Predecisional Staff Draft
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How will EPA ensure that the 8-hour ozone standard will be implemented in a way which allows an optimal mix of controls for ozone, PM2.5, and regional haze?

Many of the areas that are violating either the 8-hour ozone or PM2.5 NAAQS, may be violating both the 8-hour ozone and PM2.5 NAAQS. Thus, in many cases, States will have ozone and PM2.5 nonattainment areas whose boundaries overlap. Each State is responsible for developing SIP revisions to meet all the requirements relevant to each nonattainment area. In some cases, ozone control measures may help a PM2.5 control strategy or a regional haze plan. Similarly, controls for PM2.5 may provide reductions in ozone or regional haze. For example, considered in isolation, a metropolitan area's ozone strategy might based on additional volatile organic carbon (VOC) emission reductions; if the area needs NOx reductions for PM2.5 attainment, however, an optimal approach might include a more complex ozone strategy using both NOx and VOC reductions. We believe integration of ozone and PM2.5 attainment plans will reduce overall costs of meeting multiple air quality goals. Therefore, EPA is encouraging each State with an ozone nonattainment area which overlaps or is nearby a PM2.5 nonattainment area to take all reasonable steps to coordinate the required revisions for these nonattainment areas. In addition, the State should consider the impact of its ozone and PM2.5 strategies on its regional haze plan.

Many of the factors affecting concentrations of ozone also affect concentrations of PM2.5. Emissions of NOx and/or VOC will lead to formation of organic particles and the precursors of particulate nitrate, as well as ozone. Presence of ozone itself is an important factor affecting PM2.5 formation; as ozone builds up, so do hydroxyl radicals which are instrumental in oxidizing gas phase SO2 to sulfuric acid. The sulfuric acid may be converted to sulfate particles, increasing the PM2.5 concentration. Further, the local ozone concentrations may be decreased by reaction of ozone with nitric oxide; thus, in some large urban areas, a decrease in local NOx emissions can result in higher local ozone concentrations, leading to higher hydroxyl radical concentrations and increases in secondary PM2.5. Because the precursors for ozone and PM2.5 may be transported hundreds of kilometers, regional scale impacts may also need to be considered. The EPA expects that strategies to decrease ozone concentrations will not adversely affect strategies to attain the PM2.5 NAAQS.

The EPA realizes that in some cases development of control plans will be complicated by the need to assess the impact of the precursors of ozone, PM2.5, and regional haze. The question arises whether such areas may be provided more time to perform the more complicated analyses such that an effective multi-pollutant strategy may be developed. However, the statute provides no express relief for these situations. Thus, the State is still responsible for developing and submitting demonstrations which show that the standard will be attained by the applicable date or dates provided.

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States must develop ozone attainment demonstrations for many nonattainment areas. For areas classified serious or above, the "attainment demonstration must be based on photochemical grid modeling or any other analytical method determined by the Administrator, in the Administrator's discretion, to be at least as effective" [section 182(c)(2)(A)]. A photochemical grid model should meet several general criteria for it to be a candidate for consideration in an attainment demonstration. These general criteria are consistent with requirements in 40CFR Part 51, Appendix W (i.e., "*EPA's Guideline on Air Quality Models*"). Note that, unlike previous guidance (U.S. EPA, 1991), EPA is not recommending a specific model for use in the attainment demonstration for the 8-hour NAAQS for ozone. At present, there is no single model which has been extensively tested and shown to be clearly superior or easier to use than several alternatives. Thus, at this time, EPA does not anticipate that the next revision to 40CFR Part 51 Appendix W will identify a "preferred model" for use in attainment demonstrations for the 8-hour NAAQS for ozone. As provided in 40CFR Part 51 Appendix W, States should consider nested regional air quality models or urban scale air quality models as "alternative models" for ozone.

The EPA's recently issued ***[we anticipate completing this guidance at the same time we propose the implementation rule]*** "Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS" provides a set of general requirements that an air quality model should meet to qualify for use in an attainment demonstration for the 8-hour ozone NAAQS. These include having received a scientific peer review, being applicable to the specific application on a theoretical basis, and having an adequate data base to support its application. It is also important that past applications indicate model estimates are not likely to be biased low and that the model is applied consistently with a protocol on methods and procedures. The modeling guidance lists several current generation air quality models which have been used to simulate ambient ozone concentrations. The list is not intended to be comprehensive. Exclusion of a model from the list does not necessarily imply that it cannot be used to support a modeled attainment demonstration for the 8-hour ozone NAAQS. By the same token, inclusion on the list does not necessarily imply that a model may be used for a particular application. Several of the models in the list have been or are currently being updated to include the PM2.5 chemistry. In general, attainment demonstrations should follow the current modeling guidance addressing ozone and PM2.5 and any applicable regulatory requirements. The State should consult with EPA prior to selection of a modeling technique.

For several years, EPA guidance has encouraged States to integrate ozone control strategies with strategies designed later to attain the NAAQS for PM2.5 and to meet reasonable progress goals for regional haze (May 1999 "Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS"). The draft guidance presents some modeling/analysis principles to help States develop data bases and capabilities for considering joint effects of control strategies for ozone, PM2.5 and regional haze. Because emissions and meteorological conditions vary seasonally, the guidance recommends assessing the effects of an ozone control strategy on annual PM2.5 concentrations by estimating effects on mean PM2.5 for each season and using the resulting information to estimate annual impacts.

Emission estimates for VOC, NOx, primary PM2.5 , sulfur dioxide and ammonia will be needed. In addition, the modeling should separately estimate the effects of the ozone strategy on the major components of PM2.5: mass associated with sulfates, nitrates, organic carbon, elemental carbon, and all other species. The EPA believes that this approach is adequate to ensure that the 8-hour ozone standard will be implemented by States in a way that allows an optimal mix of controls for ozone, PM2.5, and regional haze.

Similarly, EPA's attainment demonstration guidance for PM2.5 and regional haze states that models intended to address secondary particulate matter problems should also be capable of simulating ozone formation and transport (January 2, 2001 "Guidance for Demonstrating Attainment of Air Quality Goals for PM2.5 and Regional Haze"). The formation and transport of secondary particulate matter are closely related to processes that are important in the formation and transport of ozone. Thus, it makes sense for programs designed to control ozone to be cognizant of programs to reduce PM2.5 and improve visibility and vice versa. The PM2.5 guidance suggests conducting a "mid-course review" of an approved PM2.5 plan to review changes in air quality resulting from implementation of plans to reduce PM2.5, regional haze, and ozone.

The EPA believes that a mid-course review of an approved 8-hour ozone plan is also important. In order to conduct the mid-course review, baseline information from the initial ozone plan analyses should be compared to monitored data collected for purposes of mid-course review. The EPA recommends that States consider the following in planning for mid-course reviews. First, continue to improve data bases. Second, retain the means to perform modeling/analysis. Third, make emission and air quality projections for the year when mid-course review is anticipated. Finally, retain modeling input and output files used to simulate base emissions, emission projections for the mid-course review year, and projected emissions at the time of required attainment or at the end of the first iteration of the plan to make reasonable progress reducing regional haze. Only the files reflecting the strategy approved in the approved SIP revision need be retained.

Today, EPA proposes to continue its policy of encouraging States to integrate control strategies to attain the 8-hour ozone NAAQS with those strategies designed to attain the NAAQS for PM2.5 and meet reasonable progress goals for regional haze. Specifically, EPA encourages States conducting modeling analyses for ozone to separately estimate effects of a strategy on the following: mass associated with sulfates, nitrates, organic carbon, elemental carbon, and all other species. In addition, EPA invites comment on the alternative approach of requiring States to conduct these additional analyses and, if so, to also identify what authority allows EPA to do so.

The EPA also proposes to encourage States to identify information from the initial 8-hour ozone plan analyses and to compare the information with monitored data during a mid-course review of an approved plan. States should maintain modeling and analysis capabilities after

approval of their initial SIP revisions addressing the NAAQS for ozone, PM2.5 and regional haze. The EPA invites comment on the alternative approach of requiring States to conduct this mid-course review and, if so, to also identify what authority allows EPA to do so.