

that would have required an effectiveness determination by the Administrator.⁴

Under "Guidance on the Use Of Modeled Results to Demonstrate Attainment of the Ozone NAAQS," EPA-454/B-95-007, June 1996 (hereafter the 1996 Guidance), the modeled attainment test compares model predicted 1-hour daily maximum ozone concentrations in all grid cells for the attainment year to the level of the NAAQS. The results may be interpreted through either of two modeled attainment or exceedance tests: A deterministic test or a statistical test. Under the deterministic test, a predicted concentration above 0.124 parts per million (ppm) ozone indicates that the area is expected to exceed the standard in the attainment year and a prediction at or below 0.124 ppm indicates that the area is expected to not exceed the standard. Under the statistical test, attainment is demonstrated when all predicted (*i.e.*, modeled) 1-hour ozone concentrations inside the modeling domain are at, or below, an acceptable upper limit above the NAAQS permitted under certain conditions (depending on the severity of the episode modeled).

Based upon our experience with application of the models, which we did not have in 1991, EPA issued the 1996 Guidance to update the 1991 guidance referenced in 40 CFR part 50, appendix W, to make the modeled attainment test more closely reflect the form of the NAAQS (*i.e.*, the statistical test described above), and the meteorological conditions accompanying observed exceedances. The 1996 Guidance also allows for consideration of additional evidence to address uncertainties in the modeling databases and application. Therefore, when modeling does not conclusively demonstrate attainment, EPA has concluded that additional analyses may be presented to help determine whether the area will attain the standard. As with other predictive tools, there are inherent uncertainties associated with air quality modeling and its results. The inherent imprecision of the model means that it may be inappropriate to view the specific numerical result of the model as the only determinant of whether the SIP controls are likely to lead to attainment.

EPA's 1996 Guidance recognizes these limitations, and provides a means for considering other evidence to help assess whether attainment of the

NAAQS is likely to be achieved. The process by which this is done is called a weight-of-evidence or WOE determination. Under a WOE determination, the state can rely on, and EPA will consider factors such as other modeled output (*e.g.*, changes in the predicted frequency and pervasiveness of 1-hour ozone NAAQS exceedances); actual observed air quality trends (*i.e.*, analyses of monitored air quality data); estimated emissions trends; and the responsiveness of the model predictions to further controls in addition to the results of the modeled attainment test.

In 1999, EPA issued additional guidance (hereafter, the 1999 Guidance)⁵ that makes further use of model results for base case and future emission estimates to predict a future design value. This guidance describes the use of an additional component of the WOE determination, which requires, under certain circumstances, additional emission reductions that are or will be approved into the SIP, but that were not included in the modeling analysis, that will further reduce the modeled design value. An area is considered to monitor attainment if each monitor site has air quality observed ozone design values (4th highest daily maximum ozone using the three most recent consecutive years of data) at or below the level of the standard (which is 124 ppb). Therefore, it is appropriate for EPA, when making a determination that a control strategy will provide for attainment, to determine whether or not the model predicted future design value is expected to be at or below the level of the standard.

Since the form of the 1-hour ozone NAAQS allows exceedances, it did not seem appropriate for EPA to require the test for attainment to be "no exceedances" in the future model predictions. The method outlined in the 1999 Guidance uses the highest measured design value from all sites in the nonattainment area for each of three years. The three year "design value" represents the air quality observed during the time period used to predict ozone for the base emissions. This is appropriate because the model is predicting the change in ozone from the base period to the future attainment date. The "design value" calculation accounts for the fact that the NAAQS allows limited exceedances of the ozone standard without a resulting violation.

⁵ "Guidance for Improving Weight of Evidence Through Identification of Additional Emission Reductions, Not Modeled." U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Air Quality Modeling Group, Research Triangle Park, NC 27711.

The three yearly design values (highest across the area) are averaged to account for annual fluctuations in meteorology.⁶ The result is an estimate of an area's base year design value. The base year design value is multiplied by a ratio of the peak model predicted ozone concentrations in the attainment year (*i.e.*, average of daily maximum concentrations from all days modeled) to the peak model predicted ozone concentrations in the base year (*i.e.*, average of daily maximum concentrations from all days modeled). The result is an attainment year design value based on the relative change in peak model predicted ozone concentrations from the base year to the attainment year.

The use of this analytical adjunct, however, does not mean that a state's attainment demonstration is "based on" something other than photochemical grid modeling, or that WOE is "less effective" than photochemical grid modeling. To the contrary, WOE analysis is used to assess the photochemical grid modeling results; it supplements, but does not replace, the modeling. See 1996 Guidance at S-1 ("In a weight of evidence determination, model results are weighed heavily"). It follows that the WOE approach is consistent with the CAA requirement that the attainment demonstration "be based on photochemical grid modeling," because WOE is merely an adjunct for assessing the photochemical grid modeling. In the case of the Washington area demonstration, photochemical grid modeling is the primary basis for the attainment demonstration. See 1996 Guidance at S-1.

The 1999 Guidance is reasonable and is not a proportional rollback.

As stated previously, episodic photochemical grid modeling is the primary basis for the attainment demonstration, as it was used to define the majority of the control strategy. However, the modeling and corroborative analyses, which form the basis of the weight of evidence analysis, provide a preponderance of evidence to

⁶ The commenter criticized the 1999 Guidance because it allegedly allows the averaging across the three highest air quality sites across a region, whereas EPA's earlier (1991 and 1996) modeling guidance requires that attainment be demonstrated at each site and, thus, effectively lowers the total emission reductions needed to attain at the highest site. The commenter's concern is misplaced. The 1999 Guidance uses averaging of the worst modeled air quality value across episode days or worst design value across a three year period. Also, the WOE determination, in turn, is intended to be a qualitative assessment of whether additional factors (including the additional emissions reductions not modeled), taken as a whole, indicate that the area is more likely than not to attain.

⁴ For the same reasons, EPA was not required to address whether its 1996 or 1999 Modeling Guidance is a "substitute" for modeling or is an adequate model by itself.