

## **9.0 Contingency Measures**

All PM<sub>2.5</sub> nonattainment area SIPs must include contingency measures consistent with CAA Section 172(c)(9). Contingency measures are additional control measures to be implemented in the event that an area fails to either meet reasonable further progress<sup>1</sup> (RFP) requirements or attain the standards by the required attainment date.

Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date. The SIP should contain trigger mechanisms and a schedule for contingency measure implementation, as well as indicate that implementation will not rely on any further action by the State or EPA. States may also use as contingency measures one or more Federal or local measures that are already in place and provide reductions that are in excess of the reductions required by the attainment demonstration or RFP plan.

The PM<sub>2.5</sub> Implementation Rule also specifies that a contingency plan should “provide for emission reductions equivalent to about one year of reductions needed for RFP, based on the overall level of reductions needed to demonstrate attainment divided by the number of years from the 2002 base year to the attainment year.”<sup>2</sup>

This chapter quantifies the level of emission reductions required by the PM<sub>2.5</sub> Implementation Rule for Connecticut’s contingency plan and demonstrates that projected emission reductions are sufficient to comply with the requirement.

### **9.1 Quantification of Contingency Reductions Required in Connecticut**

The PM<sub>2.5</sub> Implementation Rule requires that the quantity of emission reductions needed to satisfy contingency requirements is an amount about equal to one year’s worth of required reductions, where “required reductions” are the amount of reductions needed to attain compliance with the PM<sub>2.5</sub> NAAQS. Required reductions are calculated for Connecticut as the difference between the 2002 base year emissions and the CMAQ modeled 2009 emissions. Since there are seven years between 2002 and 2009, the total quantity of reductions required for attainment is divided by seven to determine a single year’s worth of required reductions (i.e., the contingency requirement).

#### **9.1.1 CMAQ Modeled 2009 Emissions and Attainment Targets**

Modeling and weight-of-evidence analyses presented in Chapter 8 allow for the conclusion that attainment will be achieved throughout the NY-NJ-CT PM<sub>2.5</sub> nonattainment area by the April 2010 deadline. Table 9-1 compares the MANE-VU 2009 projected emission levels (*i.e.*, the attainment targets) to estimated levels for the 2002 base year for the Connecticut portion of the nonattainment area, consisting of Fairfield and New Haven Counties. Table 9-1 also identifies Connecticut’s calculated contingency targets, which are 1/7 of the difference between the 2002 and 2009 emission levels. The resulting contingency measure emission reduction targets are 2,876 tons/year of NO<sub>x</sub> emissions and 778 tons/year of SO<sub>2</sub> emissions. Since PM<sub>2.5</sub> primary

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<sup>1</sup> 72 FR 20633 (April 25, 2007). Nonattainment areas that demonstrate attainment by 2010 will be considered to have satisfied the RFP requirement.

<sup>2</sup> 72 FR 20643.

emissions increase slightly from 2002 to 2009, no contingency can be calculated for that pollutant.

**Table 9-1. Calculation of Connecticut's Contingency Measure Emission Reduction Targets (Tons)**

Year	Geographic Area	NO <sub>x</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>
2002 Base Year	Fairfield and New Haven counties	61354	5925	18479
2009 Attainment Targets	Fairfield and New Haven counties	41220	5990	13033
(2002-2009)/ 7 Contingency Reduction Targets	Fairfield and New Haven counties	2876	0*	778

\* PM<sub>2.5</sub> increases slightly between 2002 and 2009; therefore no contingency is required for PM<sub>2.5</sub>.

### 9.1.2 Connecticut's Contingency Measures Plan

Section 179(c)(1) of the CAA requires the EPA Administrator to determine, within six months of the required attainment date, whether each nonattainment area has attained the NAAQS by the attainment deadline. Such determination must be published in the Federal Register. CAA Section 179(d)(1) specifies that those areas found not to attain by the required attainment date be provided one year from the Federal Register notice to submit a revised SIP describing how and when the area will achieve attainment.

As the required attainment date for the NY-NJ-CT PM<sub>2.5</sub> nonattainment area is April 5, 2010, the EPA Administrator has until October 5, 2010 to analyze air quality data and determine whether the area attained the PM<sub>2.5</sub> NAAQS; such a finding is published in the Federal Register. Assuming EPA adheres to this schedule, areas identified as not attaining the NAAQS will be required to begin implementation of their contingency measure plans upon EPA's publication of a Federal Register notice in October 2010. The emission reductions realized by the contingency plan will ensure continued progress toward attainment during the one-year period (i.e., until October 2011) in which the CAA allows states to prepare revised SIPs providing for expeditious attainment.

If EPA determines the NY-NJ-CT nonattainment area has not attained the PM<sub>2.5</sub> NAAQS, Connecticut's contingency plan consists of previously adopted measures that will continue to provide an increasing level of emission reductions in 2010 and 2011, while Connecticut is preparing a revised attainment demonstration SIP. The previously adopted measures include federal emission standards and fuel sulfur standards for both on-road and non-road vehicles and engines.

For on-road vehicles, EPA's Tier 2 emission standards for new light-duty vehicles and gasoline sulfur levels are being phased-in over vehicle model years 2004 through 2009. For on-road vehicles equipped with heavy-duty engines, EPA's 2007 Heavy Duty Highway Rule implements

more stringent new engine and diesel fuel sulfur standards beginning in 2006. For non-road mobile source engines, EPA's most recently promulgated diesel engine standards (i.e., Tier 4) will be phased-in for new engines over the 2008 to 2015 period, along with phased-in diesel fuel sulfur requirements (i.e., 500 ppm in 2007 and 15 ppm in 2010). EPA also has adopted tighter standards for variety of new non-road gasoline engines that are being phased-in over a range of years. *See* Chapter 4 for a more complete discussion of these federal requirements for on-road and non-road engines.

The combination of phased-in standards and gradual fleet turnover as consumers replace older vehicles and non-road equipment with new purchases results in continued reductions in emissions of PM<sub>2.5</sub> and NO<sub>x</sub> from the mobile source sector through 2011 and beyond.

Table 9-2 summarizes the calculations necessary to determine whether total projected emissions reductions between 2009 and 2011 are sufficient to meet the contingency reduction targets determined previously in Table 9-1. Projected 2011 emissions for Connecticut's portion of the NY-NJ-CT nonattainment area were determined by linear interpolation between emission estimates for 2009 and 2012. Resulting emission estimates for 2011 were subtracted from 2009 emission levels to identify the projected emission reductions available to satisfy the contingency requirement (i.e., 3673 tons of NO<sub>x</sub>, 131 tons of PM<sub>2.5</sub>, and 65 tons of SO<sub>2</sub>).

When projected reductions are compared to the contingency emission reduction targets for individual pollutants (i.e., 2876 tons of NO<sub>x</sub>, 0 tons for PM<sub>2.5</sub>, and 778 tons of SO<sub>2</sub>), there is a surplus of emission reductions projected for NO<sub>x</sub> and PM<sub>2.5</sub> and a deficit for SO<sub>2</sub>.<sup>3</sup> When summed across all three pollutants, the combined surplus of 217 tons is sufficient to satisfy the contingency requirement.

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<sup>3</sup> The "deficit" in SO<sub>2</sub> reductions available for contingency between 2009 and 2011 is largely the result of CT's implementation in 2003 of more stringent power plant sulfur limits which account for most of the 30% reduction in total SO<sub>2</sub> emissions between 2002 and 2009. Although Connecticut is not subject to the SO<sub>2</sub> requirements of the federally mandated CAIR program, the state's 2003 limits (0.3% sulfur) are at least as stringent as the CAIR program's limits and were implemented 7 years prior to the required CAIR implementation date of 2010. If Connecticut's 2003 emission limits were not implemented until 2010, there would no "deficit" of SO<sub>2</sub> reductions in the contingency measures calculation.

**Table 9-2. Comparison of Projected Emission Reductions to Required Contingency Reduction Targets for Connecticut's Portion of the NY-NJ-CT PM<sub>2.5</sub> Nonattainment Area (Tons)**

Year	NO <sub>x</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	
2009 Emissions	41220	5990	13033	
2012 Emissions	35711	5793	12936	
Interpolated 2011 Emissions (=2009-[(2009-2012)*2/3])	37547	5859	12968	
Emissions Reductions Available for Contingency Use (2009-2011)	3673	131	65	
Contingency Reduction Targets	2876	0	778	<b>Sum Across Pollutants</b>
<b>Contingency Reduction Surplus (Deficit)</b>	797	131	(711)	<b>217</b>

## 9.2 Contingency Measure Weight of Evidence Analysis

The CAA requirement to implement contingency measures in areas that fail to achieve timely attainment is intended to ensure continued PM<sub>2.5</sub> air quality improvements during the period that SIPs are being updated. EPA's PM<sub>2.5</sub> Implementation Rule attempts to accomplish that goal by requiring states to develop contingency plans based solely on emission reductions from local sources, as was done for Connecticut in the above calculations. However, as more fully discussed in the PM<sub>2.5</sub> conceptual description in Chapter 2 of this demonstration, elevated levels of PM<sub>2.5</sub> in the Northeast are caused by varying combinations of both local and regionally transported emissions. In summer, regional levels of sulfate often contribute 50% or more of total PM<sub>2.5</sub> concentrations during peak periods. Although peak periods of PM<sub>2.5</sub> in winter typically have a larger local emissions component than in summer, regionally transported contributions are still significant. Therefore, in addition to the benefits of local emission reductions, continued improvements in PM<sub>2.5</sub> air quality can be achieved through reductions in transported emissions from upwind areas.

As noted above, sulfates are the single greatest contributor to the regionally transported component of measured PM<sub>2.5</sub> concentrations. Power plants are the major emitters of SO<sub>2</sub> emissions, much of which is converted in the atmosphere to sulfates, especially during summer episodes when sulfates can make up the majority of measured PM<sub>2.5</sub> mass.

EPA's CAIR program is designed to reduce the level of transported sulfates caused by power plants, with Phase 1 of the program due to be implemented in 2010. EPA's CAIR modeling demonstrated that Connecticut is not a significant contributor to the sulfate component of PM<sub>2.5</sub> levels in any nonattainment state; therefore, Connecticut is not subject to the SO<sub>2</sub> provisions of CAIR. However, New York, New Jersey, Pennsylvania and 22 other states in the eastern U.S. are required to implement the CAIR program for SO<sub>2</sub>, which EPA estimates will provide a 44% reduction in power plant SO<sub>2</sub> emissions between 2003 and 2010 in covered states. When the CAIR reductions are considered in conjunction with the mounting reductions due to the federal

on-road and non-road engine standards and fuel requirements, significant improvements in transported levels of PM<sub>2.5</sub> can be expected between 2009 and 2011 and beyond. For example, discussions with New Jersey regarding their draft PM<sub>2.5</sub> SIP indicate that these measures will produce more than 6,600 tons/year of NO<sub>x</sub> reductions and 16,600 tons of SO<sub>2</sub> reductions in 2010, representing a 15% reduction compared to the total of NO<sub>x</sub> and SO<sub>2</sub> emissions in New Jersey in the attainment year of 2009. Similar levels of post-2009 reductions can be expected in other states upwind of Connecticut due to the CAIR and federal mobile source measures. As a result, significant improvements in transported levels of PM<sub>2.5</sub> can be anticipated after 2009 in Connecticut and throughout the Northeast, thus reinforcing the satisfaction of Connecticut's contingency requirements.