



MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101 • www.mde.state.md.us

Martin O'Malley
Governor

Robert M. Summers, Ph. D.
Secretary

Anthony G. Brown
Lieutenant Governor

***Baltimore Nonattainment Area
PM_{2.5}
Redesignation Request***

SIP Number: 13-10

May 28, 2013

Prepared for:

U.S. Environmental Protection Agency

Prepared by:

Maryland Department of the Environment



This Page Left Intentionally Blank

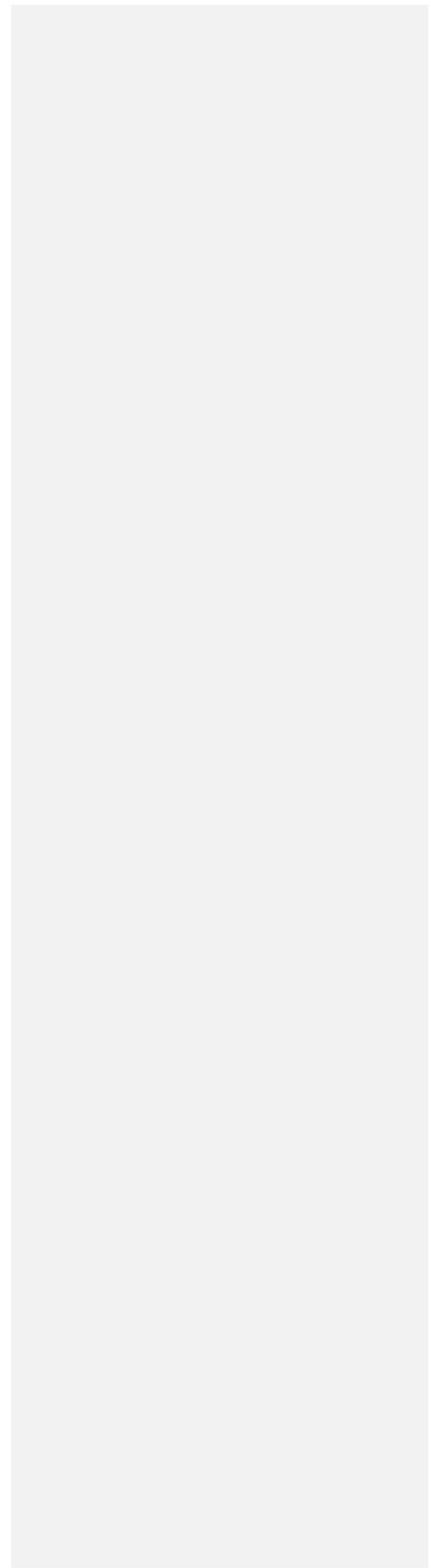


Table of Contents

1. Introduction.....	1
2. Background.....	1
2.1 Health Effects.....	1
2.2 Baltimore, MD Nonattainment Designation.....	2
3. USEPA Requirements for Redesignation.....	4
3.1 Attainment of the Standard.....	4
3.1.1 PM _{2.5} Monitoring Data Analysis Requirements.....	5
3.1.2 Baltimore Area PM _{2.5} Ambient Air Monitoring Network.....	5
3.1.3 Baltimore Area PM _{2.5} Annual Concentration Data.....	6
3.1.4 Missing Data under the 1997 Annual PM _{2.5} Standard.....	9
3.1.5 Quality Assurance.....	10
3.1.6 Continued Monitoring Commitment.....	10
3.1.7 Clean Data Determination.....	10
3.2 Implementation Plan Approval.....	11
3.3 Permanent and Enforceable Emission Reductions.....	11
3.3.1 On-Road Emission Reduction Requirements.....	11
3.4 Maintenance Plan.....	13
3.5 Section 110 and Part D Requirements.....	14
3.5.1 Demonstration of Compliance.....	14

List of Figures

Figure 2-1: Baltimore, MD PM _{2.5} NAAQS Nonattainment Area.....	3
Figure 3-1: Baltimore, MD Nonattainment Area PM _{2.5} Monitoring Sites.....	6
Figure 3-2: Baltimore Area Annual PM _{2.5} Data Trends.....	9

List of Tables

Table 2-1: Baltimore, MD Nonattainment Area with FIPS Codes.....	2
Table 3-1: Baltimore, MD Annual PM _{2.5} Design Values.....	8
Table 3-2: On-Road Emission Reductions for the Baltimore Area, 2002-2007.....	13
Table 3-3: Infrastructure Submittals for Maryland.....	15

Mary Jane Rutko..., 11/22/2013 12:16 PM

Deleted: [1 - Introduction](#) . 1 .

... [1]

Mary Jane Rutko..., 11/22/2013 11:25 AM

Deleted: 9

Mary Jane Rutko..., 11/22/2013 11:25 AM

Deleted: 13

Mary Jane Rutko..., 11/22/2013 11:25 AM

Deleted: 15

Mary Jane Rutko..., 11/22/2013 12:18 PM

Deleted: Preliminary DRAFT of the

This Page Left Intentionally Blank

1. Introduction

The State of Maryland requests that the United States Environmental Protection Agency (USEPA) redesignate the Baltimore, MD 1997 fine particulate (PM_{2.5}) nonattainment area to attainment for this standard pursuant to the provisions under § 107 of the federal Clean Air Act (CAA). Since the designations for the National Ambient Air Quality Standards (NAAQS) for this pollutant were published (Federal Register, Vol. 70, No. 3, 1/5/2005), the area's PM_{2.5} air quality has improved due to permanent and enforceable emission reductions. Air quality in the area is significantly better than required by this standard. Due to the improvement in PM_{2.5} air quality, the USEPA finalized a clean data determination for the Baltimore area on May 22, 2012 (Federal Register, Vol. 77, No. 99, 5/22/2012). The State of Maryland is also requesting that USEPA concurrently approve, as a revision to the state implementation plan (SIP), the related § 175A maintenance plan. This plan ensures that good PM_{2.5} air quality will be maintained through 2025.

2. Background

2.1 Health Effects

PM_{2.5}, also known as fine particulate matter or fine particles, is defined as any airborne particle of solid or liquid matter that is less than or equal to 2.5 micrometers in diameter. PM_{2.5} is not a single pollutant but a sum of all pollutants that have diameters less than 2.5 micrometers, which is 1/30th the diameter of a human hair.

Sources of PM_{2.5} and PM_{2.5} precursors include, most significantly, coal-fired power plants and other combustion sources, fires, emissions from motor vehicles, windblown dust, and natural emissions from trees and the oceans. These sources can be divided up into two types of sources, primary and secondary. Primary sources directly emit fine particulate matter into the atmosphere without any chemical change occurring to the pollutant. Secondary sources are sources from which precursor chemical species are released into the atmosphere and then react with other chemical species in the atmosphere to create fine particulate matter. Some species which comprise fine particulate matter are sulfates, ammonium nitrate, soot, sea salt, organic carbon, and metals (crustal metals, transitional metals, and potassium).

Exposure to high levels of PM_{2.5} adversely affects human health. The main impacts of PM_{2.5} on human health are on the respiratory system and the cardiovascular system. Children, the elderly, and individuals with pre-existing pulmonary or cardiac disease are the most susceptible to PM_{2.5} pollution. Complications that can arise from exposure to elevated levels of PM_{2.5} include decreased lung function, chronic bronchitis, respiratory symptoms such as asthma attacks and difficulty breathing, nonfatal heart attacks, irregular heartbeat, and premature death in individuals with pulmonary or cardiac disease.

2.2 Baltimore, MD Nonattainment Designation

The CAA requires each state with areas failing to meet the 1997 PM_{2.5} NAAQS to develop SIPs to expeditiously attain and maintain the standards. The USEPA revised the NAAQS for particulate matter in July 1997 (Federal Register, Vol. 62, No. 138, 7/18/1997). The USEPA issued a new primary (health-based) PM_{2.5} standard and retained the primary PM₁₀ standard. The standards include an annual standard set at 15.0 micrograms per cubic meter (µg/m³), based on the 3-year average of annual mean PM_{2.5} concentrations, and a 24-hour standard of 65 µg/m³, based on the 3-year average of the 98th percentile of 24-hour concentrations.

On December 17, 2004, the USEPA administrator signed the final rule regarding the initial PM_{2.5} nonattainment areas designations for the PM_{2.5} standards across the country. The final rule became effective on April 5, 2005 (Federal Register, Vol. 70, No. 3, 1/5/2005). The Baltimore, MD area was originally designated nonattainment for the 1997 PM_{2.5} NAAQS based on air quality data showing that the area did not meet the 15.0 µg/m³ annual standard. Unlike Subpart 2 of the CAA that defined five ozone nonattainment classifications for the areas that exceed the NAAQS based on the severity of the ozone levels, PM_{2.5} nonattainment designations are simply labeled “nonattainment”. The CAA required states with PM_{2.5} nonattainment areas to submit an attainment plan within three years of the effective date of the designations (April 5, 2008) detailing how the PM_{2.5} standards will be attained by April 5, 2010. The attainment plans were submitted in a timely manner.

The area designated nonattainment for the 1997 PM_{2.5} NAAQS is defined in [Table 2-1](#) and depicted in Figure 2-1.

Table 2-1: Baltimore, MD Nonattainment Area with FIPS Codes

Baltimore, MD PM_{2.5} Nonattainment Jurisdictions

Anne Arundel County (24-003)
Baltimore County (24-005)
Carroll County (24-013)
Harford County (24-025)
Howard County (24-027)
Baltimore City (24-510)

Mary Jane Rutko..., 11/22/2013 10:30 AM

Deleted: replaced the existing PM₁₀ standard¹ with

Mary Jane Rutko..., 11/22/2013 10:32 AM

Deleted: as a particulate standard protecting welfare.

Mary Jane Rutko..., 11/22/2013 11:24 AM

Deleted: Table 2-1

Mary Jane Rutkowski 4/29/2015 3:31 PM

Formatted: Font:12 pt