

PM-10 Redesignation Request and Maintenance Plan For the Denver Metropolitan Area

**Adopted by:
Colorado Air Quality Control Commission
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of Public Health
and Environment**

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* See *PM-Appendices-Apr19.pdf*

INTRODUCTION AND BACKGROUND

Chapter 1, *Introduction*, is provided as background information only and is not to be construed to be part of the federally-enforceable State Implementation Plan.

Chapter 2, *Overview of Maintenance Plan Analysis*, describes various components of the technical analysis for the maintenance plan. This is also provided as background information only and is not to be construed to be part of the federally-enforceable State Implementation Plan.

REDESIGNATION REQUEST AND MAINTENANCE PLAN

Chapter 3, *Requirements for Redesignation*, is the State's request to the U.S. Environmental Protection Agency (EPA) to redesignate the Denver area to attainment for the one-hour ozone standard.

Chapter 4, *Maintenance Plan*, is being submitted for inclusion in the federally-enforceable State Implementation Plan and includes control measures and other requirements to ensure maintenance of the PM-10 standard through the year 2015.

INTRODUCTION AND BACKGROUND

CHAPTER 1: INTRODUCTION

The State of Colorado, in coordination with the Regional Air Quality Council (RAQC), is requesting that the U.S. Environmental Protection Agency (EPA) redesignate the Denver metropolitan nonattainment area to attainment status for the 24-hour PM_{10} National Ambient Air Quality Standard. The Denver metropolitan area has been designated as a PM_{10} nonattainment area since 1987, but has not violated this 24-hour PM_{10} standard since 1993. Therefore, the area is now eligible for redesignation.

The maintenance plan, which is being submitted for inclusion in the State's federally-enforceable State Implementation Plan (SIP), provides for maintenance of the national standard for PM_{10} in the Denver metropolitan area through 2015. The Maintenance Plan has been approved by the Regional Air Quality Council (RAQC) and the Colorado Air Quality Control Commission (AQCC), and complies with all federal requirements.

! Regional Air Quality Council

The Regional Air Quality Council is designated by Governor Owens as the lead air quality planning agency for the Denver metropolitan area. In this capacity, the mission of the RAQC is to develop effective and cost-efficient air quality initiatives with input from state and local government, the private sector, stakeholder groups, and private citizens. The RAQC's primary task is to prepare state implementation plans (SIPs) for compliance with federal air quality standards. The RAQC consists of a nine-member board appointed by the Governor. The board is comprised of local government, state agency, and citizen representatives.

! Colorado Air Quality Control Commission

The Colorado Air Quality Control Commission (AQCC) is a regulatory body with responsibility for adopting air quality regulations consistent with State statute. This includes the responsibility and authority to adopt State Implementation Plans (SIPs) and their implementing regulations. The Commission takes action on SIPs and regulations through a public rule-making process. The Commission has nine members who are appointed by the Governor and confirmed by the State Senate.

A. National Ambient Air Quality Standards for PM_{10}

In 1971, the EPA set National Ambient Air Quality Standards (NAAQS) for several air pollutants, including total suspended particulates (TSP), defined as particles with an aerodynamic diameter of less than 40 microns. In 1987, the EPA changed the particulate matter standard to include only those particles with an aerodynamic diameter of less than or equal to 10 microns (commonly referred to as PM_{10}). The current PM_{10} NAAQS allow for a maximum annual average of 50 micrograms per cubic meter ($\mu g/m^3$) and a 24-hour average of 150 $\mu g/m^3$. Essentially, the 24-hour PM_{10} NAAQS may not be exceeded more than three times over any three year period.

There are both primary and secondary air quality standards. The primary standards are set to protect human health, with a margin of safety to protect the more sensitive persons in the population, such as the very young, elderly and the ill. Secondary standards are set to protect property, materials, aesthetic values and general welfare. For PM_{10} , the national primary and secondary standards are the same. The numerical levels of the standards are subject to change, based on new scientific evidence summarized in air quality criteria documents.

As stated in the Code of Federal Regulations (40 CFR Part 50.6),

The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above $150 \mu\text{g}/\text{m}^3$ is equal to or less than one (based on 3-year average), and the annual arithmetic mean concentration is less than or equal to $50 \mu\text{g}/\text{m}^3$ (based on 3-year average) as determined by Appendix K.

In general, demonstrating attainment requires collecting representative air monitoring data and using approved measuring instruments and procedures, with adequate quality assurance and quality control. The three most recent years are examined, during which the average annual number of exceedances must be less than or equal to one. The standard allows for a maximum annual average of $50 \mu\text{g}/\text{m}^3$ and a 24-hour average of $150 \mu\text{g}/\text{m}^3$. The 24-hour standard may not be exceeded more than three times over any three year period. Air quality measurements in the Denver area satisfy this requirement, as shown in Section 2. "Attainment of the PM_{10} Standard."

B. Denver Metropolitan Nonattainment Area Classification History

Because of observed problems with air particles, monitoring of TSP began in the 1960's and continued through 1987. In 1987, based on relatively high TSP levels, the Denver area was designated as a "Group I" nonattainment area for PM_{10} . The Denver area was then designated a "moderate" nonattainment area in 1990 pursuant to section 107(d)(4)(B) of the CAA. This designation was for the 24-hour PM_{10} NAAQS; the area has never violated the annual PM_{10} NAAQS.

C. Denver Metropolitan PM_{10} Attainment/Maintenance Area

The Denver Metro area PM_{10} attainment/maintenance boundaries are defined by the Air Quality Control Commission as follows:

All of Denver, Jefferson, and Douglas Counties; Boulder County (excluding Rocky Mountain National Park) and the Automobile Inspection and Readjustment Program portions of Adams and Arapahoe Counties.

A map describing the attainment/maintenance area boundaries is included in Chapter 3, Figure 3-1.

D. Required Components of a Redesignation Request

Sections 107(d)(3)(d) and (e) of the Clean Air Act define the criteria an area must meet before being redesignated to attainment/maintenance status. Upon submittal and EPA approval of this Maintenance Plan, the Denver metropolitan area will meet all of these criteria.

1. Attainment of the Standard

The State must show that the area has attained the national standards for PM₁₀.

2. State Implementation Plan Approval

The area must have a fully approved PM₁₀ State Implementation Plan.

3. Improvement in Air Quality due to Permanent and Enforceable Emissions Reductions

The State must demonstrate that the improvement in air quality leading to attainment of the standard is due to permanent and federally enforceable emissions reductions.

4. CAA Section 110 and Part D Requirements

The State must meet all requirements of Section 110 and Part D of the CAA. Section 110 describes general requirements for SIPs, while Part D pertains to general requirements applicable to all nonattainment areas.

5. Maintenance Plan

The area must have a fully approved PM₁₀ Maintenance Plan that meets the requirements of CAA Section 175a, including a demonstration that the area will maintain the standard for a period of at least 10 years following redesignation by EPA. The plan must also contain contingency measures that could be implemented if a violation of the standard is monitored at any time during the maintenance period.

CHAPTER 2: OVERVIEW OF MAINTENANCE PLAN ANALYSIS

A. Air Quality Modeling Analysis

EPA guidance requires that the same level of modeling analysis be performed in maintenance plans that was used to demonstrate attainment in an attainment plan. Analysis of PM₁₀ concentrations for the PM₁₀ Attainment SIP (approved by EPA in 1997) was performed through several modeling approaches, including dispersion modeling. The modeling approach is documented in the original Technical Support Document (1993) that was developed to support the attainment SIP (Volume II, App.A; Volumes VI-XI).

This maintenance plan uses the same modeling protocols that were used in the attainment SIP and approved by EPA. Future year emission inventories have been updated as an input into the modeling analysis.

1. Emission Inventories

Estimates of future emissions of PM-10 and PM-10 precursors (NO_x and SO₂) are derived using a variety of EPA-approved methods. Inventories are developed for categories of mobile, area, and point sources for 2002, 2003, 2005, 2010, and 2015.

The emission inventories are calculated using estimates of future regional and zonal activity levels such as population, employment, industrial activity, and vehicle miles traveled. Emissions from specific source categories are based not only on EPA emission factors but they are also supplemented by local studies that take into account local conditions and factors. Emission estimates also factor in current and future federal, state and local regulations that will reduce emissions from source categories.

Once emission inventories for all sources are developed, they serve as inputs into dispersion or other modeling techniques that estimate ambient concentrations and contributions from various source categories.

2. Dispersion Models

The time averaging binary outputs from the two models discussed below are combined both in time and space to access the primary PM₁₀ concentrations.

a. Regional Air Model (RAM)

Primary PM₁₀ emissions from area sources, mobile sources and minor point sources are evaluated using RAM, a computer-based model formulated around the assumptions of steady-state Gaussian dispersion. RAM was run with five years of meteorological data (1985-89) using seasonally and hourly adjusted source data.

b. Industrial Source Complex (ISC) Model

Primary PM₁₀ emissions from major stationary sources are evaluated using the short-term version of the ISC model, which is also a steady-state Gaussian plume model. ISC is used to assess concentrations from a wide variety of sources associated with industrial source complexes. ISC can account for settling and dry deposition of particulates, downwash area, plume rise and limited terrain adjustment. Major sources are modeled at their maximum hourly design rates, with regulation and permit supported emissions limits and controls. ISC was run using the same five years of meteorological data.

3. Secondary Particulate Roll-Foward Model

Since there were no EPA-approved dispersion models that could estimate the formation and concentration of secondary particles, a surrogate approach had to be developed for the attainment SIP to estimate future changes in secondary particulate concentrations based on changes in precursor pollutants. The PM₁₀ Attainment SIP used Chemical Mass Balance receptor modeling to establish the total secondary contribution for 1989, which was then apportioned among the source categories by a proportion consistent with the (NO_x and SO₂) precursor inventory emissions. Predicted levels of secondary particulate in future years are calculated using a simple linear “roll-forward” model based on changes in the emissions inventory of both pollutants from all sources.

Documentation of this approach is contained in Calculation of Secondary PM₁₀ Concentrations in the Denver PM₁₀ SIP Attainment Demonstration, EPA April 1994, and in Volume XIV, App. B (Revised 1994) in the original Technical Support Document.

4. Background Concentration

The modeling analysis includes a background concentration, which was developed for the PM₁₀ Attainment SIP, to account for the impact of source emissions not considered in the modeling discussed above. Five years of particulate data from monitors in Estes Park and Limon and five years of meteorological data from Stapleton International Airport were used to establish background concentrations.

B. Street Sanding/Sweeping

1. Background

The PM₁₀ Attainment SIP addressed material specifications for street sanding material, street sanding guidelines and the development of local management plans in cooperation with state and local street maintenance officials and street sand suppliers. Local studies established the uncontrolled PM₁₀ emissions rate from the winter time sanding streets in the Denver metro area for the 1989 time frame. Combined with DRCOG VMT estimates uncontrolled PM₁₀ emissions were then calculated. Local studies and EPA protocols were used to estimate control strategy effectiveness. The Air Quality Control Commission Regulation 16 was included as a SIP strategy and established specific requirements for materials, sanding reductions, sweeping and reporting.

All sanding emissions reductions are calculated based on the established 1989 emissions rate and the difference between a sanding agency's baseline sand application rate (lbs/ lane mile) and the current sand application rate. Sweeping emissions reduction are based on control rate and percent of reported network swept within four days of a sanding event.

In the interim years since the attainment SIP was developed, state and local street maintenance officials and street sand suppliers continued to work with the RAQC to improve estimating techniques. Uncontrolled emissions are still based on the original 1989 emissions rates times the VMT from DRCOG estimates. However, the CDOT report Street Sanding & Sweeping (Cowherd, 1998) indicates that the sand fraction of the Paved Road Dust in the Denver area is 60% in wintertime, a change from the previously used 33.8%. Also, the RAQC's Emission Benefit Analysis (September 1999) and Emission Benefit Study (Alpha Trac, Inc. August 1999) established improved emission reduction credits for various sweeping equipment applied to the sand and dust fractions, when roadways are swept within four days of a sanding event. These improved estimating techniques are used in the calculations contained in this maintenance plan.

2. Previous State-only Requirements

In 1999 a state-only provision was added to Regulation 16 (effective October 2000) requiring an overall 30% emissions reduction (20% in the foothills) from sanding/sweeping operations. This regulation allows each agency to determine their own plan for achieving the requirement based on guidance provided on the benefit of various strategies. Specific SIP requirements for the Central Business District, the Sweep Box area (38th, Downing, Louisiana and Federal) and the remaining metro area were not changed in the 1999 regulation.

Although the state-only provision did not become effective until October 2000, the regional average emissions reduction in the 1999-2000 winter season was approximately 44%.

3. Conformity Commitments

As part of its conformity determination for the 2020 Regional Transportation Plan and implementing transportation improvement programs Denver Regional Council of Governments (DRCOG) received commitments for specific sanding reductions and increased sweeping from local governments, CDOT and RTD in 1998 for the years 2001, 2011 and 2020. These commitments are used by DRCOG to demonstrate that the region's PM₁₀ mobile source related emissions conform to the PM₁₀ Emissions Budgets established in the SIP process. In general, the commitments for 2011 and 2020 go beyond the current state-only requirements; however, DRCOG only uses those commitments necessary to demonstrate conformity.

4. Maintenance Plan Analysis

Analysis for the maintenance plan indicates that it will be necessary to take SIP credit for the current 30% emission reductions requirement in Regulation 16 to demonstrate maintenance of the standard in 2002 and beyond.

In addition, additional reductions will be needed to demonstrate maintenance in 2002 and beyond. Analysis indicates a 50% emission reduction in the central Denver area (bounded by 38th, Downing, Louisiana, and Federal) and a 72% emission reduction in the central business district (bounded by Colfax Avenue, Broadway, 20th Street, Wynkoop and Speer Boulevard) will show maintenance of the standard. The City and County of Denver already plans to achieve

these reductions during the 2001/02 winter season and has committed to including these reductions in the SIP.

Therefore, Regulation 16 has been revised as follows:

1. Current state-only requirement of 30% emissions reduction regionwide (20% in the foothills) will become part of the SIP.
2. 50% emissions reduction will be required in the central Denver area (bounded by 38th, Downing, Louisiana, and Federal), effective beginning the 2001/02 winter season.
3. 54% emissions reduction on I-25 from 6th Avenue to University (which is equivalent to the previous Regulation 16 and SIP requirement of 50% reduction in applied sand and sweeping within four days).
4. 72% emission reduction in the central business district (bounded by Colfax Avenue, Broadway, 20th Street, Wynkoop and Speer Boulevard), effective beginning the 2001/02 winter season.

C. Mobile Source Strategies

1. Emission Modeling

Estimates of future mobile source emissions are based on the following:

- a. Transportation data sets provided by DRCOG, which are the same as those contained in the recent conformity determination for the fiscally-constrained Regional Transportation Plan and 2001-2006 Transportation Improvement Program (November 2000).
- b. MOBILE5 mobile sources emissions model estimates for NOx .
- c. Inventory adjustment factors supplied by EPA to reflect credits from recently promulgated Tier II/ gasoline sulfur standards.
- d. PART5 mobile source particulate emissions model for estimates of primary PM-10 emissions from gasoline and diesel vehicles.

2. Tier II/Gasoline Sulfur Standards

The mobile source emission inventories in the maintenance plan take credit for the Tier II/ gasoline sulfur standards promulgated by EPA in February 2000. These standards will begin in 2004 through a 4-year phase in period. These standards are expected to reduce tailpipe NOx emissions by more than 90%.

The maintenance plan does not take credit for diesel emission and fuel standards promulgated by EPA in December 2000. These new standards will significantly reduce emissions of fine particulates and NOx from diesel vehicles.

3. Vehicle Inspection/Maintenance

The maintenance plan included the gasoline vehicle inspection/maintenance program contained in revisions adopted by the Air Quality Control Commission on January 10, 2000 and submitted to EPA on May 10, 2000 as part of the carbon monoxide maintenance plan and redesignation request. The program implements a remote sensing clean screen program beginning 2002 and contains increasingly tighter emission testing cutpoints for NOx implemented between 2002 and 2006.

4. Diesel Inspection/Maintenance

The maintenance plan removes Regulation No. 12 that implements the region's diesel inspection/maintenance program from the SIP. No emission reduction is taken for this strategy in the plan.

The program is expected to remain as a state-only requirement and improvements may be made to increase the effectiveness of the program.

5. Oxygenated Gasoline

The maintenance plan removes Regulation No. 13 concerning oxygenated gasoline from the PM-10 maintenance plan. No emission credit is taken for this strategy in the plan. Regulation No. 13 remains part of the carbon monoxide maintenance plan.

6. Transportation System Improvements

The mobile source modeling is based upon the transportation network contained in DRCOG's updated fiscally-constrained Regional Transportation Plan (November 2000). The network contains transit and highway system improvements. However, none of these system improvements should be construed to be specific transportation control measures in the maintenance plan.

D. Stationary Sources

1. Modeling and Emissions Calculation Criteria

This maintenance plans employs the same modeling approach and rationale for stationary sources approved by EPA for use in the PM-10 attainment SIP. The analysis distinguishes between major and minor stationary sources of PM-10, NOx and SO₂ for purposes of inventory development and air quality modeling.

Consistent with EPA regulations and guidance, major stationary sources generally are modeled at their maximum allowable emissions, which is the emission rate of a stationary source

calculated taking into account its maximum rated capacity, its physical and operational design, continuous operation, and any federally-enforceable limitations on emissions.

Allowable emission estimates for major stationary sources were updated using the Title V permit applications for these sources. In most instances the emission estimates were verified with the sources.

Minor sources were modeled using their actual emissions. To account for future growth in minor sources, these emissions were grown into the future using population growth factors.

2. Major Sources of PM-10

Major sources of PM-10 for purposes of modeling are defined as any stationary source that emits, or has the potential to emit, 100 tons per year (TPY) or more of PM-10 facility-wide. These sources are modeled at their maximum allowable emissions using the ISC model described in section A above. These sources are summarized below.

**Table 2.1: Major PM-10 Sources
in PM-10 Modeling Domain**

Source	Maximum Allowable PM-10 Emissions (tons per year)
Cherokee Electric Generating Station	3297
Arapahoe Electric Generating Station (2002)	1444
Arapahoe Electric Generating Station (2003-2015)	1001
Trigen Colorado Energy	838
Zuni Electric Generating Station	555
Ultramar Diamond Shamrock Refinery	241
Conoco Refinery	226
Robinson Brick	186

Enforceable emission limitations for all of these sources except the two refineries are contained in Regulation No. 1. For the Conoco and Ultramar Diamond Shamrock refineries, emissions are modeled at their maximum potential to emit based on AP-42 emission factors. The specific emission limitations or emission rates are converted into grams/second and modeled using actual facility stack parameters.

3. Major Sources of NOx and SO₂

a. Modeling Protocol

In the modeling protocol approved for the Denver PM-10 attainment SIP, EPA determined that modeling guidance for secondary particulate precursors can be viewed in a similar fashion to modeling for ozone precursors. Like ozone, secondary particulates are not emitted directly but are formed in the atmosphere through complex chemical reactions and conditions. They behave like ozone in that secondary particulate concentrations exhibit a pattern with relatively flat localized gradients.

EPA's ozone modeling guidance generally treats stationary sources as background sources where such sources do not need to be modeled with their maximum allowable emissions. Instead, emission estimates for stationary sources for modeling purposes are derived from allowable emission limits and actual (not design) operating levels.

Based on this similarity, EPA concluded that flexibility afforded by the modeling guidance should be exercised when modeling emissions of NOx and SO₂ from stationary sources. EPA determined that any major stationary source emitting NOx and SO₂ could be modeled at its anticipated actual emissions in the attainment demonstration if two criteria were met:

- 1) *the difference between modeling at actual versus allowable emission rates for any excluded source must be less than a de minimus level of 1 ug/m³ secondary PM₁₀ (using the secondary particulate roll-forward model described in A.2 above), and*
- 2) *the cumulative difference for all excluded sources must be no more than 2 ug/m³.*

Major stationary sources that do not meet these criteria must be analyzed using their maximum allowable emissions for NOx and SO₂. EPA concluded these sources may operate at levels approaching their maximum allowable emissions for short periods of time and may have greater impact on secondary particulate levels.

Using this criteria, the stationary sources modeled at their maximum allowable emission rates for NOx and SO₂ are listed in Table 2.2.

Table 2.2: Major NOx and SO₂ Sources

Source	Maximum Allowable Emissions (tons per year)	
	NOx	SO ₂
Cherokee Electric Generating Station (2002-2004)	23,577	34,683
Cherokee Electric Generating Station (2005-2015)	21,382	34,683
Arapahoe Electric Generating Station (2002)	14,250	17,498
Arapahoe Electric Generating Station (2003-2015)	7,770	10,224
Valmont Electric Generating Station	4,474	8,890
Trigen-Colorado Energy Corp.	3,962	6,959
Rocky Mountain Bottle	424	369

For roll-forward modeling to estimate their potential contribution to secondary particulate concentrations, the maximum allowable daily emissions are calculated using the maximum allowable emission rate (lb/mmbtu, lb/hour, tons per year, etc.) and the rated design capacity of the facility. Where an annual permit limit restricts the annual hours of operation, the maximum hourly rate is used to calculate the maximum daily rate.

b. Emission Limitations

The electric generating stations are subject to federally-enforceable limitations contained in state and federal regulations. Table 2.3 summarizes these limitations.

1. Public Service Company Power Plants

Regulation No. 1 contains existing SO₂ emission limitations for all metro area power plants and NOx limits for Cherokee Units 3 and 4, Arapahoe Unit 4, and Valmont Unit 5.

Revisions to Regulation No. 1 that were adopted as part of this maintenance plan includes the following new limitations for metro area power plants:

- 0.88 lb/mmbtu SO₂ limit for Cherokee Units 1 and 4 and Arapahoe Unit 4, based on a 30-day rolling average from November 1 to March 1. This limitation is effective upon approval of the redesignation request by EPA.

This limit is essentially equivalent to the existing 20% annual SO₂ removal requirement in Regulation 1 for Arapahoe Unit 4 and in a permit for Cherokee Units 1 and 4. However, the limitation is now expressed on a more straight-forward basis over a shorter averaging time.

- Retirement of Arapahoe Units 1 and 2 as a federally-enforceable control measure, effective January 1, 2003 and upon approval of the redesignation request by EPA. Through an enforceable agreement with the State of Colorado, Public Service Company committed to retire Arapahoe Units 1 and 2 permanently by the effective date. Since these units will not be operating after January 1, 2003, these units are not included in any future year emission inventory calculations beyond 2002.

This limitation does not prevent the construction or operation of a new source on the site of such units, provided any such new source complies with all laws and regulations applicable to the new sources.

- 0.60 lb/mmbtu NOx limit for Cherokee Unit 1, based on a 30-day rolling average. This limit is effective January 1, 2005 provided EPA approves the redesignation request. This unit is already well within this limitation with the application of overfire air and low-NOx burners.

Also as part of this enforceable emission reduction agreement with the State of Colorado, Public Service Company will go significantly beyond current regulatory requirements by reducing its current overall SO₂ emissions by at least 50% at its metro area power plants. However, this SO₂ emission reduction program is not included in the SIP and no credit is taken for the emission reductions that will be achieved.

2. Trigen-Colorado Energy

Regulation No. 1 contains existing SO₂ emission limitations for Trigen's boilers. Boilers 4 and 5 are subject to NOx limits established by 40 CFR Part 60 (New Source Performance Standards). Boilers 1, 2, and 3 do not have regulatory NOx limits and therefore are modeled at their maximum potential to emit using AP-42 emission factors.

3. Rocky Mountain Bottle

Rocky Mountain Bottle Company is subject to a permit issued by the State of Colorado that establishes hourly limits for NOx and SO₂. Since the limits are based on the facility's maximum potential to emit, the permit does not need to be included in the SIP for modeling purposes.

Table 2.3: Summary of Current Emission Limitations and/or Modeling Parameters at Metro Area Electric Generating Stations

Unit	PM ₁₀ limit (lb/mmbtu)	Regulation	NOx limit (lb/mmbtu)	Regulation	SO ₂ limit (lb/mmbtu)	Regulation
Cherokee						
1	0.1	Reg. No. 1	0.6 ⁽¹⁾	Reg. No. 1	0.88 ⁽²⁾	Reg. No. 1
2	0.1	Reg. No. 1	0.8 ⁽³⁾ (0.96)	40 CFR Part 76 (maximum. potential to emit)	1.1 ⁽⁴⁾	Reg. No. 1
3	0.1	Reg. No. 1	0.6 ⁽¹⁾	Reg. No. 1	1.1 ⁽⁴⁾	Reg. No. 1
4	0.1	Reg. No. 1	0.45 ⁽¹⁾	Reg. No. 1	0.88 ⁽²⁾	Reg. No. 1
Arapahoe						
3	0.1	Reg. No. 1	0.8 ⁽³⁾ (0.98)	40 CFR Part 76 (maximum. potential to emit)	1.1 ⁽⁴⁾	Reg. No. 1
4	0.1	Reg. No. 1	0.6 ⁽¹⁾	Reg. No. 1	0.88 ⁽²⁾	Reg. No. 1
2 gas turbines	3 lb/hr ea.	maximum potential to emit	31 lb/hr ea.	maximum potential to emit	n/a	
Valmont						
5	0.1 ⁽⁵⁾	Reg. No. 1	0.45 ⁽¹⁾	Reg. No. 1	1.1 ⁽⁴⁾	Reg. No. 1
6	0.1 ⁽⁵⁾	Reg. No. 1			n/a	
2 gas turbines	3 lb/hr ⁽⁵⁾ ea.		31 lb/hr ea.	maximum potential to emit	n/a	
Trigen						
1 & 2 (gas)	0.11	Reg. No. 1	no limit	maximum potential to emit	n/a	
3	0.12	Reg. No. 1	no limit	maximum potential to emit	1.8 ⁽⁴⁾	Reg. No. 1
4	0.1	Reg. No. 1	0.7 ⁽⁴⁾	40 CFR Part 60	1.2 ⁽⁴⁾	Reg. No. 1
5	0.1	Reg. No. 1	0.7 ⁽⁴⁾	40 CFR Part 60	1.2 ⁽⁴⁾	Reg. No. 1

(1) 30-day rolling average; (2) 30-day rolling average Nov. 1 to March 1; (3) annual average, averaged over entire facility; however, these units are modeled at their maximum potential to emit; (4) 3-hour average, (5) Valmont is not located in the primary PM-10 modeling domain.

**REDESIGNATION REQUEST
AND
MAINTENANCE PLAN**

CHAPTER 3: REQUIREMENTS FOR REDESIGNATION

The State of Colorado, in coordination with the Regional Air Quality Council (RAQC), requests that the U.S. Environmental Protection Agency (EPA) redesignate the Denver metropolitan nonattainment area to attainment status for the 24-hour PM₁₀ National Ambient Air Quality Standards (NAAQS). The Denver metropolitan area was designated as a moderate PM₁₀ nonattainment area since 1990, but has not violated the 24-hour standard since 1993. The Denver area has never violated the annual PM₁₀ NAAQS. Therefore, the area is now eligible for redesignation.

A. Required Components of a Redesignation Request

Sections 107(d)(3)(D) and (E) of the CAA define the following five required components of a redesignation request.

- ◆ **Attainment of the PM₁₀ NAAQS**
- ◆ **State Implementation Plan Approval**
- ◆ **Improvement in Air Quality Due to Permanent and Enforceable Emissions Reductions**
- ◆ **CAA Section 110 and Part D Requirements**
- ◆ **Approved Maintenance Plan**

The first four requirements are addressed below in this chapter. The fifth requirement, the Maintenance Plan, is addressed in Chapter 4.

B. Attainment of the PM₁₀ NAAQS

Attainment of the 24-hour PM₁₀ NAAQS, which is 150 micrograms per cubic meter (ug/m³) of PM₁₀ in ambient air (based on a 24-hour averaging time for the measurement) is demonstrated when the average annual number of expected exceedances is less than or equal to one. The following information demonstrates, as required by Section 107(d)(3)(E) of the Clean Air Act, that the Denver metropolitan area has attained the national 24-hour standard for PM₁₀. This demonstration is based on quality assured monitoring data collected throughout the Denver area, with focus on the monitors located in the central portion of the metro area.

1. Denver Area Historical Perspective

Historically, the particulate matter standard had been frequently violated in the 1970's, 1980's, and early 1990's throughout the Denver metropolitan area. There has only been one exceedance of the 24-hour standard during the 1994 through 1999 period. With the implementation of emission control programs aimed at reducing re-entrained fugitive dust, automobile and industrial emissions, PM₁₀ concentrations have stabilized at levels well below the NAAQS.

2. PM₁₀ Monitoring Network

The current PM₁₀ ambient air monitoring network in the Denver area consists of eleven stations operated by the Colorado Air Pollution Control Division. There have been other stations that have operated in the past as well as special purpose monitoring efforts that are ongoing (such as at the Rocky Flats facility). The geographical distribution of the current monitors is presented in Figure 3-1.

This section shall not be construed to establish a monitoring network in the federally-enforceable SIP. EPA has already approved a monitoring SIP for the State of Colorado and this description of the PM₁₀ monitoring network shall not be construed to amend such monitoring SIP.

3. Monitoring Results and Attainment Demonstration

The monitoring data presented in Table 3-1 verify that the Denver area is attaining 24-hour PM₁₀ NAAQS, in accordance with the federal requirements of 40 CFR Part 58. Since 1993, the three-year average of expected values greater than 150 ug/m³ ppm is less than or equal to one. Summary data from 1995 through 2000 are also shown in the following graphs.

4. Quality Assurance Program

PM₁₀ monitoring data for the Denver area have been collected and quality-assured in accordance with 40 CFR, Part 58, Appendix A, EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. 11; Ambient Air Specific Methods", the APCD's Standard Operating Procedures Manual, and Colorado's Monitoring SIP which EPA approved in 1993. The data are recorded in EPA's Aerometric Information Retrieval System (AIRS) and are available for public review at the APCD and through EPA's AIRS database. Table 3-2 presents the data recovery rates for each monitoring site.

Figure 3-1.
Map of the Denver Metropolitan PM₁₀
Attainment/Maintenance Area and Monitoring Sites

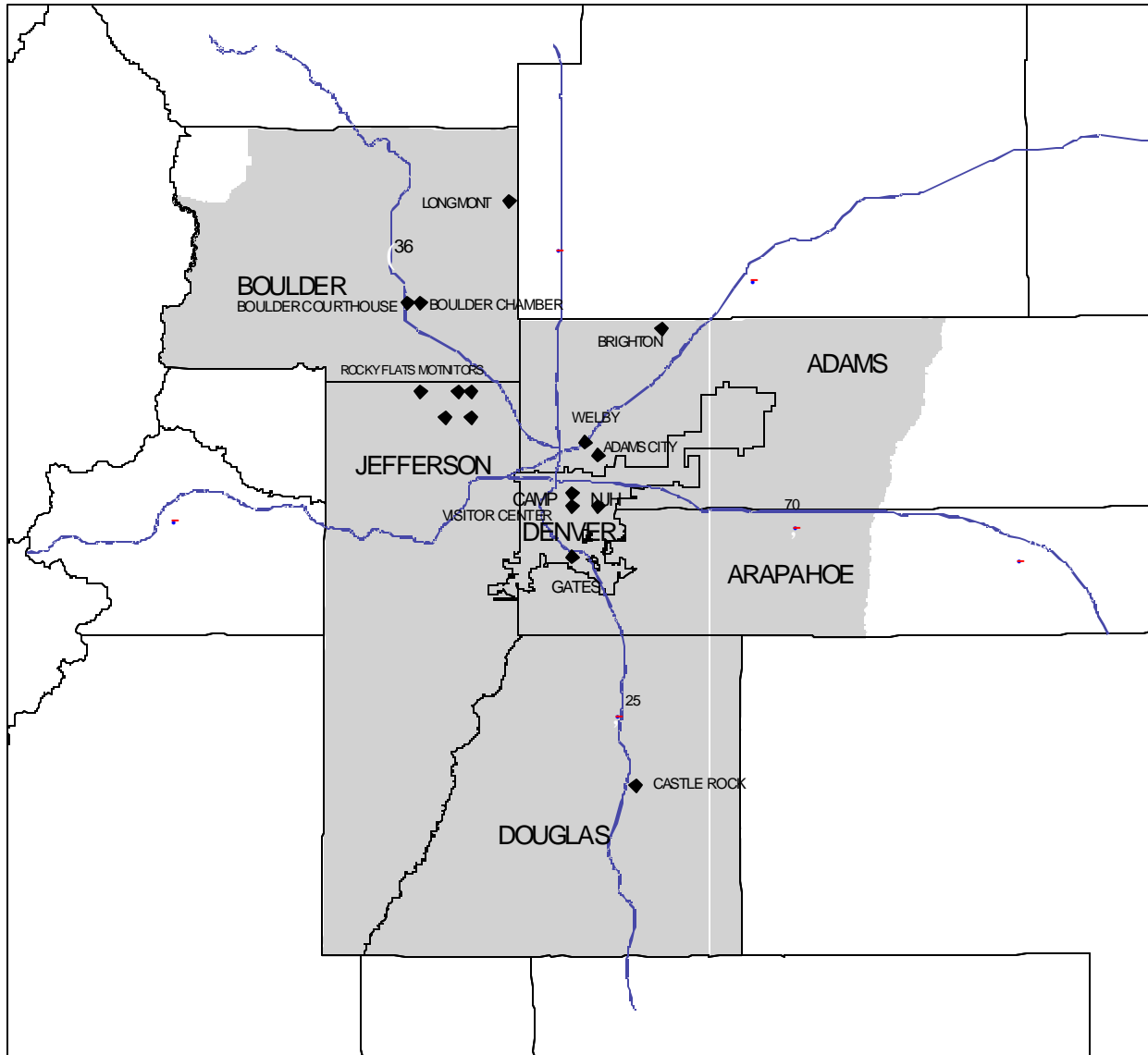


Table 3-1. Monitoring Data and Three-Year Average of Expected Exceedances of the PM₁₀ NAAQS

**PM₁₀ Concentrations 1995 through 2000
Denver Metro Area**

Adams City--4301 E. 72nd Ave.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	99	97	0.00	0.34	33
1996	98	96	0.00	0.00	34
1997	98	98	0.00	0.00	35
1998	118	99	0.00	0.00	36
1999	160	141	1.16	0.39	37
2000	135	134	0.00	0.39	43

Brighton--22 S. 4th Ave.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	101	84	0.00	0.00	21
1996	57	54	0.00	0.00	23 *
1997	86	71	0.00	0.00	23
1998	64	55	0.00	0.00	21
1999	42	35	0.00	0.00	19
2000	69	46	0.00	0.00	20*

Welby--78th Ave. & Steele St.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	73	46	0.00	0.00	21
1996	59	57	0.00	0.00	21 *
1997	60	46	0.00	0.00	22
1998	40	39	0.00	0.00	22
1999	44	42	0.00	0.00	22
2000	45	43	0.00	0.00	24

* Annual average was calculated with one or more quarters having less than 75% data recovery.

Welby Continuous PM₁₀--78th Ave. & Steele St.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	55	44	0.00	0.00	17
1996	59	58	0.00	0.00	19
1997	59	53	0.00	0.00	17*
1998	62	56	0.00	0.00	19
1999	50	49	0.00	0.00	15
2000	70	33	0.00	0.00	13*

Boulder--14th & Spruce

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	35	29	0.00	0.00	13 *
1996	41	31	0.00	0.00	16
1997	28	27	0.00	0.00	15
1998	<i>sampling ended 9-30-97</i>				
1999					
2000					

Longmont--3rd & Kimbark

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	91	61	0.00	0.00	19
1996	66	59	0.00	0.00	19
1997	44	41	0.00	0.00	18
1998	50	38	0.00	0.00	19
1999	58	56	0.00	0.00	21*
2000	91	68	0.00	0.00	23

Boulder Chamber Bldg.--2440 Pearl St.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	51	45	0.00	N / A	20
1996	39	35	0.00	0.00	20 *
1997	43	42	0.00	0.00	21
1998	47	45	0.00	0.00	24
1999	46	43	0.00	0.00	23*
2000	41	39	0.00	0.00	22*

* Annual average was calculated with one or more quarters having less than 75% data

CAMP Primary hi-vol--2105 Broadway

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	52	50	0.00	0.00	28
1996	59	54	0.00	0.00	28
1997	67	66	0.00	0.00	26
1998	48	47	0.00	0.00	27
1999	52	49	0.00	0.00	30
2000	60	57	0.00	0.00	34*

CAMP Continuous PM₁₀--2105 Broadway

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	75	65	0.00	0.00	21
1996	74	67	0.00	0.00	20
1997	86	71	0.00	0.00	23*
1998	108	81	0.00	0.00	31
1999	67	64	0.00	0.00	27*
2000	78	59	0.00	0.00	28*

Gates Primary hi-vol--1050 S. Broadway

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	57	45	0.00	0.00	27
1996	63	53	0.00	0.00	28
1997	94	93	0.00	0.00	29
1998	71	69	0.00	0.00	27
1999	61	47	0.00	0.00	28
2000	58	54	0.00	0.00	28

Denver Visitor's Center--225 W. Colfax

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	91	80	0.00	0.36	21
1996	81	70	0.00	0.00	23
1997	68	66	0.00	0.00	22
1998	77	75	0.00	0.00	30 *
1999	96	83	0.00	0.00	27
2000	74	72	0.00	0.00	29

* Annual average was calculated with one or more quarters having less than 75% data recovery.

Castle Rock--310 3rd St.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	34	32	0.00	0.00	15 *
1996	28	26	0.00	0.00	15 *
1997	54	54	0.00	0.00	21 *
1998	51	47	0.00	0.00	16 *
1999	49	24	0.00	0.00	16*
2000	52	31	0.00	0.00	15

Arvada--8101 Ralston Road

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	41	36	0.00	0.00	18
1996	56	38	0.00	0.00	20
1997	70	70	0.00	0.00	21 *
1998	47	46	0.00	0.00	23
1999	<i>sampling ended 12-31-98</i>				
2000					

Golden--911 10th St.

Year	1st Max. (ug/m ³)	2nd Max. (ug/m ³)	Yearly Estim. Exceed.	3 yr. avg. Estim. Exceed.	Annual Avg. (ug/m ³)
1995	38	37	0.00	0.00	16
1996	43	31	0.00	0.00	16 *
1997	33	28	0.00	0.00	24 *
1998	<i>sampling ended 6-30-97</i>				
1999					
2000					

* Annual average was calculated with one or more quarters having less than 75% data recovery.

Table 3-2. PM₁₀ Data Recovery Rates for Each Monitoring Site

PM₁₀ Data Recovery
(percent)

Denver Metro Area
1995 through 2000

Adams City--4301 E. 72nd Ave.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	> 100	> 100	100
1998	> 100	> 100	> 100	> 100	100
1999	> 100	> 100	> 100	> 100	100
2000	95	97	98	92	95

Brighton--22 S. 4th Ave.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	100	88	97
1998	100	90	90	94	93
1999	90	97	87	84	90
2000	97	87	Construction 9/20/00-2/22/01		

Welby--78th Ave. & Steele St.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	> 100	> 100	100
1998	> 100	93	100	81	94
1999	100	100	100	93	98
2000	75	87	100	93	89

Welby Continuous PM₁₀--78th Ave. & Steele St.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	> 100	> 100	100
1998	> 100	> 100	> 100	> 100	100
1999	> 100	> 100	> 100	> 100	100
2000	> 100	> 100	> 100	Sampler out 8/28/00-	

* Overall average is calculated based on 100% as a maximum recovery

Boulder--14th & Spruce

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	87	100	94	73	89
1996	87	100	100	100	97
1997	100	93	93	N/A	96
1998	<i>sampling ended 9-30-97</i>				
1999					
2000					

Longmont--3rd & Kimbark

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	93	100	98
1998	67	100	94	77	85
1999	87	100	87	70	86
2000	87	97	100	80	91

Boulder Chamber Bldg.--2440 Pearl St.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	100	93	100	87	95
1996	87	73	100	87	87
1997	100	87	80	94	90
1998	70	97	94	> 100	90
1999	93	100	93	69	89
2000	94	87	93	67	85

CAMP Primary hi-vol--2105 Broadway

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	80	93	94	> 100	92
1996	100	93	94	80	92
1997	100	100	87	> 100	97
1998	87	87	93	81	87
1999	100	90	construction 6-99		96
2000	60	93	100	93	96

**Overall average is calculated based on 100% as a maximum recovery*

CAMP Continuous PM₁₀--2105 Broadway

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	> 100	> 100	100
1998	> 100	> 100	> 100	> 100	100
1999	> 100	> 100	construction 6-99		100
2000	construction 6/99-11/01			>100	100

Gates Primary hi-vol--1050 S. Broadway

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	93	100	100	93	97
1996	100	100	100	100	100
1997	100	93	93	100	97
1998	100	80	93	88	90
1999	93	100	100	100	98
2000	100	100	100	93	98

Denver Visitor's Center--225 W. Colfax

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	> 100	> 100	> 100	> 100	100
1996	> 100	> 100	> 100	> 100	100
1997	> 100	> 100	> 100	> 100	100
1998	> 100	> 100	> 100	> 100	100
1999	> 100	> 100	> 100	> 100	100
2000	> 100	> 100	> 100	> 100	100

Castle Rock--310 3rd St.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	67	73	88	73	75
1996	80	60	81	93	79
1997	87	53	93	81	79
1998	7	93	100	100	75
1999	67	93	87	87	83
2000	94	100	100	93	97

**Overall average is calculated based on 100% as a maximum recovery*

Arvada--8101 Ralston Road

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	93	100	100	100	98
1996	93	100	100	100	98
1997	87	87	73	100	87
1998	100	87	100	81	92
1999	<i>sampling ended 12-31-98</i>				
2000					

Golden--911 10th St.

Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Overall
1995	93	93	88	93	92
1996	93	100	100	73	92
1997	33	33	N/A	N/A	33
1998	<i>sampling ended 6-30-97</i>				
1999					
2000					

*Overall average is calculated based on 100% as a maximum recovery

C. Approval of the PM₁₀ Nonattainment SIP Element for the Denver Area

A comprehensive PM₁₀ nonattainment SIP Element for Denver was approved by the EPA on April 17, 1997 (62 FR 18716).

D. Improvement in Air Quality Due to Permanent and Enforceable Emission Reductions

It is reasonable to attribute the improvement in ambient PM₁₀ concentrations in the Denver area to emission reductions which are permanent and enforceable. The Denver area has met the national standard for PM₁₀ as a result of effective State and federal emission reduction measures, as opposed to temporary or “chance” events.

A downturn in the economy is clearly not responsible for the improvement in ambient particulate levels in the Denver metropolitan area. Over the last ten years, the region has experienced strong growth while at the same time achieving a continuous attainment of the 24-hour and annual PM₁₀ NAAQS. The Colorado State Demographer’s Office reports that between 1990 and 2000, job growth in the Denver area increased at an annual rate of approximately three percent, population increased by about two percent each year, and personal income increased by approximately seven percent each year. In its 1997 Vehicle Miles Traveled (VMT) forecasting and tracking report, the Colorado Department of Transportation (CDOT) estimated a VMT increase of approximately eight percent between 1995 and 2000.

The existing control measures that have brought the Denver Metro area into attainment of the 24-hour PM₁₀ standard include a mix of re-entrained fugitive dust controls, woodburning restrictions, the state’s vehicle inspection/maintenance program and industrial source control regulations as follows:

1. Re-entrained Fugitive Dust Controls

One of the more important PM₁₀ control measures for the Denver metropolitan area is the restrictions on street sanding and required street sweeping as defined in Regulation No. 16. Street sand is required to meet stringent specifications to reduce the amount of fines and increase the durability of the sanding materials. Most metro-area governments were required to reduce the amount of street sand applied to their roadways by 20 percent from a base sanding amount; the City of Denver was required to reduce the amount of sand applied by 30-50 percent. Additionally, mandatory street sweeping is required in the central area after each sanding event.

2. Woodburning Restrictions

Woodburning has been restricted in the Denver metro area a number of different ways. First, wood stoves have become cleaner as State and federal emission control requirements have been phased in beginning in the mid 1980's. Since 1991, Colorado’s Regulation No. 4 requires all new stoves meet “phase III” requirements for reduced particulate emissions (phase III is equivalent to EPA’s national phase II requirements). Regulation No. 4 also prohibits conventional woodburning fireplaces in new construction (which became effective in 1993). This ban has dramatically slowed the growth in wood smoke emissions and has encouraged conversion of existing fireplaces to natural gas. Finally, and most significantly, Regulation No. 4 prohibits most

wood burning activity on “high pollution days” between November 1 and March 31 throughout the metro area. This mandatory woodburning curtailment program began in the mid 1980's.

3. Vehicle Inspection & Maintenance Program

Colorado's Automobile Inspection and Readjustment (AIR) Program is described in AQCC Regulation No. 11 and has been applicable in the Denver area since 1981. The AIR Program works to reduce NO_x pollutants from gasoline-powered motor vehicles by requiring them to meet emission standards through periodic tailpipe tests, maintenance, and specific repairs. NO_x emissions react in the atmosphere to form fine particulates. The AIR Program was updated in 1994 to meet the requirements of the Clean Air Act Amendments of 1990, and a more stringent and effective “enhanced” inspection program began in 1995. The enhanced program uses a loaded-mode dynamometer test called I/M 240 for 1982 and newer vehicles and an idle test for older vehicles and heavy trucks.

4. Industrial Source Controls

The State's comprehensive permit rules, AQCC Regulations No. 1, 3, and 6, control PM₁₀, SO₂ and NO_x matter emissions from power plants and industrial facilities. These rules also cap PM₁₀, SO₂ and NO_x emissions from new or modified major stationary sources. The State continues to enhance its permit and control programs, while simultaneously pursuing a strong inspection and enforcement presence, as authorized by the AQCC's “Common Provisions” regulation.

E. CAA Section 110 and Part D Requirements

For the purposes of redesignation, all of the general nonattainment area requirements of CAA Section 110 and Part D must be met. In general, the requirements of Section 110(a)(2) are:

- ◆ the establishment and implementation of enforceable emission limitations;
- ◆ the monitoring, compiling, and analyzing of ambient air quality data; preconstruction reviews and permitting of new and modified major stationary sources;
- ◆ consulting with and providing for the participation of local governments that are affected by the plan;
- ◆ assurance that the State has the adequate funds and authority to enforce the SIP Element and the associated regulations; and
- ◆ permit fees for stationary sources.

Colorado Revised Statute 25-7-111 requires the APCD to administer and enforce the air quality programs adopted by the AQCC. With a staff of 150 people and a budget of approximately \$13 million, the APCD has committed to implementing and enforcing the air quality plans and regulations applicable to the Denver Metropolitan PM₁₀ attainment/maintenance area.

The CAA's Part D, pertaining to nonattainment plan provisions, requires the following items to be addressed:

- ◆ the implementation of reasonably available control measures, including reasonably available control technologies (RACT) for existing sources
- ◆ reasonable further progress (RFP) towards meeting attainment
- ◆ the identification and quantification of allowable emissions for new and modified stationary sources
- ◆ a stationary source permitting program
- ◆ other measures: enforceable emission limitations, other control measures, schedule for compliance
- ◆ compliance with section 110 provisions
- ◆ contingency measures

All of the requirements of Section 110 and Part D have been met, as is required for approval of this maintenance plan and redesignation request. Most of the requirements for Section 110 and Part D are general requirements applicable to the state implementation in general, not just the state implementation plan for controlling PM₁₀ in the Denver area. All such general requirements are already included in the state implementation plan and have already been approved by EPA. Any requirements of Section 110 and Part D that apply specifically to the control of PM₁₀ in the Denver attainment/maintenance area are addressed elsewhere in this maintenance plan.

Other Part D requirements that are applicable in nonattainment and maintenance areas include the general and transportation conformity provisions of CAA Section 176 (c). These provisions ensure that federally funded or approved projects and actions conform to the Denver State Implementation Plan Element/Maintenance Plan for PM₁₀ prior to the projects or actions being implemented. The State has already submitted to EPA a State Implementation Plan revision implementing the requirements of section 176(c).

CHAPTER 4: MAINTENANCE PLAN

Section 107(d)(3)(E) of the CAA stipulates that for a nonattainment area to be redesignated to attainment, EPA must fully approve a maintenance plan which meets the requirements of CAA Section 175A. The maintenance plan is a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least ten years after redesignation by EPA.

Because EPA is allowed up to two years to approve redesignation requests after receiving a complete submittal, and given the time needed to complete the State processes for AQCC rule-making and legislative approval, the milestone year for this maintenance plan is 2015.

The EPA has established the core elements listed below as necessary for approval of maintenance plans:

- ◆ Description of the control measures for the maintenance period
- ◆ Emission inventories for current and future years
- ◆ Maintenance demonstration
- ◆ Mobile source emissions budget
- ◆ Approved monitoring network
- ◆ Verification of continued attainment
- ◆ Contingency plan
- ◆ Subsequent maintenance plan revisions

A. Maintenance Plan Control Measures

1. Control Measures Included in the Maintenance Plan

The Denver metropolitan area will rely on the control programs listed below to demonstrate maintenance of the 24-hour PM₁₀ standard through 2015. No emission reduction credit has been taken in the maintenance demonstration for any other current State or local control programs and no other such programs, strategies, or regulations shall be incorporated or deemed as enforceable measures for the purposes of this maintenance demonstration.

This maintenance plan does not include any "transportation control measures", as that term is defined at 40 CFR 93.101. Although section VIII.D of the Colorado State Implementation Plan for Particulate Matter (PM-10), Denver Metropolitan Nonattainment Area Element approved by the EPA in 1997 was entitled "TRANSPORTATION CONTROL MEASURES", the measures described in that section have not been incorporated into the SIP. Section VIII.D described the transportation network that was used to estimate the number of vehicle miles traveled in the nonattainment area, but it did not specify the inclusion of such measures in the SIP. In estimating the vehicle miles traveled for purposes of this maintenance plan, DRCOG made reasonable assumptions about the transportation network, but such assumptions are not codified as transportation control measures for incorporation into the SIP.

The maintenance plan takes credit for the following federally-enforceable control measures, which, except where otherwise noted, are included in the SIP:

a. Federal fuels and tailpipe standards and regulations

Credit is taken in this maintenance plan for current federal regulations concerning motor vehicles, fuels, small engines, diesels, and non-road mobile sources. This includes EPA's regulations adopted in February 2000 for Tier II/gasoline sulfur standards. While credit is taken for these federal requirements, they are not part of the Colorado SIP. The plan does not include nor take credit for EPA's standards for diesel vehicles and diesel sulfur, which were promulgated in December 2000.

b. Woodburning

Air Quality Control Commission Regulation No. 4 covers wood stoves, conventional fireplaces and woodburning on high pollution days, as approved by EPA as part of the federal SIP in 1997. This maintenance plan makes no changes to Regulation No. 4.

Many local governments in the Denver region have adopted ordinances or resolutions regulating woodburning activities within their jurisdictions. In its 1997 approval of the Denver region's PM-10 SIP, EPA incorporated by reference local woodburning ordinances and resolutions adopted by Arvada, Aurora, Boulder, Broomfield, Denver, Douglas County, Englewood, Federal Heights, Glendale, Greenwood Village, Jefferson County, Lafayette, Lakewood, Littleton, Longmont, Mountain View, Sheridan, Thornton, and Westminster. These ordinances and resolutions remain in the SIP, unless they are removed or revised through a SIP revision.

c. Street Sanding

Air Quality Control Commission Regulation No. 16 covers street sanding and sweeping requirements. Revisions to this regulation were adopted on April 19, 2001 in conjunction with this maintenance plan and impose additional SIP requirements (See Appendix A).

The revised Regulation No. 16 that is part of this maintenance plan requires:

- 30% emissions reduction region-wide (20% in the foothills),
- 50% emissions reduction in the central Denver area (bounded by 38th Ave., Federal Blvd., Louisiana Ave., and Downing St.),
- 54% reduction on I-25 between University and 6th Avenue; and
- 72% emission reduction in the central business district (bounded by Colfax Avenue, Broadway, 20th Street, Wynkoop and Speer Boulevard)

All of these requirements will be effective during the winter season of 2001/02 and throughout the period of the maintenance plan.

d. Automobile Inspection/Maintenance

Air Quality Control Commission Regulation No. 11 covers the Automobile Inspection and Readjustment (A.I.R.) Program as amended on January 10, 2000 and submitted to the EPA for approval on May 10, 2000 as part of the Denver area redesignation request and maintenance plan for carbon monoxide. The regulation establishes current and future cutpoints for NO_x emissions and implements a remote sensing clean screen program to augment the current inspection program. This maintenance plan makes no additional changes to Regulation No. 11.

e. Stationary Sources

Emissions from stationary sources of pollution are regulated by several Air Quality Control Commission Regulations:

- ◆ Regulation No. 1 regulates emissions of particulates, smoke, sulfur dioxide, and nitrogen oxides and establishes limits on these pollutants from covered sources. Sections I-IV, Sections VI-IX, and Appendices A and B are already included in the approved SIP. This maintenance plan incorporates the limits in the regulation in calculations of maximum allowable emissions for stationary sources.

Revisions to Regulation No. 1 that were adopted as part of this maintenance plan includes the following limitations for metro area power plants:

- 0.88 lb/mmbtu SO₂ limit for Cherokee Units 1 and 4 and Arapahoe Unit 4, based on a 30-day rolling average from November 1 to March 1. This limitation is effective upon approval of the redesignation request by EPA.
- Retirement of Arapahoe Units 1 and 2, effective January 1, 2003 and upon approval of the redesignation request by EPA. This limitation does not prevent the construction or operation of a new source on the site of such units, provided any such new source complies with all laws and regulations applicable to the new sources.
- 0.60 lb/mmbtu NO_x limit for Cherokee Unit 1, based on a 30-day rolling average. This limit is effective January 1, 2005 provided EPA approves the redesignation request.

Revisions to Regulation No. 1 also stipulate that Section VIII, Restrictions on the Use of Oil as a Backup Fuel, shall apply in the Denver PM₁₀ attainment/maintenance area in the same manner as it did for the Denver PM₁₀ nonattainment area.

- ◆ Regulation No. 3 lays out provisions of the State of Colorado's stationary source permitting program. Parts A and B of Regulation No. 3 are already included in the approved SIP. Part C implements the federal operating permit program and this reference to Part C of Regulation No. 3 shall not be construed to mean that these regulations are included in the SIP.

Although this maintenance plan makes no revisions to Regulation No. 3, revisions to the Ambient Air Quality Standards Regulation adopted as part of this maintenance plan retain the existing requirements for minor sources of PM₁₀ and PM₁₀ precursors to use reasonably available control technology (Part B, Section IV.D (2)(d)(i) and (ii)).

- ◆ Regulation No. 6 implements the federal standards of performance for new stationary sources. This maintenance plans makes no changes to this regulation. This reference to Regulation No. 6 shall not be construed to mean that these regulations are included in the SIP.

- ◆ The Common Provisions Regulation contains general provision applicable to all emission sources in Colorado. This maintenance plans makes no changes to this regulation.

The emission inventories for stationary sources supporting the maintenance demonstration have followed all relevant EPA rules and guidance documents for calculating such emissions. Further information, including individual emissions calculations for major stationary sources, is contained in the Technical Support Document accompanying this maintenance plan.

In accordance with State and federal regulations and policies, the State and federal nonattainment NSR requirements will revert to the State and federal attainment PSD permitting requirements once EPA approves this redesignation request and maintenance plan. This program requires the application of Best Available Control Technology when constructing new or modified major stationary sources.

2. Control Measures Removed from the State Implementation Plan

In its 1997 approval of the PM-10 SIP, EPA approved several control measures that are no longer necessary in the SIP in order to demonstrate continued maintenance of the standard. The State of Colorado requests removal of the following measures from the SIP as part of this maintenance plan:

a. Diesel Inspection/Maintenance Program

Regulation No. 12, concerning the reduction of diesel vehicle emissions, is hereby removed from the SIP. Since the current diesel inspection/maintenance program would receive only a small emission reduction benefit in the current SIP modeling, no credit is taken for this strategy in the emission inventory calculations and maintenance demonstration.

b. Oxygenated Gasoline Program

Regulation No. 13, concerning the oxygenated gasoline program, is hereby removed from the PM₁₀ SIP element. Since oxygenated gasoline results in only a small reduction in direct PM-10 emissions, no credit is taken for this strategy in the emission inventory calculations and maintenance demonstration. Regulation No. 13 remains part of the carbon monoxide maintenance plan.

c. Individual Stationary Source Permits

In its 1997 approval of the PM-10 SIP, EPA incorporated by reference several permits for individual stationary sources (40 CFR 52.320(c)(61)(i)(D) and (E), and 52.320(82)(i)). This maintenance plan hereby removes all of these referenced permits from the SIP: Public Service Company Cherokee station, Purina Mills, Electron Corp., Trigen-Colorado Energy Corp., Rocky Mountain Bottle Co., and Conoco refinery. The State of Colorado has determined they do not need to be incorporated in the SIP since no credit for permit limits is taken in the plan's maintenance demonstration. Permit limits are contained in underlying regulations or these sources are modeled at their maximum potential to emit.

B. Emission Inventories

This section presents emission inventories for the maintenance plan. Emission inventories are provided for the 1995 attainment year, the 2002, 2003, 2005 and 2010 interim years, and the 2015 maintenance year.

The 1995 inventory incorporates the projected emissions and control measures in place at that time (as documented in the February 1995 edition of the Denver PM-10 nonattainment SIP Element). The 2002, 2003, 2005, 2010 and 2015 inventories incorporate the maintenance plan control measures described above and projections of future emission levels from all sources.

All of the inventories are for the “modeling domain” of the Denver attainment maintenance area (see Figure 4-1) and provide emissions estimates for an average winter weekday after a snow event. Because of technical modeling limitations, the modeling domain is smaller than the attainment/maintenance area, though it includes all areas of expected maximum PM-10 concentrations. The modeling domain is also used to establish the motor vehicle emissions budgets for the region as discussed in subsequent sections of this plan.

All of the inventories were developed using EPA-approved emissions modeling methods and updated transportation and demographics data from DRCOG. The PM₁₀ maintenance plan technical support document contains detailed information on model assumptions and parameters for each source category.

The emissions inventories include forecasted estimates from Denver International Airport (DIA) operations and construction. The Technical Support Document contains a table of DIA emissions for purposes of general conformity demonstrations.

1. Demographic and Transportation Data

The emission estimates were updated based on the most recent demographic and VMT estimates contained in DRCOG’s conformity analysis for the updated fiscally constrained element of the Fiscally-Constrained 2020 Regional Transportation Plan (November 2000). These data are summarized in the following table:

Table 4-1: Demographic and Transportation Data
PM-10 Modeling Domain

	1995	2002	2005	2010	2015
Population	1,663,791	1,992,128	2,115,292	2,273,835	2,422,561
Households	693,688	836,158	890,629	961,692	1,031,744
Employment	1,005,129	1,180,036	1,285,223	1,420,487	1,504,693
Daily VMT	37,220,631	51,043,670	55,137,245	62,712,672	66,493,588

2. Emissions Inventory Data

The detailed emissions inventories for 1995, 2002, 2003, 2005, 2010 and 2015 are presented in Table 4.2.

C. Maintenance Demonstration

As required by CAA Section 175A(a), each request for redesignation shall be accompanied by a SIP revision which provides for maintenance of the NAAQS for at least 10 years after redesignation. EPA guidance and policy requires the same level of modeling for maintenance plans as that which was performed for the attainment demonstration (September 4, 1992 EPA memorandum from John Calcagni to EPA regional offices). Therefore, this maintenance demonstration is made through the use of area-wide dispersion and roll-forward modeling for the years 2002, 2003, 2005, 2010 and 2015, consistent with the modeling protocol approved for the 1995 attainment SIP (approved in 1997).

The modeling process includes dispersion modeling over five years of meteorological data (1985-89) with a regional air model (RAM) for primary PM₁₀ area, mobile and minor point sources, and an industrial source complex (ISC) model for primary PM₁₀ from major point sources modeled at allowable emissions levels. Future secondary particulate concentrations are based on a baseline (1989) secondary concentration determined from Chemical Mass Balance analysis and the change in total NO_x and SO₂ emissions from baseline to future years. A background component is also included based on five years of monitoring data from Estes Park and Limon and five years of meteorological data from Stapleton Airport.

Since the modeling process is based on five years of meteorological data, the highest 6th highest value from all receptors is used to determine if the standard has been met. The combined result of the dispersion models, roll-forward model and background for 2002 shows the highest 24-hour 6th maximum PM₁₀ concentrations at a receptor just north of the Cherokee Electrical Generating Station in Adams County. For 2003, 2005, 2010 and 2015, the modeling shows highest 24-hour 6th maximum PM₁₀ concentrations at the CAMP (20th & Broadway) monitor. The table below demonstrates maintenance of the standard during the entire period of the maintenance plan from 2002 through 2015.

Figure 4.1: PM-10 Modeling Domain

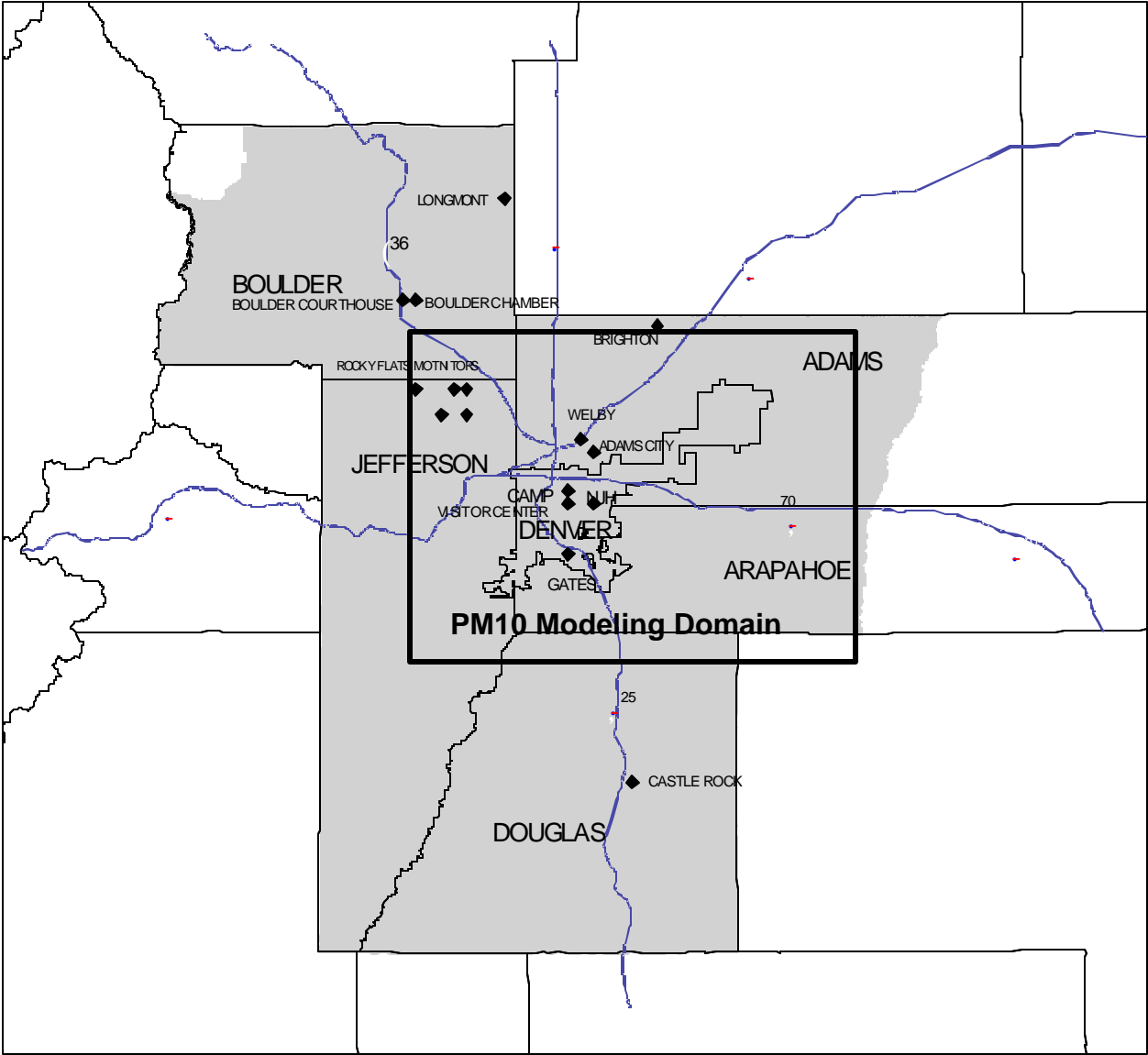


TABLE 4.2: PRIMARY AND SECONDARY EMISSIONS INVENTORY

PRIMARY PM₁₀ Source Category	1995 attain.* (tpwd)	2002 maint. (tpwd)	2003 maint. (tpwd)	2005 maint. (tpwd)	2010 maint. tpwd	2015 maint. tpwd
NATURAL GAS	1.0	1.2	1.2	1.3	1.4	1.5
WOODSTOVE	1.7	1.9	1.9	2.0	2.2	2.3
FIREPLACE	2.4	1.6	1.6	1.3	1.0	0.7
AIRPORT	0.6	0.6	0.6	0.6	0.7	0.7
RAILROAD	0.1	0.1	0.1	0.1	0.1	0.1
INDUSTRIAL EQUIPMENT	0.1	0.1	0.1	0.1	0.1	0.1
CONSTRUCTION EQUIPMENT	0.4	0.3	0.3	0.2	0.3	0.3
WIND EROSION	0.0	0.0	0.0	0.0	0.0	0.0
IRRIGATED WIND EROSION	0.0	0.0	0.0	0.0	0.0	0.0
DRYLAND TILLING	0.0	0.0	0.0	0.0	0.0	0.0
CONSTRUCTION	2.9	4.0	4.0	4.1	3.9	3.7
UNPAVED ROAD	7.9	6.9	6.9	6.9	6.9	6.9
ON-ROAD (exh/sand/dust)	41.2	42.3	43.3	44.8	48.5	51.1
CHARBROILERS	1.0	1.2	1.2	1.3	1.4	1.5
POINT SOURCE (minor)	5.8	7.6	7.9	8.2	8.8	9.4
POINT SOURCE (major)**	1.9	18.5	17.3	17.3	17.3	17.3
TOTAL PRIMARY PM₁₀	66.9	86.3	86.5	88.1	92.5	95.6
NO_x Source Category	1995 tpwd	2002 tpwd	2003 tpwd	2005 tpwd	2010 tpwd	2015 tpwd
POINT SOURCES***	137.8	151.2	133.9	128.8	130.4	132.2
NATURAL GAS	32.7	38.9	39.9	41.9	45.8	48.8
WOOD BURNING	0.5	0.6	0.6	0.7	0.9	1.0
AIRPORT NO _x	11.4	13.7	13.9	16.8	20.6	24.2
OTHER NON-ROAD	10.9	11.2	11.1	10.9	9.7	9.2
MOBILE EXHAUST	119.4	137.7	130.4	109.6	104.0	87.8
TOTAL NO_x	312.7	353.3	329.8	308.8	311.3	303.3
SO₂ Source Category	1995 tpwd	2002 tpwd	2003 tpwd	2005 tpwd	2010 tpwd	2015 tpwd
POINT SOURCES***	175.5	200.2	180.5	181.1	182.0	183.1
NATURAL GAS	0.2	0.2	0.2	0.3	0.3	0.3
WOOD BURNING	0.0	0.1	0.1	0.1	0.1	0.1
AIRPORT	1.0	1.1	1.2	1.2	1.3	1.4
OTHER NON-ROAD	0.9	1.2	1.3	1.3	1.5	1.7
MOBILE EXHAUST	2.5	5.6	5.8	6.1	2.1	2.2
TOTAL SO₂	180.1	208.4	189.1	190.0	187.3	188.8

* From original attainment SIP.

** In the original SIP, five sources were considered to be major sources and the maximum allowable emissions calculation was based on the maximum operating rates with existing control equipment. In this maintenance plan, these sources are modeled at their allowable emission rates according to regulation or permit, resulting in much higher potential emissions.

*** Based on Title V permit applications, many point sources have higher operating design rates than those included in the original rates, resulting in higher potential emissions. Actual emissions of NO_x and SO₂ will be much lower in future years.

Table 4.3: Maintenance Demonstration

Standard = 150 ug/m³

Year	Receptor	Julian Day	Total Concentration ug/m ³	Area/Mobile/ Minor Pt. Src. (RAM) ug/m ³	Major Point Source (ISC) ug/m ³	Secondary Roll-Forward ug/m ³	Background ug/m ³
2002	973	88340	148.6	80.9	0.64	52.6	14.4
2003	CAMP	85007	144.9	81.1	0.01	48.4	15.4
2005	CAMP	87327	140.3	75.7	0.32	46.6	17.7
2010	CAMP	87327	145.2	80.5	0.32	46.6	17.7
2015	CAMP	87327	148.8	84.7	0.32	46.1	17.7

The technical support document for this maintenance plan describes in detail the assumptions and methodologies used for all modeling work.

D. PM-10 and NOx Motor Vehicle Emissions Budgets

1. Requirements for Establishing Emission Budgets

The transportation conformity provisions of section 176(c)(2)(A) of the CAA require regional transportation plans and programs to show that "...emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan..."

EPA's transportation conformity regulation (40 CFR 93.118, August 15, 1997) also requires that motor vehicle emission budget(s) must be established for the last year of the maintenance plan, and may be established for any other years deemed appropriate. If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are no factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan." The normal interagency consultation process required by the regulation shall determine what must be considered in order to make such a finding.

For transportation plan analysis years after the last year of the maintenance plan (in this case, 2015), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the maintenance plan.

2. Pollutants of Coverage

This maintenance plan establishes separate motor vehicle emission budgets for total primary PM-10 and NOx as a PM-10 precursor. Available information indicates that SO₂ emissions from mobile sources are an insignificant contributor to secondary particulate formation in the Denver area (much less than 1 ug/m³). Therefore, an emission budget for SO₂ is not established.

3. Geographic Area of Coverage

This maintenance plan establishes regional budgets for the PM-10 modeling domain, which for technical modeling reasons is less than the entire nonattainment area (See Figure 4.1 previously). All of the emission estimates and air quality modeling in the maintenance plan are based on this domain. Future conformity determinations shall also project future mobile source emission for this same domain, unless the geographic coverage of the budget is changed through a future SIP revision.

4. PM-10 and NOx Budgets

As shown in the maintenance demonstration earlier in this plan, the 2002, 2003, 2005, 2010 and 2015 regional emissions inventories for primary PM-10 and PM-10 precursors are below the level necessary to demonstrate continued maintenance of the PM-10 standard (150 ug/m³). As a result, EPA’s conformity regulation (40 CFR 93.124) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. The implementation plan can then allocate some or all of this additional “safety margin” to the emissions budget(s) for conformity purposes.

This maintenance plan allocates the available “safety margin” as illustrated below:

Table 4.4: Allocation of Available Safety Margin in 2015

Standard = 150 ug/m³

Maximum Allowable Concentration	149.9 ug/m ³
Maintenance Demonstration - 2015 (Table 4.3)	148.8 ug/m ³
Available “safety margin” below standard	1.1 ug/m ³
Secondary Concentration (Table 4.3)	46.1 ug/m ³
Allowable Secondary Concentration	47.2 ug/m ³
Allowable NOx+SO2 Emissions**	505 tpd
2015 NOx+SO2 Emissions (Table 4.2)	492 tpd
Available “safety margin” for NOx emissions	13 tpd
Motor vehicle NOx emissions in 2015 (Table 4.2)	88 tpd
NOx emissions budget	101 tpd

**PM-10 emissions kept constant. 10.7 tpd of NOx equals 1 ug/m³

The budget allocates the entire “safety margin” to the NOx budget while keeping the PM-10 budget the same as the level of PM-10 emissions in the maintenance demonstration. It is generally believed that NOx is more difficult for local control measures, while PM-10 can be reduced more readily through the local conformity commitment process. In addition, estimates of future NOx emissions from new mobile source emission models are more uncertain at this time.

Therefore, this maintenance plan establishes emission budgets in the maintenance year and beyond as follows:

Table 4.5: Motor Vehicle Emissions Budgets for PM-10 and NOx

	PM-10 (tpd)	NOx (tpd)
2015 and beyond	51	101

For transportation plan analysis years prior to the last year of the maintenance plan, consistent with EPA’s conformity regulation, conformity findings prepared by DRCOG will need to make a qualitative finding that there are no factors which would cause or contribute to a new violation or exacerbate an existing violation. The region’s established interagency conformity consultation process shall determine what must be considered in order to make such a finding.

Consistent with EPA’s conformity regulation, this maintenance plan deletes the existing SIP requirement for dispersion modeling as part of future regional conformity determinations. Consistency with the emission budgets is the only federal requirement.

5. Construction-Related Emissions

EPA’s transportation conformity regulation 40 CFR 93.122(d) requires all PM-10 nonattainment and maintenance areas to include highway and transit construction-related PM-10 emissions in their regional conformity analysis if their PM-10 SIP identifies construction as a contributor to the PM-10 problem. The regulation does not require areas to specifically identify highway and transit project construction as a source of PM-10 in the SIP.

This maintenance plan includes PM-10 emission estimates for construction activities in general. All types of construction, including highway and transit construction, are assumed to be included in this analysis.

The construction emissions inventory in this maintenance plan was developed using the same economic activity factors that DRCOG used to develop its most recent 2020 Transportation Plan and 2001-2006 TIP, upon which this maintenance plan is also based. Therefore, the 2020 Transportation Plan and the current and subsequent TIPs are presumed to be consistent with this maintenance plan for purposes of considering PM₁₀ construction-related emissions in future conformity determinations. Thus, the construction-related emissions from the 2020 Transportation Plan and current and subsequent TIPs are accounted for in the maintenance demonstration, as are any new or revised transportation plans or improvement programs with construction-related emissions equal to, or less than, the construction-related emissions from the 2020 Transportation Plan and 2001-2006 TIP.

DRCOG may presume that any future plan or program, or amendment to a plan or program, will have construction-related emissions less than, or equal to, the 2020 Transportation Plan and 2001-2006 TIP if the number of lane miles to be constructed, on an annualized basis, in such new or amended plan or program are less than or equal to the maximum number of lane-miles to be constructed, on an annualized basis, pursuant to the 2020 Transportation Plan and 2001-2006 TIP. For purposes of making this determination, the term "lane-miles" shall mean one mile of a transit line or one mile of a lane on a roadway on the regional plan. If the number of lane miles to be constructed in a new or amended plan or program exceed the number of lane miles to be constructed pursuant to the 2020 Transportation Plan and 2001-2006 TIP, the existing interagency consultation process will be used to determine how the additional construction-related emissions, if any, will be analyzed or mitigated for purposes of the regional emissions analysis.

E. Monitoring Network / Verification of Continued Attainment

Once the Denver metropolitan area has been redesignated to attainment status by EPA, the APCD will continue to operate an appropriate air quality monitoring network of NAMS and SLAMS monitors in accordance with 40 CFR Part 58 to verify the continued attainment of the PM-10 NAAQS. Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

The State will also track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the APCD will perform the appropriate studies to determine 1) whether additional and/or re-sited monitors are necessary and 2) whether mobile and stationary source emission projections are on target.

F. Contingency Provisions

Section 175A(d) of the CAA requires that the maintenance plan contain contingency provisions to assure that the State will promptly correct any violation of the PM-10 NAAQS standard which occurs after redesignation to attainment. Attainment areas are not required to have preselected contingency measures, just a list of measures that could be considered for future implementation.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once the need is triggered. The primary elements of the contingency plan are:

1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

The triggering of the contingency plan does not automatically require a revision of the SIP, nor is the area necessarily redesignated once again to nonattainment. Instead, the State will normally have an appropriate amount of time to correct the violation by implementing one or more contingency measures as necessary. In the event that violations continue to occur after

contingency measures have been implemented, additional contingency measures will be implemented until the violations are corrected.

1. Potential Contingency Measures

Section 175A(d) of the CAA requires the Maintenance Plan to include as potential contingency measures all of the control measures contained in the SIP before redesignation which were relaxed or modified through the Maintenance Plan. For the Denver metropolitan area, this includes :

- S Repeal sections IV.A.2, IV.B.3, IV.D, IV.D.1, IV.D.2, IV.D.3 and IV.D.4 of Regulation No. 11, Part A, which provisions were adopted by the AQCC on January 10, 2000 as part of the Carbon Monoxide Maintenance Plan. Such provisions amended the automobile inspection and readjustment program to add a clean screen program based on remote sensing.
- S Regulation No. 12 concerning the diesel inspection/maintenance program.
- S Regulation No. 13 concerning the oxygenated gasoline program.
- S Permit terms and limits that were included in stationary source permits previously incorporated into the state implementation plan at 40 CFR 52.320(82); 62 FR 18716 (April 17, 1997).

In addition to these potential contingency measures, the State may evaluate other potential strategies in order to address any future violations in the most appropriate and cost-effective manner possible. Other potential measures include, but are not limited to:

- ◆ Increased street sweeping requirements
- ◆ Expanded, mandatory use of alternative de-icers
- ◆ More stringent street sand specifications
- ◆ Road paving requirements
- ◆ Further woodburning restrictions
- ◆ Re-establishing new source review permitting requirements for stationary sources
- ◆ NOx RACT for stationary sources
- ◆ Transportation control measures designed to reduce vehicle miles traveled
- ◆ Improved diesel inspection/maintenance Program
- ◆ Retrofit program for heavy-duty diesel truck engines
- ◆ Other emission control measures appropriate for the area based on the consideration of cost-effectiveness, PM₁₀ emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

2. Tracking and Triggering Mechanisms

a. Tracking

The primary tracking plan for the Denver metropolitan area consists of continuous PM-10 monitoring by APCD as described above. APCD will notify EPA, the AQCC, the RAQC, and local governments in the Denver area of any exceedance of the 24-hour NAAQS within 45 days of occurrence.

The ongoing regional transportation planning process carried out by the Denver Regional Council of Governments, in coordination with the RAQC, APCD, AQCC, and EPA, will serve as another means of tracking mobile source PM-10 and NOx precursor emissions into the future.

Since revisions to the region's transportation improvement programs are prepared every two years, and must go through a transportation conformity finding, this process will be used to periodically review progress toward meeting the VMT and mobile source emissions projections in this maintenance plan.

b. Triggering Contingency Measures

An exceedance of the 24-hour PM-10 NAAQS may trigger a voluntary, local process by the RAQC and APCD to identify and evaluate potential contingency measures. However, the only federally-enforceable trigger for mandatory implementation of contingency measures shall be a violation of the NAAQS. Specifically, the three-year average of expected exceedances at a monitoring site would have to be greater than 1.0 for a violation to occur.

3. Process for Recommending and Implementing Contingency Measures

The State will move forward with mandatory implementation of contingency measures under the SIP if a violation of the PM-10 NAAQS occurs.

No more than 60 days after being notified by the APCD that a violation of the 24-hour PM-10 NAAQS has occurred, the RAQC, in coordination with the APCD and AQCC, will initiate a subcommittee process to begin evaluating potential contingency measures. The subcommittee will present recommendations to the RAQC within 120 days of notification and the RAQC will present recommended contingency measures to the AQCC within 180 days of notification.

The AQCC will then hold a public hearing to consider the contingency measures recommended by the RAQC, along with any other contingency measures the Commission believes may be appropriate to effectively address the violation. The necessary contingency measures will be adopted and implemented within one year after a violation occurs.

G. Subsequent Maintenance Plan Revisions

Since EPA's new emissions model, MOBILE6, was not available for use in this maintenance plan, credit for the Tier II/gasoline sulfur standards is based on inventory adjustment factors to MOBILE5 supplied by EPA. Colorado commits to revise the maintenance plan under the one-year option described in the supplemental notice of proposed rule at 65 FR 46383 (July 28, 2000) and within twelve months of the later of the official release of: (1) MOBILE6, (2) the MOBILE6 particulate emissions replacement for PART5 (MOBILE6.1), or (3) the MOBILE6 guidance to enable Colorado to model its vehicle inspection/maintenance program for the model years after 1995.

As stated earlier, it is required that a maintenance plan revision be submitted to the EPA eight years after the original redesignation request/maintenance plan is approved - the purpose of this revision is to provide for maintenance of the NAAQS for an additional ten years following the first ten-year period. The State of Colorado commits to submit a revised maintenance plan eight years after redesignation to attainment, as required by the CAA.

H. Nonseverability and Waiver

Unless waived by the Colorado Department of Public Health and Environment, the provisions of this maintenance plan shall be nonseverable. If the redesignation of the Denver PM₁₀ nonattainment area as an attainment area or any provisions of this maintenance plan are disapproved by EPA or otherwise ruled invalid, such disapproval or invalidity shall apply to this maintenance plan in its entirety. The Colorado Department of Public Health and Environment may, however, waive this nonseverability clause.