

Chapter 8

Looking Beyond Current Requirements

South Coast Air Quality Management District

Cleaning the air that we breathe...



CHAPTER 8

LOOKING BEYOND CURRENT REQUIREMENTS

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INTRODUCTION

This Chapter presents additional analyses which are not legally required, but are presented here for informational purposes to initiate stakeholder discussion on future air quality planning and to place the 2012 AQMP in context of long-range transformation needed for this region to meet the health-based air quality standards and provide cobenefits to GHG and air toxic reductions, energy security, and mobility.

POTENTIAL CHANGES IN THE FEDERAL OZONE STANDARD

The Clean Air Act (CAA) requires U.S. EPA to periodically review the existing air quality standards in light of the findings of new and emerging epidemiological and health studies. The CAA sets up a 5-year review cycle for the national ambient air quality standards. The current cycle for ozone began in 2008, and U.S. EPA will revisit the most recent standards in 2013. The Clean Air Scientific Advisory Committee (CASAC) has already begun a new and forthcoming scientific review in preparation of the 2013 review of the ozone standards and U.S. EPA expects to propose potential revisions to the ozone standard in the fall of 2013 and finalize any revisions to the standard in 2014. Based on the previous recommendations by CASAC and the previous reviews and proposals by U.S. EPA, it is anticipated that the 8-hour ozone standard may be lowered to a level between 0.060 ppm and 0.070 ppm (60 – 70 ppb). If finalized in 2014, designations would follow in 2015, and the new attainment date (for extreme non-attainment areas such as the Basin) would be in the 2035 time frame.

IMPLICATIONS OF A NEW OZONE STANDARD FOR THE BASIN

Based on the modeling results presented in Chapter 5 and Appendix V, the Basin can demonstrate attainment with the existing federal 8-hour ozone standards by the corresponding attainment deadlines (2023 and 2032) only by using a provision of the federal CAA Section 182(e)(5) that allows credit for emissions reductions from future improvements in control techniques and technologies. The projected ozone isopleths for the average 8-hour ozone design values at Crestline monitoring station are shown in Figure 8-1 for illustration purpose. The upper right corner represents the projected VOC and NO_x emissions inventory in 2023 with full implementation of all adopted control measures (baseline). Moving down and left on the figure corresponds to relative emissions reductions of NO_x (down) and VOC (left). The curved lines within the figure signify the projected 8-hour ozone design value resulting from those emissions reductions.

Figure 8-1 demonstrates that in order to meet the 80 ppb ozone level in 2023, an approximate 65% reduction (35% remaining) in NO_x emissions will be necessary beyond already adopted measures. VOC reductions are not as effective as NO_x reductions, but concurrent 60% VOC reductions would reduce the needed NO_x reductions to about 60%. Figure 8-1 also indicates that a 75% reduction in NO_x emissions is needed to meet the 75 ppb level in 2032. A full discussion of the emissions reductions needed to meet current ozone standards is included in Chapter 5 and Appendix V.

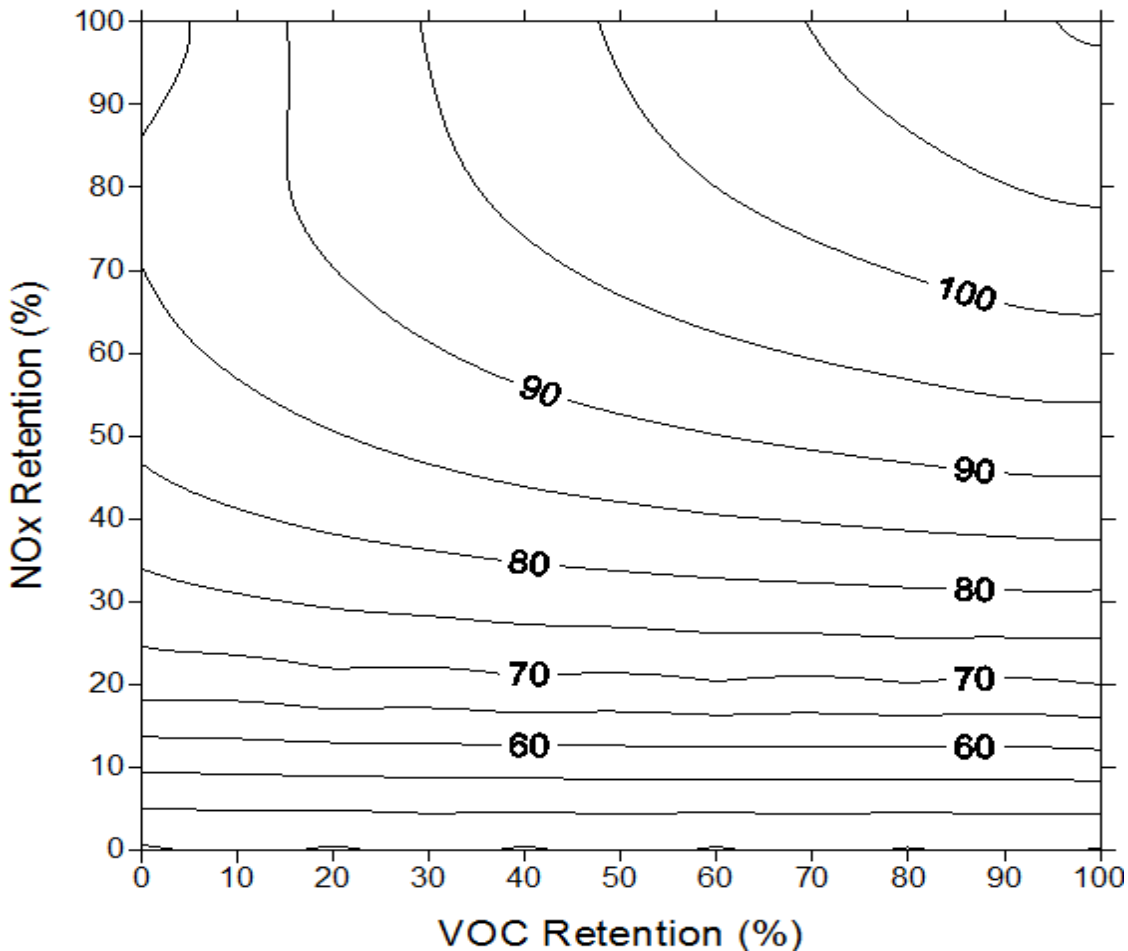


FIGURE 8-1
 2023 Preliminary 8-hour Average Ozone Basin Design Value Isopleths
 at Crestline Monitoring Station

As stated above, it is anticipated that the 8-hour ozone standard may be lowered to a level between 60 and 70 ppb. Therefore, in order to demonstrate attainment in the 2035

time frame, an additional 80% to 88% NO_x emissions reduction below 2023 baseline would be needed. Assuming the 75 ppb standard is met in 2032 with a 75% NO_x reduction below 2023 baseline helps to illustrate the significant difference between a new 60 ppb 8-hour ozone standard and a 70 ppb standard. A 70 ppb standard represents an approximate 20% NO_x reduction between 2032 and 2035, while a 60 ppb standard requires a 50% NO_x reduction in that three year time span. A standard at 60 ppb is also within 12 ppb of the Basin background level of ozone, which has been estimated to be about 48 ppb by modeling the Basin with all man-made sources removed. Figure 8-1 also demonstrates that the effectiveness of NO_x emission reductions continues to be most effective at these lower ozone levels. It would be the greatest air quality challenge the region has ever faced relative to achieving additional NO_x emission reductions necessary to demonstrate attainment with these potential new standards and would further necessitate transformational technologies with zero or near-zero combustion emissions.

1-HOUR OZONE REQUIREMENTS

The federal 1-hour ozone standard was revoked when the 8-hour standard was established. U.S. EPA guidance indicated that while certain planning requirements remained in effect, a new SIP would not be required if an area failed to attain the standard by the attainment date. However, a recent court decision has led U.S. EPA to propose an action requiring a new 1-hour ozone attainment demonstration for the South Coast Basin. The attainment demonstration would be due within 12 months of publication of the final action. The attainment demonstration would have to show attainment within 5 years with a potential 5-year extension, which would be a similar timeframe as is required for the 1997 8-hr ozone standard (deadline of 2023). However, many new technical issues such as modeling for the attainment demonstration and other CAA requirements would require U.S. EPA's guidance, since the previous preambles and guidelines are no longer directly applicable. Based on previous modeling estimates, the control strategies that are needed to attain the 8-hour ozone standard are nearly identical to those that would be needed to attain the 1-hour ozone standard.

PROPOSED CHANGES TO THE FEDERAL PARTICULATE MATTER STANDARDS

The U.S. EPA revoked the annual PM₁₀ standard of 50 µg/m³ and lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³, effective December 17, 2006. At the time,

no changes were made to the existing 24-hour PM₁₀ standard of 150 µg/m³ and the annual PM_{2.5} standard of 15 µg/m³. As part of the requirements of the CAA, every five years, the U.S. EPA must review the ambient air quality standards and propose revisions, if necessary, to “protect public health with an adequate margin of safety,” based on the latest, best-available, science. Under a court order, the U.S. EPA was directed to propose updated standards no later than June 14, 2012. In response to that court order, the U.S. EPA proposed updated national ambient air quality standards for PM_{2.5} on June 14, 2012. U.S. EPA and the litigants have agreed to a proposed consent decree that would require U.S. EPA to issue final standards by December 14, 2012. These proposed revisions to the PM standards also respond to a court remand of two of the existing PM_{2.5} standards, which standards were issued in 2006.

The CAA requires U.S. EPA to set two types of outdoor air quality standards: primary standards, meant to protect public health, and secondary ambient air quality standards, meant to protect the public against adverse environmental effects. When setting air quality standards, the air quality statistics used to determine if an area meets the standard must also be specified. This is known as the “form” of the standard.

The new PM NAAQS rule proposed on June 14, 2012 includes the following:

- **Annual PM_{2.5} standard:** The proposed rule will strengthen the annual PM_{2.5} standard by lowering the level from 15 µg/m³ to a level within the range of 12 µg/m³ to 13 µg/m³. U.S. EPA is also seeking comment and input on alternative levels for the annual PM_{2.5} standard, down to 11 µg/m³. The form of the standard would be unchanged and would be based on the three-year average of an area’s annual average PM_{2.5} concentrations. The current annual PM_{2.5} standard has been in place since 1997.
- **24-hour PM_{2.5} standard:** U.S. EPA is proposing to retain the existing standard of 35 µg/m³ and the current form of the standard, which continues to be based on the 98th percentile of 24-hour PM_{2.5} concentrations measured in a year (averaged over three years) at the monitoring site with the highest measured values in an area. The current 24-hour PM_{2.5} standard has been in place since 2006.
- **24-hour PM₁₀ standard:** U.S. EPA is proposing to retain the existing standard of 150 µg/m³ and the current form of the standard, which continues to be based on the maximum concentrations measured in a year (averaged over three years) at

the monitoring site with the highest measured values in an area. The current 24-hour PM10 standard has been in place since 1987.

Particle pollution causes haze and visibility degradation in cities and some of the country's national parks. Additionally, nitrate and sulfate particles can contribute to acid rain formation, which affects the acidity in water bodies, streams, and rivers, impacting the flora and fauna which rely on those waters for survival. Currently, the secondary PM10 and PM2.5 standards are the same as the primary PM10 and PM2.5 standards, respectively. For secondary standards, the proposed rule includes the following:

- **24-hour PM2.5 secondary standard:** U.S. EPA is proposing to add a 24-hour secondary standard for PM2.5 to protect visibility in urban areas. This standard would be measured in “deciviews”, similar to what is used in the U.S. EPA’s Regional Haze Program. Two alternative levels are being proposed – 30 deciviews and 28 deciviews. The U.S. EPA would calculate a “visibility index” value, using data from fine particle samples that have been analyzed to determine their chemical composition, along with information on the relative humidity of the area. The form of the standard would be the three year average of the 90th percentile of 24-hour visibility index values in one year. U.S. EPA is also seeking additional comment and input on an alternative level, down to 25 deciviews, along with comments on alternate averaging times.
- **Retention of all other secondary standards:** U.S. EPA is proposing to retain all other secondary standards such that they are identical to the primary standards, as discussed previously.

In addition to these revisions, the U.S. EPA is also proposing to revise the public air quality reporting convention, the Air Quality Index (AQI), for PM2.5 by setting the 100 value of the index at the level of the current 24-hour PM2.5 standard, which is 35 µg/m³.

Fine particles come from a variety of sources, including vehicles, and are also formed when emissions from vehicles and other sources undergo atmospheric reactions. The U.S. EPA has proposed changes to the PM2.5 monitoring requirements by including for the first time a requirement for PM2.5 monitoring along heavily traveled roadways in large urban areas. The required monitors, to be located at near-road monitoring sites measuring nitrogen dioxide and carbon monoxide, would have to be operational no later than January 1, 2015.

U.S. EPA anticipates making attainment/nonattainment designations of the new annual PM_{2.5} standard by December 2014, with those designations likely becoming effective in early 2015. States would have until 2020 to meet the new PM_{2.5} NAAQS, with up to a 5-year extension to 2025.

IMPLICATIONS OF THE PROPOSED NEW PM_{2.5} STANDARDS FOR THE BASIN

As presented above, U.S. EPA's proposed rule would strengthen the annual PM_{2.5} standard by lowering the level from 15 µg/m³ to a level within the range of 12 µg/m³ to 13 µg/m³. Based on the baseline modeling performed in Chapter 5, it is projected that the annual PM_{2.5} design value in 2023 will be 13.0 µg/m³ and will occur at the Mira Loma air monitoring station. Thus, the Basin should be able to demonstrate attainment with a 13 µg/m³ NAAQS with already adopted control measures by 2023. With the proposed measures in the Final 2012 AQMP, it may be possible to advance attainment to an earlier date. While the proposed episodic measures are designed to address the 24-hour PM_{2.5} standard, they will also help to achieve annual standards. Alternatively, if the standard is set lower at 12 µg/m³, additional controls may be necessary to demonstrate attainment with the standard by 2025. Whether additional emissions reductions are needed to demonstrate attainment with the potential new primary annual PM_{2.5} NAAQS will depend largely on the level of the standard and other factors, such as economic growth or unfavorable weather. It should also be noted NO_x controls needed for attainment of the 8-hr ozone standard of 80 ppb by 2023 will assist in the attainment of the annual PM_{2.5} standard by 2025 or sooner.

The status of the Basin with regard to the proposed secondary visibility standard cannot be fully assessed until additional implementation guidance is provided by U.S. EPA.