections show moderate increases in emissions of all three pollutants. No additional future controls can be defined for non-EGU point sources at this time. Emissions levels for 2014 and 2020 were calculated by interpolation as described above and can be found in Appendix C.

Projected total point source emissions (sum of EGU and non-EGU) are shown in Table 3-10. The projections show dramatic decreases in emissions of SO_2 as well as moderate decreases in emissions of NO_x and $PM_{2.5}$.

3.1.2.3 Nonpoint Sources

Nonpoint source emissions, excluding fire, in future years 2017 and 2024 were estimated using SCC- and county-specific growth factors generated with EGAS 5.0. Appendix C-2 contains the SCC-

specific growth factors for the Atlanta area. No additional future controls can be defined for these sources at this time.

Projections of nonpoint source emissions are presented in Table 3-11. Emissions from fire in future years 2017 and 2024 were assumed to be the same as 2008 emissions. The projections show a small increase in emissions of SO_2 as well as moderate increases in emissions of NO_x and $PM_{2.5}$.

Table 3-11. Projected Nonpoint Source Emissions (tons)

Pollutant	*2008 (attainment)*	2014	2017	2020	2024
Nonpoint (excluding fire)					
SO_2	10,203	10,523	10,683	10,850	11,073
NO_x	20,992	23,330	24,498	25,716	27,337
$PM_{2.5}$	34,921	39,287	41,467	43,307	45,755
Fire					
SO_2	34	34	34	34	34
NO_x	201	201	201	201	201
$PM_{2.5}$	768	765	765	765	765
Total Nonpoint					
SO_2	10,237	10,557	10,717	10,884	11,107
NO_x	21,193	23,531	24,698	25,916	27,537
$PM_{2.5}$	35,686	40,052	42,232	44,072	46,520

The top three nonpoint source classifications for 2024 $PM_{2.5}$ emissions are industrial wood-fired boilers, dust from unpaved roads, and dust from paved roads (see Table 3-12). Projected $PM_{2.5}$ emissions from these three source classifications make up over 70 percent of total projected $PM_{2.5}$ emissions.

Table 3-12. Largest Nonpoint $PM_{2.5}$ Emissions by Source Classification, Year 2024

SCC	Description	2024 $PM_{2.5}$ (tons)
2102008000	Stationary Fuel Comb /Industrial /Wood /Total: All Boiler Types	15,972
2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	13,652
2294000000	Paved Roads /All Paved Roads /Total: Fugitives	3442

3.1.2.4 Onroad Mobile Sources

EPD ran U.S. EPA's MOVES2010a mobile source emissions model in inventory mode to generate 2024 onroad mobile source emissions of SO_2, NO_x, and $PM_{2.5}$. Intermediate year emissions were generated by interpolating between 2008 and 2024. The following non-default inputs to the model were used:

- Vehicle age distribution,
- average speed distribution,
- vehicle population,
- vehicle miles traveled (VMT),
- road type distribution,
- ramp fraction, and
- hourly temperature and relative humidity.

The vehicle age distribution was based on R.L. Polk & Co. registration data. MOVES 2010 defaults were used for Heavy-Duty Diesel Vehicle Class 8B. Person population growth projections for the Atlanta metropolitan area were used to calculate the 2024 vehicle population. The 2024 annual VMT were calculated by Georgia DOT using travel demand model outputs and HPMS counts, as well as speed distribution, road-type distribution, and ramp fraction. Temperature and humidity inputs were assumed to be the same as year 2008.

The projected onroad mobile source emissions levels are presented in Table 3-13. Onroad emissions of all three pollutants trend downward significantly during the maintenance period. The trend in SO_2 is of less importance since onroad mobile sources emit very little SO_2. For a detailed discussion on how the onroad mobile emission inventory was developed, see Appendices C, C-3, and C-4.

Table 3-13. Projected Onroad Mobile Source Emissions (tons)

Pollutant (tons)	*2008 (attainment)*	2014	2017	2020	2024
SO_2	725	629	581	533	469
NO_x	128,955	93,806	76,258	58,675	35,272
$PM_{2.5}$	4662	3529	2963	2397	1642

3.1.2.5 Nonroad Mobile Sources

Projections of nonroad emissions in 2017 and 2024, excluding air and rail sources, were calculated using NMIM2008 with the same meteorological inputs as for 2008. Defaults in NMIM 2008 were used for other inputs.

Growth factors for all aircraft engine and airport-related SCCs were based on landing and take-off operation (LTO) projections available from the Federal Aviation Administration's Terminal Area Forecasts (FAA, 2010). Growth rates for military aircraft were held constant at 2008 levels. No control factors were applied to aircraft emissions.

Growth factors for freight rail sector emissions were based on fuel consumption forecasts. For passenger and commuter rail, growth factors were developed from national forecasts of intercity rail diesel consumption and commuter rail diesel consumption. Control factors were based on U.S. EPA's locomotive engine regulatory impact analysis and associated emission factor guidance.

The nonroad mobile source emissions projections are presented in Table 3-14. Total emissions of NO_x and $PM_{2.5}$ trend downward significantly during the maintenance period while SO_2 emissions slightly increase. For a detailed discussion on how the nonroad mobile emissions projections were developed, see Appendix C.

Table 3-14. Projected Nonroad Mobile Source Emissions (tons)

Pollutant	*2008 (attainment)*	2014*	2017	2020*	2024
Nonroad**					
SO_2	474		34		37
NO_x	24,616		14,240		10,252
$PM_{2.5}$	2351		1687		1288
Aircraft					
SO_2	1142		1401		1668
NO_x	10,189		12,557		14,974
$PM_{2.5}$	293		347		404
Locomotive					
SO_2	59		2		3
NO_x	5794		4037		3072
$PM_{2.5}$	183		93		63
Total Nonroad					
SO_2	1675	1516	1437	1553	1708
NO_x	40,599	34,086	30,835	29,747	28,298
$PM_{2.5}$	2827	2360	2127	1967	1755

* interpolation to 2014 and 2020 performed only for total nonroad emissions
** excluding aircraft and locomotive emissions

3.1.3 Emissions Projections Summary and Demonstration of Maintenance of Attainment

The consolidated emissions projections for all Atlanta nonattainment area sources are presented in Table 3-15. Emissions of SO_2 and NO_x drop significantly from 2008 to 2024. This is a reflection of the implementation of the majority of state and federal controls during the first half of the maintenance period. Overall, emissions of SO_2 and NO_x are projected to decline by 84.3 percent and 55.6 percent, respectively, over the course of the maintenance period.

Emissions of $PM_{2.5}$ rise slightly from 2008 through 2017 and then once again from 2017 through 2024. This is a reflection of an increase in nonpoint source emissions that is partially offset by reductions from point sources. The overall rise in $PM_{2.5}$ is 11.1 percent of attainment year emissions. Therefore, further evaluation is needed to judge whether the increase in $PM_{2.5}$ emissions, in combination with the decreases in SO_2 and NO_x emissions, is likely to provide for maintenance of the standard.

Table 3-15. Projected Emissions – Total of All Sectors (tons)

Pollutant (tons)	*2008 (attainment)*	2014	2017	2020	2024	% change, 2008-2024
SO_2	426,115	184,873	64,433	65,572	67,088	84.3
NO_x	271,531	196,912	159,659	142,873	120,530	55.6
$PM_{2.5}$	48,811	50,482	51,316	52,556	54,205	-11.1

Each of the three pollutants is characterized by a different relationship between emissions and air quality. Therefore, simply summing the emissions of the pollutants does not provide a meaningful indicator of the combined air quality impact of these emission changes. A more appropriate indicator is the percentage change in emissions for each emitted pollutant, weighted according to the air quality impact for each.

For this purpose, Georgia EPD examined speciation data available from the EPA Air Explorer Web site for 2007-2009 for the DeKalb County monitor (13-089-0002). The 3-year average of this data suggests that ambient $PM_{2.5}$ in Atlanta consists of approximately 40.7 percent sulfate; 1.2 percent nitrate; 50.1 percent organic particulate (which consists of directly-emitted primary organic matter and atmospherically formed secondary organic aerosol); 4.2 percent miscellaneous inorganic particulate (sometimes labeled "crustal particles"); and 3.7 percent other types of particulate matter. Therefore, using a conservative assumption that all of the organic particulate is primary organic matter, direct $PM_{2.5}$ species make up 54.3 percent (sum of 50.1 and 4.2) of the total ambient $PM_{2.5}$.

Georgia EPD used a conservative approach that assumes that the full ambient concentration of organic particulate matter plus miscellaneous inorganic particulate matter will vary in accordance with changes in total nonattainment area emissions of direct $PM_{2.5}$. This analysis thus assumes that the direct $PM_{2.5}$ component of ambient $PM_{2.5}$ will increase by the 11.1 percent projected increase in direct $PM_{2.5}$ emissions. This approach was used by U.S. EPA in its evaluation and approval of the annual $PM_{2.5}$ redesignation request for the Evansville, Indiana, nonattainment area (see 76 FR 29695 and 76 FR 59527).

In the Atlanta analysis, the baseline concentration is conservatively assumed to be 15.0 $\mu g/m^3$. Direct $PM_{2.5}$ is estimated to contribute 54.3 percent, or 8.1 $\mu g/m^3$, of the 15.0 $\mu g/m^3$. Georgia EPD's assessment assumes that the projected increase in direct $PM_{2.5}$ emissions will cause a corresponding 11.1 percent increase in ambient concentrations of $PM_{2.5}$, which would suggest an increase in the ambient concentration of the direct $PM_{2.5}$ component by 0.905 $\mu g/m^3$.

However, Georgia EPD believes that this potential increase will be fully offset by a greater decrease in sulfate and nitrate concentrations. The precise decrease in sulfate and nitrate concentrations is a complicated result of emissions reductions not just in Atlanta, but also in many other parts of the Eastern United States. Modeling conducted by EPA for the Cross-State Air Pollution Rule (CSAPR) estimated that future Atlanta concentrations with the final CSAPR in place (12.99 $\mu g/m^3$) would be 2.01 $\mu g/m^3$ below the standard (2014 Remedy Average case*). In addition, the emissions reductions that have already occurred have brought the maximum measured Atlanta concentrations to 13.6 $\mu g/m^3$ (as shown in Table 2-2). Therefore, the 0.905 $\mu g/m^3$ increase in the components associated with direct $PM_{2.5}$ would not be expected to yield concentrations above the standard. That is, GA EPD believes that maintenance of the annual $PM_{2.5}$ standard is demonstrated despite the small projected increase in direct $PM_{2.5}$ emissions.

* Air Quality Modeling Final Transport Rule Technical Support Document, docket item EPA-HQ-OAR-2009-0491-4140.

3.1.4 Emissions Decreases

An emissions surplus represents the degree of improvement (reduction) in 2024 emissions compared to the attainment year (2008) emissions. The surpluses are shown in Table 3-16 for each pollutant. A positive surplus reflects an emissions decrease from the attainment year to 2024. The negative surplus for $PM_{2.5}$ reflects a projected increase in emissions. A portion of the NO_x surplus will be allotted to the Motor Vehicle Emissions Budget as a safety margin (see Section 4).

Table 3-16. Emissions Decrease

Pollutant	Surplus Emissions* 2008 to 2024 (tons)
SO_2	359,028
NO_x **	151,001
$PM_{2.5}$ **	-5394

* Surplus = (2008 emissions level) – (2024 emissions level)
** These quantities do not reflect allotment to Motor Vehicle Emissions Budget

3.1.5 Verification of Continued Attainment

Items 5.c and 5.d of the September 4, 1992 EPA guidance memo outline requirements for verification of continued attainment. Verification of continued attainment is accomplished through operation of the ambient $PM_{2.5}$ monitoring network and through periodic updates of the area's emissions inventory.

The location and operation of EPD's FRM monitors in the Atlanta area are described in Section 2.1 of this plan. During the maintenance period, EPD will continue to operate federal reference monitors in the Atlanta area per the requirements of 40 CFR Part 58.

The Consolidated Emissions Reporting Rule (CERR) was promulgated by EPA on June 10, 2002. The CERR was replaced by the Annual Emissions Reporting Requirements (AERR) rule on December 17, 2008. The most recent triennial inventory for Georgia was compiled for 2008. The larger point sources of air pollution will continue to submit data on their emissions on an annual basis as required by the AERR. Emissions from the rest of the point sources, the nonpoint source portion, and the onroad and nonroad mobile sources continue to be quantified on a 3-year cycle. The inventory will be updated and maintained on a 3-year cycle. As required by the AERR, the next overall emissions inventory will be compiled for 2011.

3.2 Contingency Provisions

Section 175A(d) of the Clean Air Act requires that the maintenance plan include provisions for contingency measures that would promptly be implemented to correct a violation of the standard, should this occur, after redesignation of an area as an attainment area. The measures may include rules or other measures that are not yet effective, but EPD agrees to adopt and implement, as expeditiously as practicable, when required by this plan. The minimum requirement for contingency provisions is the implementation of all measures that were contained in the SIP for the area (i.e., the nonattainment plan) before the redesignation. In addition, EPA guidance (John Calcagni memo dated September 4, 1992) specifies the following pertaining to contingency provisions in the maintenance plan:

- identification of additional measures that would be considered for implementation should a violation occur;
- identification of triggers for the implementation of additional contingency measures; and
- a schedule and procedure for adoption and implementation of additional measures (with time limit).

3.2.1 Contingency Measure Triggers

Section 175A(d) of the Clean Air Act Amendments requires that the maintenance plan include provisions for contingency measures that would promptly be implemented by the state to correct any violation of the annual $PM_{2.5}$ NAAQS after redesignation of an area as an attainment area. A list of potential contingency measures that could be considered for future implementation in such an event should also be included in the maintenance plan.

EPD has developed a contingency plan for the Atlanta $PM_{2.5}$ maintenance area. Contingency measures are intended to provide further emission reductions in the event that violations of the NAAQS occur after redesignation to attainment. Consistent with this plan, EPD agrees to adopt and

implement, as expeditiously as practicable, the necessary corrective actions in the event that violations of the standard occur within the maintenance area after redesignation to attainment. Contingency measures as described below would be adopted and implemented within 24 months of a contingency trigger unless EPD has demonstrated that technical or economic feasibility warranted a period longer than 24 months.

EPD will use actual ambient monitoring and emissions inventory data as the indicators to determine whether contingency measures would be implemented. In accordance with 40 CFR Part 58, ambient monitoring data that indicates a violation of the annual $PM_{2.5}$ NAAQS will begin the process to implement these contingency measures according to the protocols identified below. The contingency plan provides for corrective responses should the NAAQS be violated or if emissions in the Atlanta maintenance area increase significantly above current levels.

Tier I. A Tier 1 trigger is activated when any one of the following conditions occurs:

- the previous calendar year's annual average $PM_{2.5}$ concentration exceeds the standard by 1.5 ug/m^3 or more;
- the annual average $PM_{2.5}$ concentration in each of the previous two consecutive calendar years exceeds the standard by 0.5 ug/m^3 or more;
- the total maintenance area SO_2 emissions in the most recent NEI exceeds the corresponding attainment-year inventory by more than 10.0 percent; and
- the total maintenance area $PM_{2.5}$ emissions in the most recent NEI exceeds the corresponding attainment-year inventory by more than 30.0 percent.

EPD will conduct an evaluation as expeditiously as practicable to determine if the trend is likely to continue. If it is determined that additional emission reductions are necessary, EPD will adopt and implement any required measures in accordance with Section 3.2.2.

The $PM_{2.5}$ trigger concentrations described above apply to the $PM_{2.5}$ federal reference monitors in the maintenance area. EPD will evaluate a Tier I condition, if it occurs, as expeditiously as practicable to determine the cause(s) of the ambient $PM_{2.5}$ or emissions inventory increase and to determine if a Tier II condition (see below) is likely to occur.

Tier II. A Tier II trigger is activated when any violation of the annual $PM_{2.5}$ NAAQS at any FRM ambient monitoring station in the Atlanta maintenance area is recorded, based on quality-assured monitoring data. In this event, EPD will conduct a comprehensive study to determine the cause(s) of the ambient $PM_{2.5}$ increase and to determine if the increase is likely to continue and will implement any required measures as expeditiously as practicable, taking into consideration the ease of implementation and the technical and economic feasibility of selected measures.

3.2.2 Schedule and Procedure for Adoption and Implementation of Contingency Measures

EPD will, in the event of 1) a Tier II trigger condition or 2) a Tier I condition in which EPD has determined that a Tier II condition is likely to occur, conduct a comprehensive study to determine whether or not contingency measures are required for the maintenance of the $PM_{2.5}$ standard. The study will attempt to determine whether the trigger condition is due to local emissions, emissions from elsewhere, or a combination of the previous. The comprehensive analysis, based on quality-assured ambient data, will examine:

- the severity of the trigger condition;
- the meteorological conditions (in the case of an ambient concentration trigger) associated with the trigger condition;
- potential contributing local emissions sources;
- potential contributing emissions resulting from regional or long-range transport;
- the geographic applicability of possible contingency measures;
- emission trends, including implementation timelines of potential control measures;
- timelines of "on-the-books" (adopted) measures that are not yet fully implemented [e.g., Georgia Rule (sss) and Rule (uuu) SO_2 controls]; and
- current and recently-identified control technologies.

The comprehensive study will be completed and submitted to EPA as expeditiously as practical but no later than nine months after the Tier I or Tier II trigger is activated. If EPD determines, through the comprehensive study, that contingency measures are required for maintenance of the standard, the appropriate corrective measures will be adopted and implemented within 18 to 24 months after the Tier I or II trigger occurs. These control measures which will continue to produce substantial reductions in fine particulate matter and its precursors in excess of what is relied upon in this maintenance plan, include the Georgia Multipollutant Rule, which is described in Section 2.3.2.1 of this maintenance plan, as well as diesel engine retrofit, replacement, and repowering programs and truck stop electrification programs which are currently being implemented by Georgia EPD.

If the study determines that additional measures are required, rules will be adopted no later than 18 months following the date on which the Tier I or Tier II trigger is activated. Selection of measures will take into consideration the ease of implementation as well as technical and economic feasibility. If it is determined that adoption and implementation of a rule will take longer than 24 months following the trigger date, EPD will submit for EPA's approval a revised schedule for the development and adoption of contingency measures.

3.2.3 Contingency Measures

If the analysis required above determines emissions from the local area are contributing to the trigger condition, EPD will evaluate those measures as specified in Section 172 of the CAA for control options as well as other available measures. If a new measure/control is already promulgated and scheduled to be implemented at the federal or state level, and that measure/control is determined to be adequate, additional local controls may be unnecessary. Under Section 175A(d), the minimum requirement for contingency measures is the implementation of all measures that were contained in the SIP before the redesignation. Currently, all such measures are in effect for the Atlanta NAA; however, an evaluation of those measures, such as RACT, can be performed to determine those measures are adequate or up-to-date. In addition to those identified in Section 3.2.2, contingency measure(s) will be selected from the following types of measures or from any other measure deemed appropriate and effective at the time the selection is made:

- Reasonably Available Control Measures (RACM) for sources of SO_2 and $PM_{2.5}$;
- Reasonably Available Control Technology (RACT) for point sources of SO_2 and $PM_{2.5}$;
- Expansion of RACM/RACT to area(s) of transport within the State;
- Mobile source measures; and
- Additional SO_2 and/or $PM_{2.5}$ reduction measures yet to be identified.

Any resulting contingency measure(s) will be based upon cost effectiveness, emission reduction potential, economic and social considerations, ease and timing of implementation, and other appropriate factors.

Adoption of additional control measures is subject to necessary administrative and legal processes. EPD will solicit input from interested and affected persons (stakeholders) in the area prior to selecting appropriate contingency measures. No contingency measure will be implemented without providing the opportunity for full public participation. This process will include issuance of notices, an opportunity for public hearing, and other measures required by Georgia law.

4.0 Motor Vehicle Emissions Budget

The transportation conformity rule (40CFR93.100 - 40CFR93.129) ensures that projects and plans funded by the Federal Highway Administration and the Federal Transit Administration conform to air quality SIPs and maintenance plans. In the case of a NAAQS maintenance plan, the rule requires a motor vehicle emissions budget (MVEB) to be established for the last year of the plan's maintenance period. The rule, at 40CFR93.124(a), describes a motor vehicle emissions budget as "...the implementation plan's estimate of future [motor vehicle] emissions." Such budgets establish caps on motor vehicle emissions; projected emissions from transportation plans and programs must be equal to or less than these caps for a positive conformity determination to be made. Transportation conformity determinations are required for non-exempt federally-funded highway and transit projects before they are funded and approved and for transportation plans and transportation improvement programs.

4.1 Pollutants

For the Atlanta area, MVEBs will be set for direct $PM_{2.5}$ and NO_x only. 40 CFR Parts 93.119(f)(7) through (10) identify the $PM_{2.5}$ pollutants which must be analyzed for transportation conformity purposes. These parts of the rule are listed below:

§119(f)(7) - $PM_{2.5}$ in $PM_{2.5}$ areas;

§119(f)(8) - Reentrained road dust in $PM_{2.5}$ areas only if the EPA [Environmental Protection Agency] Regional Administrator or the director of the State air agency has made a finding that emissions from reentrained road dust within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT [Department of Transportation];

§119(f)(9) - NO_x [nitrogen oxides] in $PM_{2.5}$ areas, unless the EPA Regional Administrator and the director of the State air agency have made a finding that emissions of NO_x from within the area are not a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT; and

§119(f)(10) - VOC, SO_2 and/or ammonia in $PM_{2.5}$ areas if the EPA Regional Administrator or the director of the State air agency has made a finding that any of such precursor emissions from within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT.

Primary, or direct, $PM_{2.5}$ emissions must be considered for all transportation conformity regional emissions analyses. For the Atlanta area, NO_x must also be considered since EPA has not approved Georgia EPD's finding that NO_x is not a significant contributor to the $PM_{2.5}$ nonattainment problem in the Atlanta area. None of the other pollutants identified (reentrained road dust, VOC, and ammonia) above have been determined by EPA or Georgia EPD to be significant contributors to PM nonattainment in the Atlanta area. SO_2 from coal combustion is significant, but levels of SO_2 emissions from mobile sources are very low and, therefore, not significant for transportation conformity purposes.

4.2 Methodology

In preparation of this Atlanta area $PM_{2.5}$ Maintenance Plan, EPD worked closely with the Georgia Department of Transportation (GDOT) and the Atlanta Regional Commission (ARC) to develop the estimates of mobile source emissions for the Atlanta nonattainment area. ARC is the metropolitan planning organization (MPO) for the Atlanta area. Mobile source inventories for 2024 were developed using the latest available planning assumptions, the most recent travel demand model, EPA's latest motor vehicle emission factor model, and vehicle population and age distributions developed from registration data obtained from R.L. Polk & Company. The methodology used to calculate the highway mobile source emissions on which the 2024 MVEBs are based is discussed below.

Emissions from motor vehicles were estimated as a sum of products of vehicle activity measures and vehicle emissions factors. Vehicle activity measures (e.g. vehicle miles traveled, or VMT) are determined from a county-specific travel demand model. Vehicle emissions factors are determined from a motor vehicle emissions model. See Appendices C-7 for more details on the development of the travel demand model and the determination of emissions factors.

The MOVES2010a motor vehicle emission model was used to calculate 2024 emission factors with all currently-known 2024 mobile source control rules in place. The MOVES model was run in Inventory Mode. The emission factors reflect all federal controls, e.g., the Federal Motor Vehicle Control Program including Tier 1 and (beginning with 2006 models) Tier 2 tailpipe standards; and the National Low Emission Vehicle program. MOVES2010a produces three sets of emission factors per run:

- rate per distance;
- rate per vehicle; and
- rate per profile.

Of these three types of emission factors, the first is multiplied by VMT, and the second two factors are multiplied by vehicle population. Note that rate-per-profile emissions (i.e., vapor venting) are not applicable to $PM_{2.5}$ modeling.

The ARC travel demand model is developed and maintained by GDOT. Inputs to the model are socioeconomic data and the highway network that consists of roadway segments (links) and intersections (nodes). Outputs include vehicle activity, number of trips, vehicle population, and other data. The use of a county-specific travel demand model for transportation conformity calculations is consistent with the transportation conformity rule at 40CFR93.122(b) and (d), which requires a network-based travel model emissions estimation methodology if the use of such procedures has been the previous practice of the MPO. The use of such a methodology has been the previous practice of ARC.

Section 93.105(b) of the Transportation Conformity Rule and Sections 106(g) and 106(h) of Georgia's transportation conformity SIP require interagency consultation for SIP development. Accordingly, a detailed listing of the procedures and planning assumptions used for the regional emissions analysis supporting development of the MVEB was presented to the Atlanta interagency consultation committee for review and was approved on August 26, 2011. The assumptions used to

develop Atlanta's conforming Long Range Transportation Plan and Transportation Improvement Program were also used to develop the network and emissions for this maintenance plan MVEB.

4.3 Motor Vehicle Emissions Budgets and Safety Margins

The projected 2024 on-road motor vehicle emissions for direct $PM_{2.5}$ and NO_x are 1642 and 35,272 tons, respectively. A budget for SO_2 is not required. On-road emissions of SO_2 are considered to be "*de-minimis*" (70FR 24283); therefore, no budget is necessary. The on-road mobile emissions, emissions budgets, and safety margins are presented in Table 4-1. A safety margin is necessary to accommodate the variabilities or worst-case scenarios that can occur due to future planning assumptions.

The worst-case daily motor vehicle emissions projection for $PM_{2.5}$ is 38.9 percent above the projected 2024 on-road emissions. In a worst-case scenario, the needed annual safety margin for the MVEB would be 639.0 tons resulting in an overall MVEB of 2,281.2 tons per year.

The worst-case daily motor vehicle emissions projection for NO_x is 26.0 percent above the projected 2024 on-road emissions. In a worst-case scenario, the needed annual safety margin for the MVEB would be 9,157.7 tons resulting in an overall MVEB of 44,429 tons per year.

Table 4-1. 2024 Motor Vehicle Emissions, Emissions Budgets, and Safety Margins

Pollutant	Projected 2024 On-Road Emissions (tons)	Safety Margin Allotted to MVEB (%)	Safety Margin Allotted to MVEB (tons)	MVEB with Safety Margin (tons)
$PM_{2.5}$	1642	39	639	2281
NO_x	35,272	26	9158	44,429

5.0 Conclusion

Section 107(d) of the CAA states that an area can be redesignated to attainment if the following conditions are met:

1. The EPA has determined that the NAAQS has been attained.
2. The applicable implementation plan has been fully approved by EPA under Section 110(k).
3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
4. The state has met all applicable requirements for the area under Section 110 and Part D.
5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area as required by CAA Section 175A.

Table 5-1. Summary of Projected SO_2 Emissions – Total of All Sectors (tons)

Source	*2008 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2024 (tons)
Point - total	413,478	172,170	51,697	52,601	53,803
Area - total	10,237	10,557	10,717	10,884	11,107
Non-road - total	1,675	1,516	1,437	1,553	1,708
Onroad	725	629	581	533	469
Total	426,115	184,873	64,433	65,572	67,088

Table 5-2. Summary of Projected NO_x Emissions – Total of All Sectors (tons)

Source	*2008 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2024 (tons)
Point - total	80,785	45,489	27,867	28,535	29,423
Nonpoint - total	21,193	23,531	24,698	25,916	27,537
Non-road - total	40,599	34,086	30,835	29,747	28,298
Onroad	128,955	93,806	76,258	58,675	35,272
Onroad Safety Margin					9,158
Total	271,531	196,912	159,659	142,873	129,688

Table 5-3. Summary of Projected $PM_{2.5}$ Emissions – Total of All Sectors (tons)

Source	*2008 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2024 (tons)
Point - total	5,637	4,541	3,993	4,120	4,288
Nonpoint - total	35,686	40,052	42,232	44,072	46,520
Non-road - total	2,827	2,360	2,127	1,967	1,755
Onroad	4,662	3,530	2,963	2,397	1,642
Onroad Safety Margin					639
Total	48,811	50,482	51,316	52,556	54,844

The supporting documentation to show that the above conditions have been met for the Atlanta area is contained in this document. Based on the 2008-2010 monitored design value for the Atlanta nonattainment area, EPA has published in the Federal Register its final rule that the nonattainment area has attained the 1997 annual average $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). The maintenance demonstration in this document shows that, based on comparison of projected emissions to attainment year emissions, emissions are expected to stay at or below levels commensurate with attaining air quality through the year 2024 as illustrated by Tables 5-1, 5-2 and 5-3 above. Analysis was presented to demonstrate that the standard will be maintained despite a small, projected increase in direct $PM_{2.5}$ emissions. This document also contains provisions for contingency measures should emissions levels or ambient concentrations rise unexpectedly. EPA's concurrence that the improvement in the Atlanta area's air quality is due to permanent and enforceable reductions in emissions and EPA's approval of this document will satisfy Items 3 and 5 above. Therefore, Georgia EPD requests that the Atlanta area be redesignated from nonattainment to attainment with respect to the 1997 annual NAAQS for fine particulate matter. In addition, 2024 MVEBs have been presented for onroad mobile emissions of direct $PM_{2.5}$ and NO_x. These emissions budgets are required by EPA's transportation conformity rule as tools for ensuring conformance of highway and transit plans with air quality SIPs and maintenance plans.

6.0 References

State of Georgia, Rules for Air Quality Control, Chapter 391-3-1, Effective September 13, 2011.

US Energy Information Administration, Annual Energy Outlook 2010, April 2010.

USEPA, Air Quality Modeling Final [Cross-state Air Pollution] Rule Technical Support Document, June 2011, Docket ID No. EPA-HQ-OAR-2009-0491-4140.

USEPA, "Approval, and Promulgation of Air Quality Implementation Plans; Indiana; Redesignation of the Evansville Area to Attainment of the Fine Particulate Matter Standard'; proposed rule, 76 FR 29695.

USEPA, "Clean Data Policy for the Fine Particle National Ambient Air Quality Standards," Memorandum from Stephen Page, December 14, 2004.

USEPA, "Determination of Attaining Data for the 1997 Annual Fine Particulate Standard; Atlanta, Georgia, Final Rule"; 76 FR 76620.

USEPA, "Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals" [a.k.a. "Cross-State Air Pollution Rule"]; final rule, 76 FR 48208.

USEPA, National Emissions Inventory: Inventory Years 2005, and 2008.

USEPA, "Procedures for Processing Requests to Redesignate Areas to Attainment," Memorandum from John Calcagni, September 14, 1992.