Georgia's Redesignation Request and Maintenance Plan for the Chattanooga Nonattainment Area for the 1997 $PM_{2.5}$ NAAQS For Catoosa and Walker Counties

August 31, 2012

Prepared by:

Georgia Department of Natural Resources

Environmental Protection Division

Air Protection Branch

Executive Summary

This document contains Georgia's request under the Clean Air Act Amendments (CAA) of 1990 that the Georgia portion of the Chattanooga 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 Catoosa and Walker counties. The Georgia Environmental Protection Division has developed its own separate maintenance plan for the Georgia portion of the Chattanooga $PM_{2.5}$ nonattainment area.

This request is based on three years, 2007-2009, 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 Georgia Portion of Chattanooga Maintenance Plan with projections demonstrating maintenance of the standard through the year 2025.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST of APPENDICES

List of Acronyms

Acronym	Meaning	Acronym	Meaning
AEO	Annual Energy Outlook	FGD	Flue Gas Desulfurization
AERR	Annual Emissions Reporting Requirements	FR	Federal Register
AIRS	Aerometric Information Retrieval System	FRM	Federal Reference Method
AQS	Air Quality Subsystem	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
ERTAC	Eastern Regional Technical Advisory Committee		

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 Georgia portion of the Chattanooga 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: Chattanooga (which also includes parts of Alabama and Tennessee), Floyd County, Atlanta, and Macon. Figure 1-1 shows their locations. The Georgia portion of the Chattanooga nonattainment area is located in the northwest portion of the state and consists of Catoosa and Walker counties.

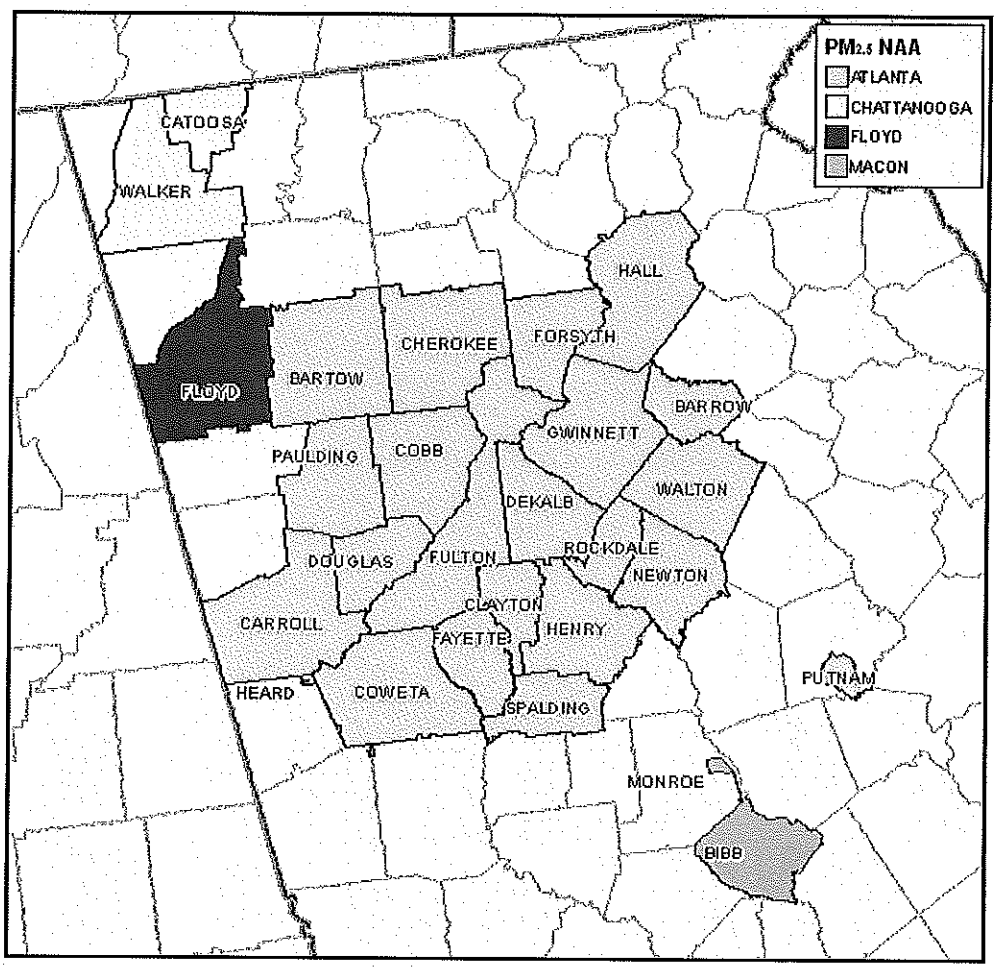

Figure 1-1. $PM_{2.5}$ Nonattainment Areas in Georgia

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

EPA made initial designations of nonattainment areas, including the Chattanooga nonattainment area, for the 1997 annual $PM_{2.5}$ NAAQS on January 5, 2005 (70FR944), and amended the designations on April 5, 2005 (70FR19844). The observed $PM_{2.5}$ design value at three of the four nonattainment area monitors violated the annual standard, as shown in Table 1-1 below. Three of the monitors are located in Hamilton County, Tennessee, and one is located in Walker County, Georgia.

Table 1-1. $PM_{2.5}$ Design Value for Chattanooga Nonattainment Area

Site Name	Monitor ID	$PM_{2.5}$ Design Value 2001-2003 ($\mu g/m^3$)
Siskin Drive/UTC, Tennessee	470654002	15.2
Maxwell Road/EastRidge, Tennessee	470650031	16.1
Soddy-Daisy High School, Tennessee	470651011	14.1
Rossville – Maple St., Georgia	132950002	15.5

The State of Georgia prepared and submitted a $PM_{2.5}$ attainment demonstration plan for the Georgia portions of the Chattanooga nonattainment area to EPA Region 4 on October 27, 2009 (cover date is October 16). The plan was based on modeling of the effects of existing and planned control measures on air quality in the Chattanooga area and demonstrated attainment of the standard by April 5, 2010.

Since EPA has determined that the area has met the clean data requirements (76FR 31239) and attained the standard prior to the attainment date (76FR 55774) (see Section 2), the SIP requirements that the October 27, 2009, 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 51.1004(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 Georgia portion of the Chattanooga 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 Georgia portion of the Chattanooga $PM_{2.5}$ 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 2007 through 2009;
- 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 Chattanooga area design value, based on data from 2007 through 2009, is 12.7 $\mu g/m^3$ (Monitor ID 470654002), which demonstrates attainment of the standard. The monitoring network and ambient $PM_{2.5}$ data are presented below.

2.1.1 Monitoring Network

One $PM_{2.5}$ Federal Reference Method (FRM) monitor and one $PM_{2.5}$ speciation monitor are located at the Rossville-Maple Street site (13-295-0002) in the Georgia portion of the Chattanooga NAA. The $PM_{2.5}$ FRM monitor was installed in accordance with 40 CFR 58 and has been collecting data since January 1, 2000. Its sampling schedule was every six days until January 3, 2007, when it started sampling every three days. The $PM_{2.5}$ speciation monitor has been collecting data since March 23, 2005. The sampling schedule of the $PM_{2.5}$ speciation monitor has been and remains every six days. Due to construction of the Rossville Health Department sampling location, these monitors were moved from the Rossville Health Department site to their current location on Maple Street. The samplers were temporarily shut down on June 11, 2007, and restarted on November 14, 2007. During this time, EPD actively searched and found a location to set up the monitoring equipment within the required distance to keep the same AQS identification.

The locations of the monitoring sites are shown in Figure 2-1. $PM_{2.5}$ data collection dates at the Rossville-Maple Street site are presented in Table 2-1.

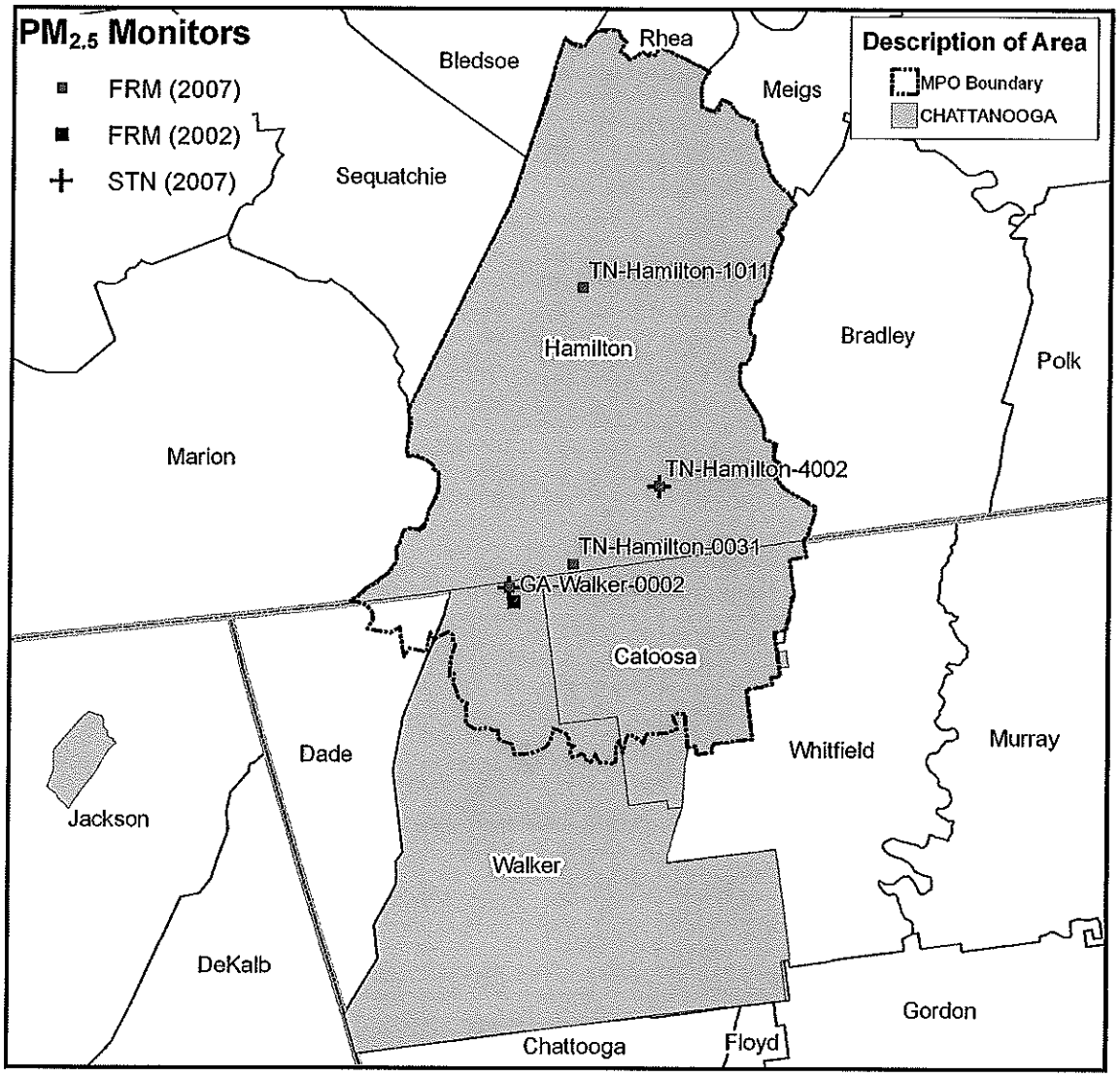

Figure 2-1. Locations of Chattanooga Nonattainment Area $PM_{2.5}$ Sampling Sites

Table 2-1. Rossville-Maple St. $PM_{2.5}$ Data Collection Site

Site Name	AQS* Site ID	Start Date – FRM Data Collection	End Date - FRM Data Collection	Start Date – Speciation Data Collection	End Date - Speciation Data Collection
Rossville	13-295-0002	Jan. 1, 2000	June 11, 2007	March 23, 2005	June 11, 2007
Maple Street	13-295-0002	Nov 14, 2007		Nov 14, 2007	

* 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 Chattanooga nonattainment area. The 2007–2009 three-year design value is 12.7 $\mu g/m^3$, which is 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 2008-2010 three-year design value (Monitor ID 470654002) is 11.6 $\mu g/m^3$. This provides continued evidence that the area is meeting the standard. To date the quality-assured annual average for 2011 is not available.

No data were collected from June 12–November 13, 2007 at the Rossville-Maple Street site (13-295-0002) because a new roof was installed in June of 2007. Because of the shutdown of the monitor, the Rossville site did not meet data completeness requirements for 2007. Georgia developed a weight-of-evidence approach for an alternative method of data substitution. The analysis used data from Siskin Drive (47-065-4002) and Tombras Avenue (47-065-0031) sites to determine the attainment status of the Rossville site. GA EPD's "Analysis of Rossville $PM_{2.5}$ Data" can be found in the EPA docket at http://www.regulations.gov (docket ID Number EPA-R04-OAR-2011-0084-0002). The EPA Office of Air Quality Planning and Standards (OAQPS) ran a regression analysis in order to confirm Georgia's approach. OAQPS found that site substitution would be appropriate for data substitution.

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

Year	Monitor 13-295-0002 ($\mu g/m^3$)	Monitor 47-065-0031 ($\mu g/m^3$)	Monitor 47-065-1011 ($\mu g/m^3$)	Monitor 47-065-4002 ($\mu g/m^3$)
2003	15.9	16.5	14.3	14.9
2004	14.9	15.6	13.3	14.5
2005	16.4	16.1	13.8	15.5
2006	14.4	14.3	13.1	15.0
2007	13.7*	14.9	14.2	15.0
2008	12.5	12.3	11.4	12.7
2009	10.7	10.5	9.5	10.5
2010	8.9	12.0	13.3	11.7
2007-2009	12.3*	12.6	11.7	12.7
2008-2010	10.7	11.6	11.4	11.6

*Values subject to data substitution (76 FR 15895)

2.1.3 Clean Data Determination

On May 31, 2011, EPA promulgated its determination (76 FR 31239) that the Chattanooga 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 2007-2009 period which showed a design value of 12.7 $\mu g/m^3$. 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 June 30, 2011.

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 Georgia portion of the Chattanooga nonattainment area. The plan was submitted for approval to EPA Region 4 on October 27, 2009. As discussed in Section 1.1 of this redesignation request and maintenance plan, the attainment demonstration, RFP, associated RACM, and contingency requirements that the October 27, 2009, 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 2007 through 2009 is due to permanent and enforceable reductions, unless otherwise stated, 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 2002-2006 speciated $PM_{2.5}$ measurements for a standalone analysis conducted at the Hamilton County STN monitor (47-065-4002) (Figure 2-2). 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.

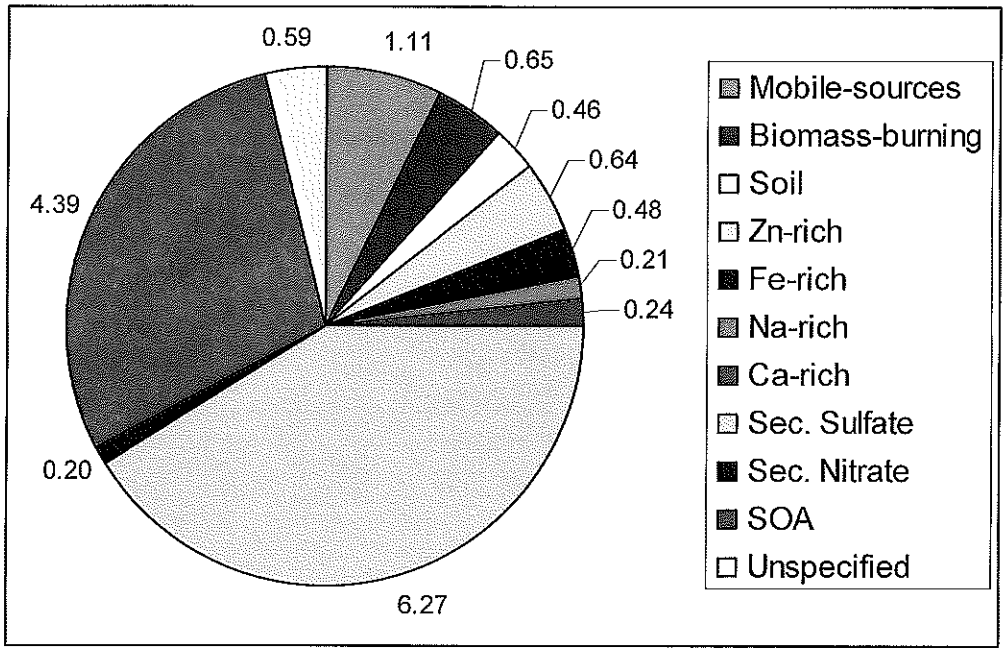

Figure 2-2. Average factor contributions to $PM_{2.5}$ ($\mu g/m^3$) for 2002-06 at the Chattanooga STN site using PMF

These source-apportionment results are useful for a preliminary assessment of control strategies. Given the large contributions to $PM_{2.5}$ from the secondary-sulfate factor, it is evident that controlling SO_2 emissions (mainly from coal-burning EGUs) would reduce $PM_{2.5}$ levels in the Chattanooga MSA. Controlling emissions of SOA precursors would also be useful. Unfortunately, these are not yet well understood, and limited available knowledge suggests biogenic sources as the primary SOA precursors. Reducing primary $PM_{2.5}$ may be best achieved by emission reduction measures for mobile-source emissions and biomass burning. Contributions from all other source-categories were small in general.

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 and biomass burning. 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 (rule (sss))
- SO_2 limits on EGUs (rule (uuu))
- Smoke Management Plan

Table 2-3 shows the timetable of implementation of these measures as well as the species controlled by each. 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 meteorological influenced phenomenon. Detailed discussions of the measures are presented in the following subsections.

Table 2-3. Timetable of State Measure Implementation

Measure	Species controlled	2001	'02	'03	'04	'05	'06	'07	'08	'09	'10
$PM_{2.5}$ ann. avg. ($\mu g/m^3$), (Monitor 47-065-4002)		16.1	14.7	14.9	14.5	15.5	15.0	15.0	12.7	10.5	11.7
Rule (sss)	SO_2, NO_x								*		
Smoke Management Plan	PM, NO_x										
Rule (uuu)	SO_2										

* 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 state-wide 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 has been well demonstrated that ambient secondary sulfate in a given location can be significantly affected by SO_2 emissions from distant sources. Even though the Georgia portion of the Chattanooga area has no EGU facilities, the secondary sulfate in the Chattanooga nonattainment area is affected by SO_2 emissions from coal-fired EGUs in North Georgia and the Alabama portion of the Chattanooga NAA. 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 Hammond is located approximately 25 miles south of the nonattainment area. Plant Bowen, which is located approximately 35 miles south-southeast of the nonattainment area, 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 Wansley is located approximately 80 miles south of the Chattanooga 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 state-wide energy production from coal-fired facilities.

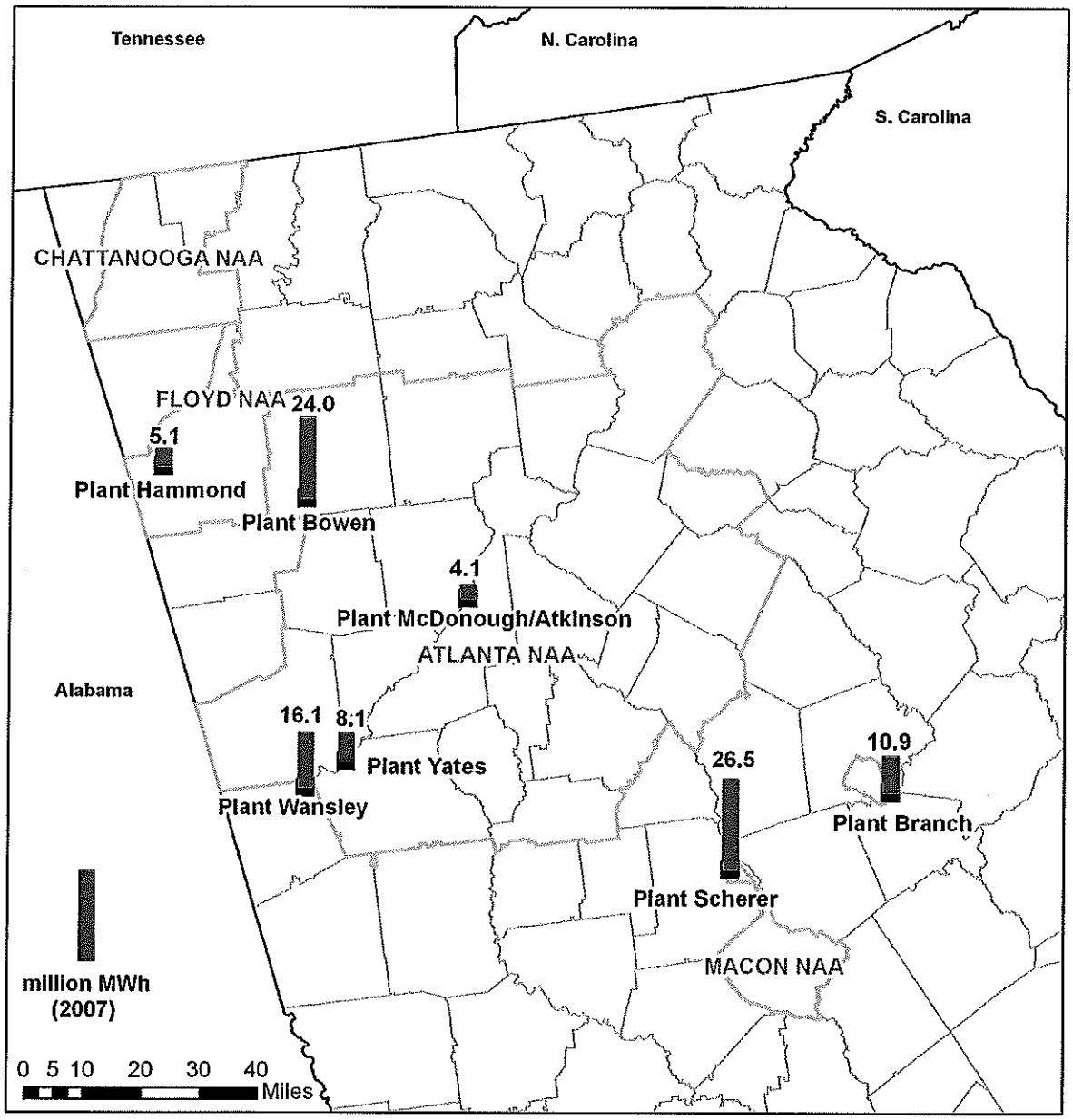

Figure 2-3. Locations and 2007 Energy Production of Coal-fired EGU Facilities in North Georgia

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.

Rule (sss) requires SCR controls to be operated year-round, starting at six EGUs in 2008 and 2009 (Bowen Units 2, 3, and 4; Wansley Units 1 and 2; and Hammond Unit 4). However, these NO_x controls were already in place and operating during the ozone season by the end of 2003. The Title V permit of each of the above facilities has been amended to permit operation of the FGD and SCR controls.

Table 2-4 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.

For the seven facilities, SO_2 emissions were reduced by 60.2% and generation was down by only 4.7%. These statistics provide clear evidence that the reduction in $PM_{2.5}$ concentration is due to permanent and enforceable controls rather than to reduced production.

Table 2-4. 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	9.8
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**
Ambient $PM_{2.5}$, Monitor 47-065-4002	**annual average (ug/m^3)**	14.9	14.5	15.5	15.0	15.0	12.7	10.5	11.7

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

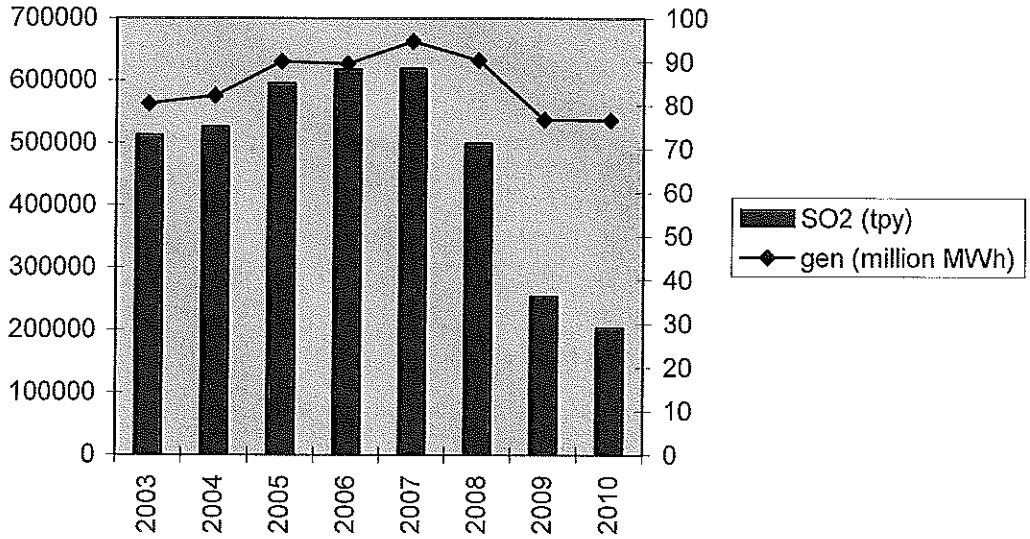

Figure 2-4. SO_2 Emissions and Generation from North Georgia Coal-fired EGU Facilities, 2003 - 2010

2.3.2.2 Smoke Management Plan

Forestry and agriculture, two of 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 (GFC) 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 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 Chattanooga 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 2-5 shows the timetable of implementation of these measures as well as the species controlled by each. The 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 2-5. Timetable of Federal Measure Implementation

	Species controlled	**2001**	**'02**	**'03**	**'04**	**'05**	**'06**	**'07**	**'08**	**'09**	**'10**
$PM_{2.5}$ ann. avg. ($\mu g/m^3$) Monitor 47-065-4002		16.1	14.7	14.9	14.5	15.5	15.0	15.0	12.7	10.5	11.7
Clean Air Interstate Rule (CAIR)	NO_x, SO_2*										
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										

* SO_2 controls required beginning 2010

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 2007-to-2009 clean data period for the Chattanooga nonattainment area. However, before that date arrived, the D.C. Circuit Court of Appeals stayed the implementation of the rule. Then, on August 21, 2012, the D.C. Circuit Court of Appeals issued the following order to EPA: *"We vacate the Transport Rule [aka CSAPR] and the Transport Rule FIPs and remand this proceeding to EPA. EPA must continue administering CAIR pending the promulgation of a valid replacement."* At this point in time, EPA has not announced their intended response to the court's ruling. So, it is unknown whether or not EPA will appeal the decision (either to a full panel of the D.C. Circuit or the U.S. Supreme Court), if it will conduct rulemaking in response to the court's decision, or take some other path forward. Regardless, 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 US 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 2-6 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 2-5.

Table 2-6. 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 2007 - 2009 are due to SO_2 emissions reductions achieved both within and outside Georgia. The majority of upwind reductions result from 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 August 21, 2012, the D.C. Circuit Court of Appeals issued the following order to EPA: "We vacate the Transport Rule [aka CSAPR] and the Transport Rule FIPs and remand this proceeding to EPA. EPA must continue administering CAIR pending the promulgation of a valid replacement."* At this point in time, EPA has not announced their intended response to the court's ruling. So, it is unknown whether or not EPA will appeal the decision (either to a full panel of the D.C. Circuit or the U.S. Supreme Court), if it will conduct rulemaking in response to the court's decision, or take some other path forward. Regardless, emissions of SO_2 from upwind states have declined significantly and are expected to continue to decrease in the future.)

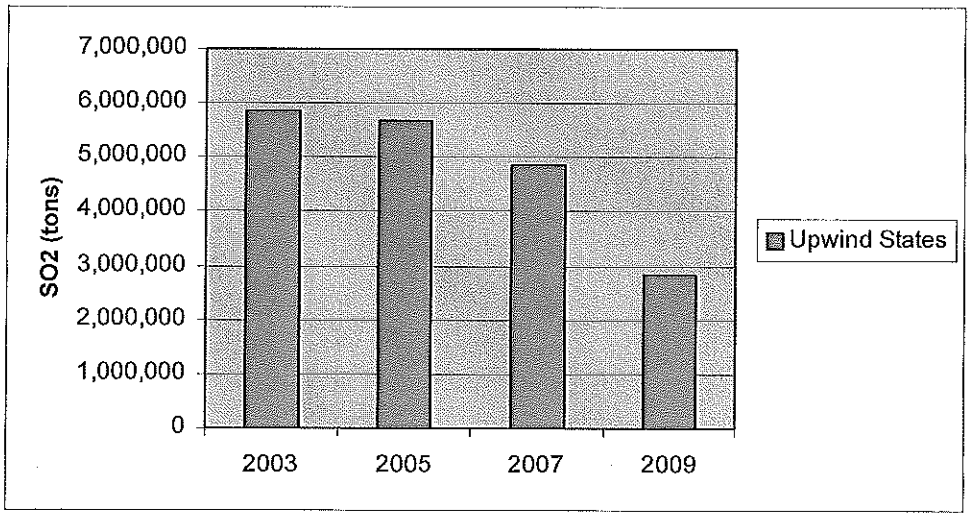

Figure 2-5. Trend of Aggregated Annual SO_2 Emissions in States With Downwind Contributions to Georgia $PM_{2.5}$ Exceeding 0.15 µg/m^3

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 Chattanooga area was designated as nonattainment for the 1997 annual fine PM standard in April of 2005. The area is not now and has not previously been designated nonattainment for any other NAAQS.

Georgia EPD submitted a $PM_{2.5}$ nonattainment plan for the Georgia portion of the Chattanooga nonattainment area per Title I Part D. With the determination that the Chattanooga 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 requirements 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 Chattanooga 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,[3] 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 2025.

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 2007 as the year for the attainment year emissions inventory. 2007 is one of the three years (2007 – 2009) on which the Chattanooga area's clean data determination is based. The pollutants inventoried and addressed in this maintenance plan are direct $PM_{2.5}$, SO_2, and NO_x. The following emissions sectors are included in the inventory:

- Point sources (EGU and non-EGU).
- Nonpoint sources (including fire),

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

- Onroad mobile sources, and
- Nonroad mobile sources (including marine vessels, aircraft, and rail).

The 2007 inventory, with the exception of on-road mobile emissions, was prepared for Georgia by the contractors for the Southeastern Modeling, Analysis, and Planning (SEMAP) project. SEMAP is funded by the same ten states that participated in the Visibility Improvement – State and Tribal Association of the Southeast (VISTAS) project. Under the SEMAP project, emissions estimates are reported by county and source classification code (SCC). The SEMAP emissions inventories were developed using data from a number of sources, including state and local agencies and EPA's National Emissions Inventory (NEI). Georgia Department of Transportation developed the 2007 inventory of on-road mobile emissions.

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. 2007 Emissions Inventory Sources

Emissions Source Sector	Inventory Source	Version / Year Generated	Basis
Point – non-EGU	SEMAP	Version 1.10, 2012	EPA's NEI
Nonpoint	SEMAP	Revised Final Report, 2012	EPA's NEI
Onroad Mobile	GDOT	2012	Georgia DOT (travel demand model and Highway Performance Monitoring System (HPMS)) and MOVES2010a
Nonroad Mobile	SEMAP	Revised Final Report, 2012	NMIM2008, 2007 NMIM County Database, 2008 NEI, ERTAC

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.

There are no EGU facilities in Catoosa or Walker counties. There is only one non-EGU point source, and it is in Walker County. The facility is Crystal Springs Print Works, Inc. The 2007 emissions of SO_2, NO_x, and $PM_{2.5}$ from EGU and non-EGU facilities are presented in Table 3-2.

Table 3-2. Point Source Emissions for 2007 (tons, annual)

Pollutant	EGU	Non-EGU	Total Point
SO_2	0	280	280
NO_x	0	48	48
$PM_{2.5}$	0	0	0

The 2007 point source inventory for the Georgia portion of the Chattanooga $PM_{2.5}$ nonattainment area is based on the National Emissions Inventory (NEI) reports for reporting years 2005 and 2008. 2007 emissions were estimated based on a linear interpolation between facility level 2005 and 2008 emissions on a pollutant-by-pollutant basis to calculate facility-level 2007 emissions. See Appendices C and C-1 for more details on the development of the 2007 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 from nonpoint sources in 2007 were obtained from the SEMAP final nonpoint source inventory Version 1.1. A default 2007 nonpoint source inventory was created that includes all of the source categories covered by the 2008 nonpoint source NEI.

For all source categories except industrial and commercial/institutional (ICI) fuel combustion, emissions data from the 2008 nonpoint source NEI were directly incorporated when the NEI emissions were based on 2007 emissions activity data. The NEI emissions estimates were recalculated to reflect 2007 activity levels when the NEI emissions reflected 2006 or 2008 activity levels. Emissions associated with activity reflected in the point source inventory were removed from the nonpoint inventory.

For ICI fuel combustion, the 2008 nonpoint source NEI developed emissions activity estimates rather than emission estimates. Because of the potential importance of these source categories and the availability of methodological improvements, Pechan utilized an emissions estimation method for ICI fuel combustion that incorporates a few refinements to the NEI method. These emissions

were supplemented with carry-forward categories from Georgia's 2005 CERR submission grown using EPA's Economic Growth Analysis System (EGAS). For more information regarding the SEMAP nonpoint inventory, please refer to Appendices C and C-2.

The 2007 nonpoint source emissions for Catoosa and Walker counties are presented in Table 3-3. The largest contributor to SO_2 emissions was residual-oil-fired industrial boilers. The largest contributor to NO_x emissions was industrial wood-fired boilers. The largest contributor to $PM_{2.5}$ emissions was road dust from unpaved roads.

Emissions from fires in 2007 were obtained from the SEMAP final "actual" fire emissions inventory and are shown in Table 3-3. This inventory was developed using 2007 burned area data submitted by Georgia, as well as updated fuel consumption and emissions factors.

Table 3-3. Nonpoint Source Emissions for 2007 (tons, annual)

Pollutant	Nonpoint (excluding fire)	Fire	Total Nonpoint
SO_2	68	9	77
NO_x	303	55	359
$PM_{2.5}$	1,354	195	1,548

The 2007 level of $PM_{2.5}$ emissions from nonpoint sources, excluding fire, was 1,354 tons. This quantity accounted for over 75 percent of total $PM_{2.5}$ emissions in Catoosa and Walker counties. The top three nonpoint source classifications for $PM_{2.5}$ emissions were dust from unpaved roads, industrial wood-fired boilers, and residential open burning of household waste (see Table 3-4).

Table 3-4. Largest Nonpoint $PM_{2.5}$ Emissions by Source Classification

SCC	Description	2007 $PM_{2.5}$ (tons)
2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	665
2102008000	Stationary Fuel Comb /Industrial /Wood /Total: All Boiler Types	165
2610030000	Open Burning /Residential /Household Waste	140

3.1.1.3 Onroad Mobile Sources

U.S. EPA's MOVES2010a mobile source emissions model was run in rate look-up mode, and datasets were interpolated between 2002 and 2009 to generate 2007 on-road mobile source emissions of SO_2, NO_x, and $PM_{2.5}$ since 2007 model runs were not available. The 2007 onroad mobile source emissions for Catoosa and Walker counties are presented in Table 3-5.

Table 3-5. Onroad Mobile Source Emissions for 2007 (tons, annual)

Pollutant	Onroad Emissions
SO_2	20
NO_x	4442
$PM_{2.5}$	134

Best available local data 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 were used.

The Chattanooga Metropolitan Planning Area (MPO) travel model includes all of Catoosa County and the portion of Walker County within the MPO planning area. The Travel Demand Model is used to estimate VMT and congested flow speeds for the subregions included in the travel model. Off-model, Highway Performance Monitoring System (HPMS) based modeling techniques were used to calculate emissions for the "donut" portion of Walker County that falls outside the MPO planning and travel modeling area.

Age distribution was based on MOVES national defaults. Source type population inputs were based on 2002 vehicle registration data with MOVES national default vehicle type ratios. Meteorological information was obtained from EPA's National Mobile Inventory Model for 2007. For a detailed discussion on how the on-road mobile emission inventory was developed, see Appendix C-3.

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. There are no commercial marine vessel emissions sources in Catoosa and Walker counties. 2007 nonroad mobile emissions are presented in Table 3-6.

Emissions from NONROAD model source categories in 2007 were obtained from the SEMAP final nonroad mobile sources emissions inventory. These emissions were calculated using EPA's latest National Mobile Inventory Model, NMIM2008, which incorporates EPA's latest NONROAD model (NONROAD2008) and reflects all of EPA's final nonroad standards to date. The county/monthly gasoline profile assignments in the County/Year/Month table and the gasoline fuel profiles in the Gasoline table of the 2007 NMIM county-level database (NCD) were updated with data provided by

the state of Georgia. For more information regarding the SEMAP nonroad inventory, please refer to Appendices C and C-2. 2007 Emissions from aircraft and locomotives were obtained from the SEMAP final nonroad mobile source emissions inventory. For more information regarding the SEMAP marine, aircraft, and locomotives inventory, please refer to Appendices C and C-4.

Table 3-6. Nonroad Mobile Source Emissions for 2007 (tons, annual)

Pollutant (tons)	Nonroad - except air and rail	Aircraft	Locomotive	Total Nonroad
SO_2	26	0.2	2	27
NO_x	450	1	182	633
$PM_{2.5}$	43	3	5	51

3.1.1.5 Summary of 2007 Emissions Inventory

The total 2007 Catoosa and Walker County emissions of SO_2, NO_x, and $PM_{2.5}$ are presented for each source sector in Table 3-7. The majority of SO_2 emissions, by far, are from point sources. The majority of NO_x emissions are from onroad mobile sources. The majority of $PM_{2.5}$ emissions are from nonpoint sources.

Table 3-7. Attainment-year (2007) Emissions Inventory (tons, annual)

Pollutant (tons)	Point Total	Point EGU	Point Non-EGU	Nonpoint	Onroad Mobile	Nonroad Mobile	Total
SO_2	280	0	280	77	20	27	404
NO_x	48	0	48	359	4,442	633	5,482
$PM_{2.5}$	0	0	0	1,548	134	51	1,733

3.1.2 Projected Emissions Inventories

As discussed previously, Georgia EPD is providing a demonstration of maintenance through the year 2025 (the maintenance year). Emissions projections to support maintenance through 2025 have been prepared for the years 2017 and 2025. 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 2007 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 2025 (out year). The bases used to determine these factors are summarized in Table 3-8.

Table 3-8. Bases of Control and Growth Factors for 2017 and 2025 Inventories

Source Category	Control Basis	Growth Factor Basis
Point – non-EGU	Regulatory review - no additional controls defined at this time	EGAS growth factors by SCC and county for 2017 and 2025.
Nonpoint	Regulatory review - no additional controls defined at this time	EGAS growth factors by SCC for 2017 and 2025.
Nonpoint – fire	No additional controls anticipated	No growth anticipated
Onroad Mobile	MOVES rate look-up mode ($PM_{2.5}$, NO_x, SO_2) for 2025. All known Federal controls.	MOVES rate look-up mode ($PM_{2.5}$, NO_x, SO_2) for 2025. 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 2025	SEMAP (Pechan) growth factors by SCC for 2017 and 2025

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 (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

There are no EGU facilities in Catoosa or Walker counties. Projected non-EGU point source emissions are shown in Table 3-9 (county totals). The emissions for 2017 and 2025 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-6 contains the SCC-specific growth factors for Catoosa and Walker counties. The projections show small increases in emissions for SO_2 and NO_x. No additional future controls can be defined for non-EGU point sources at this time. Emissions levels for 2014 and 2020 were calculated by linear interpolation.

Table 3-9. Projected Point Source Emissions (tons)

Pollutant	*2007 (attainment)*	2014	2017	2020	2025
EGU					
SO_2	0	0	0	0	0
NO_x	0	0	0	0	0
$PM_{2.5}$	0	0	0	0	0
Non-EGU					
SO_2	280	285	287	290	295
NO_x	48	49	49	50	52
$PM_{2.5}$	0	0	0	0	0
Total Point					
SO_2	280	285	287	290	295
NO_x	48	49	49	50	52
$PM_{2.5}$	0	0	0	0	0

3.1.2.3 Nonpoint Sources

Nonpoint source emissions, excluding fire, in future years 2017 and 2025 were estimated using SCC- and county-specific growth factors generated with EGAS 5.0. Appendix C-6 contains the SCC-specific growth factors for Catoosa and Walker counties. No additional future controls can be defined for these sources at this time.

Projections of nonpoint source emissions are presented in Table 3-10. Emissions from fire in future years 2017 and 2025 were assumed to be the same as 2007 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 3-10. Projected Nonpoint Source Emissions (tons)

Pollutant	*2007 (attainment)*	2014	2017	2020	2025
Nonpoint (excluding fire)					
SO_2	68	72	74	75	78
NO_x	303	342	358	374	401
$PM_{2.5}$	1,354	1,535	1,612	1,684	1,804
Fire					
SO_2	9	9	9	9	9
NO_x	55	55	55	55	55
$PM_{2.5}$	195	195	195	195	195
Total Nonpoint					
SO_2	77	81	82	84	87
NO_x	359	397	414	430	456
$PM_{2.5}$	1,548	1,729	1,807	1,878	1,998

The top three nonpoint source classifications for 2025 $PM_{2.5}$ emissions are dust from unpaved roads, industrial wood-fired boilers, and residential open burning of household waste (see Table 3-11). Projected $PM_{2.5}$ emissions from these three source classifications make up over 60 percent of total projected $PM_{2.5}$ emissions.

Table 3-11. Largest Nonpoint $PM_{2.5}$ Emissions by Source Classification, Year 2025

SCC	Description	2025 $PM_{2.5}$ (tons)
2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	885
2102008000	Stationary Fuel Comb /Industrial /Wood /Total: All Boiler Types	223
2610030000	Open Burning /Residential /Household Waste	186

3.1.2.4 Onroad Mobile Sources

U.S. EPA's MOVES2010a mobile source emissions model was run in rate look-up mode to generate 2025 onroad mobile source emissions of SO_2, NO_x, and $PM_{2.5}$. Intermediate year emissions were generated by interpolating between 2007 and 2025.

VMT and congested flow speeds were estimated by the travel demand model for areas within the MPO. VMT estimates derived from the travel demand model were adjusted based on Federal Highway Administration HPMS traffic count data from Georgia. Outside the MPO, VMT was estimated using GA HPMS traffic count data. The vehicle age distribution was based on MOVES national defaults. Source type population inputs were based on 2002 vehicle registration data with MOVES national default vehicle type ratios. Temperature and humidity inputs were assumed to be the same as year 2007.

The projected onroad mobile source emissions levels are presented in Table 3-12. Onroad emissions of all three pollutants trend downward 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 Appendix C-3.

Table 3-12. Projected Onroad Mobile Source Emissions (tons)

Pollutant (tons)	*2007 (attainment)*	2014	2017	2020	2025
SO_2	20	17	15	14	11
NO_x	4,442	3,112	2,542	1,972	1,022
$PM_{2.5}$	134	96	80	63	36

3.1.2.5 Nonroad Mobile Sources

Projections of nonroad emissions in 2017 and 2025, excluding air and rail sources, were calculated using NMIM2008 with the same meteorological inputs as for 2007. 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 2007 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 3-13. Total emissions of all three pollutants trend downward during the maintenance period. As with onroad sources, the downward trend in SO_2 is of less importance since nonroad sources emit very little SO_2. For a

detailed discussion on how the nonroad mobile emissions projections were developed, see Appendix C.

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

Pollutant (tons)	*2007 (attainment)*	2014	2017	2020	2025
*Nonroad**					
SO_2	26	8	0.6	0.6	0.6
NO_x	450	296	230	204	160
$PM_{2.5}$	43	31	26	23	17
Aircraft					
SO_2	0.2	0.2	0.2	0.2	0.2
NO_x	1	1	1	1	1
$PM_{2.5}$	3	3	3	3	3
Locomotive					
SO_2	1.6	0.5	0.1	0.1	0.1
NO_x	182	153	141	132	116
$PM_{2.5}$	5	4	3	3	2
Tot. Nonroad					
SO_2	27	8.8	0.8	0.8	0.9
NO_x	633	450	372	336	277
$PM_{2.5}$	51	38	32	28	22

* excluding aircraft and locomotive emissions

3.1.3 Emissions Projections Summary and Demonstration of Maintenance of Attainment

The consolidated emissions projections for all Catoosa and Walker County sources are presented in Table 3-14. Emissions of SO_2 and NO_x drop from 2007 to 2025. 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 2.5 percent and 67 percent, respectively, over the course of the maintenance period.

Emissions of $PM_{2.5}$ rise from 2007 through 2025. This is a reflection of an increase in nonpoint source emissions (primarily road dust and industrial wood boilers) which is partially offset by reductions in the onroad and nonroad sectors. The overall rise in $PM_{2.5}$ is 18.6 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 3-14. Projected Emissions – Total of All Sectors (tons)

Pollutant (tons)	*2007 (attainment)*	2014	2017	2020	2025	% change, 2007 - 2025
SO_2	404	391	385	389	394	-2.5
NO_x	5,482	4,009	3,377	2,788	1,806	-67.1
$PM_{2.5}$	1,733	1,863	1,918	1,970	2,056	+18.6

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 Chattanooga monitor (site 47-065-4002). The 3-year average of this data suggests that ambient $PM_{2.5}$ in Chattanooga consists of approximately 48.1 percent sulfate, 2.4 percent nitrate, 40.6 percent organic particulate (which consists of directly-emitted primary organic matter and atmospherically formed secondary organic aerosol), 5.0 percent miscellaneous inorganic particulate (sometimes labeled "crustal particles"), and 3.9 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 45.6 percent (sum of 40.6 and 5.0) 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 18.6 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 Chattanooga analysis, the baseline concentration is conservatively assumed to be 15.0 $\mu g/m^3$. Direct $PM_{2.5}$ is estimated to contribute 45.6 percent, or 6.84 $\mu g/m^3$, 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 18.6 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 1.27 $\mu g/m^3$.

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 Chattanooga, 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 Chattanooga concentrations with the final CSAPR in place would be 3.7 $\mu g/m^3$ below the standard (2014 Remedy Average case*). In addition, the emissions reductions that have already occurred have brought measured Chattanooga concentrations to 11.6 $\mu g/m^3$ (as shown in Table 2-2). Therefore, the 1.27 $\mu g/m^3$ 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 2025 emissions compared to the attainment year (2007) emissions. The surpluses are shown in Table 3-15 for each pollutant. A positive surplus reflects an emissions decrease from the attainment year to 2025. 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 safely margin (see Section 4).

Table 3-15. Emissions Decrease

Pollutant	Surplus Emissions* 2007 to 2025 (tons)
SO_2	10
NO_x **	3,676
$PM_{2.5}$ **	-323

* Surplus = (2007 emissions level) – (2025 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 monitor in Georgia's portion of the Chattanooga area are described in Section 2.1 of this plan. During the maintenance period EPD will continue to operate a federal reference monitor in Walker County 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 three-year cycle. The inventory will be updated and maintained on a three-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 Georgia portion of the Chattanooga $PM_{2.5}$ 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 Georgia portion of the Chattanooga 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 30.0 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 Chattanooga 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. Since Catoosa and Walker counties may be influenced by emissions from outside the maintenance area, 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 Chattanooga NAA; however, an evaluation of those measures, such as RACT, can be performed to determine if 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. The budget presented in this section applies to the Georgia portion of the Chattanooga NAA only.

4.1 Pollutants

For Catoosa and Walker counties, 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 Chattanooga, 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 Chattanooga. 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 Chattanooga. 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 Chattanooga $PM_{2.5}$ Maintenance Plan, EPD worked closely with the Georgia Department of Transportation (GDOT) and the Chattanooga-Hamilton County-North Georgia Transportation Planning Organization (TPO) to develop the estimates of mobile source emissions for the Georgia portion of the Chattanooga nonattainment area. The Chattanooga-Hamilton County-North Georgia Transportation Planning Organization is the metropolitan planning organization (MPO) for the Chattanooga urbanized area. Mobile source inventories for 2025 were developed using the latest available planning assumptions, the most recent travel demand model, EPA's latest motor vehicle emission factor model, and, in the case of Georgia counties in the MPO, 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 2025 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) were determined from a county-specific travel demand model and/or HPMS traffic count data. Vehicle emissions factors were determined from a motor vehicle emissions model. See Appendix C-3 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 2025 emission factors with all currently known 2025 mobile source control rules in place. The MOVES model was run in rate look-up 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 by vehicle population. Note that rate-per-profile emissions (i.e., vapor venting) are not applicable to $PM_{2.5}$ modeling.

The Chattanooga TPO travel demand model is developed and maintained by Cambridge Systematics, Inc., and model output for the Georgia portion of the MPO is managed 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 the Chattanooga TPO. Off-model techniques based on HPMS data were used to calculate emissions for the portion of Walker County that falls outside the Chattanooga MPO area but is still inside the non-attainment area (referred to as a "donut" area).

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 Chattanooga interagency consultation committee for review in November of 2011. The assumptions used to develop Chattanooga'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 2025 on-road motor vehicle emissions for direct $PM_{2.5}$ and NO_x are 36 and 1,022 tons, respectively. A budget for SO_2 is not required. On-road emissions of SO_2 are considered to be "*de-minimis*" (70FR 24283), and, 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 22.8 percent above the projected 2025 on-road emissions. In a worst-case scenario, the needed annual safety margin for the MVEB would be 8.2 tons resulting in an overall MVEB of 44.2 tons per year.

The worst-case daily motor vehicle emissions projection for NO_x is 35.7 percent above the projected 2025 on-road emissions. In a worst-case scenario, the needed annual safety margin for the MVEB would be 364.6 tons resulting in an overall MVEB of 1,386.5 tons per year.

Table 4-1. 2025 Motor Vehicle Emissions, Emissions Budgets, and Safety Margins

Pollutant	Projected 2025 On-Road Emissions (tons)	Safety Margin Allotted to MVEB (%)	Safety Margin Allotted to MVEB (tons)	MVEB* with Safety Margin (tons)
$PM_{2.5}$	36.0	22.8	8.2	44.2
NO_x	1,021.8	35.7	364.6	1,386.5

*MVEB for the Georgia portion of the Chattanooga NAA.

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	*2007 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2025 (tons)
Point - total	280	285	287	290	295
Area - total	77	81	82	84	87
Non-road- total	27	8.8	0.8	0.8	0.9
Onroad	20	17	15	14	11
Total	404	391	385	389	394

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

Source	*2007 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2025 (tons)
Point - total	48	49	49	50	52
Nonpoint - total	359	397	414	430	456
Non-road - total	633	450	372	336	277
Onroad	4,442	3,112	2,542	1,972	1,022
Onroad Safety Margin					364.6
Total	5,482	4,009	3,377	2,788	2,171

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

Source	*2007 attainment* (tons)	2014 (tons)	2017 (tons)	2020 (tons)	2025 (tons)
Point - total	0	0	0	0	0
Nonpoint - total	1,548	1,729	1,807	1,878	1,998
Non-road - total	51	38	32	28	22
Onroad	134	96	80	63	36
Onroad Safety Margin					8.2
Total	1,733	1,863	1,918	1,970	2,064

The supporting documentation to show that the above conditions have been met for the Georgia portion of the Chattanooga nonattainment area is contained in this document. Based on the 2007-2009 monitored design value for the Chattanooga 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 2025 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 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 Chattanooga'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 Georgia portion of the Chattanooga nonattainment area, Catoosa and Walker counties, be redesignated from nonattainment to attainment with respect to the 1997 annual NAAQS for fine particulate matter. In addition, 2025 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; Alabama, Georgia, and Tennessee: Chattanooga, Final Rule"; 76 FR 31239 – 31241.

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, 2007, and 2008.

USEPA, "Procedures for Processing Requests to Redesignate Areas to Attainment," Memorandum from John Calcagni, September 4, 1992.

Georgia's Redesignation Request and Maintenance Plan for the Chattanooga Nonattainment Area for the 1997 $PM_{2.5}$ NAAQS For Catoosa and Walker Counties

August 31, 2012

Prepared by:

Georgia Department of Natural Resources

Environmental Protection Division

Air Protection Branch