

emissions being emitted into the atmosphere. Since the first day of each episode was not considered, this leaves six days for strategy assessment. August 16, 1987 was also not used for strategy assessment. This leaves five strategy days: August 15, 1987; August 17, 1987; June 22, 1988; July 8, 1988 and July 11, 1988.

The CALGRID model was run using the CALMET meteorological processor. This processor took actual meteorological data collected by the National Weather Service and the State Air Pollution Agencies and using extrapolation and other analysis techniques provided winds, temperatures and other meteorological parameters at approximately 400 specific grid points for each hour of the episode up to 14 levels (*i.e.*, from the surface to top of the model which is about 5000 feet). CALMET is described in detail in the Rhode Island attainment demonstration, and was approved by EPA for use in the CALGRID modeling system.

The CALGRID model was run with emissions data prepared by EPA Region I and/or a contractor working with EPA Region I. The data were taken from the EPA Aerometric Information Retrieval System (AIRS) data base in late 1993 and reflect the emission data supplied from the six New England States. The emission data for the small portion of New York state that forms the western edge of the domain was supplied by New York. EPA Region I quality assured all the New England AIRS data, the New York supplied data and all necessary modifications to the data. The data was further processed through the Emissions Preprocessor System (EPS Version 2.0). To more accurately model ozone in New England, day specific emissions were simulated for on-road mobile sources (cars, trucks, busses, etc.), and for large fossil-fueled fired power plants in New England. The base case CALGRID model is consistent with EPA guidance on model performance.

Future emissions were projected to 1999 and 2007 accounting for both emission increases due to industrial growth, population growth and growth in the number of miles traveled by cars, as well as emission reductions due to cleaner gasoline, cleaner cars and controls on industrial pollution. Growth factors were derived using the EPA-approved Bureau of Economic Analysis (BEA) factors and all the emissions were processed using the EPS 2.0 system.

Model runs were also performed for the year 2007. The runs employed 2007 emission estimates inside the New England Domain, along with boundary condition files reflecting EPA's NO_x SIP

Call emission estimates in upwind areas. Year 2007 emissions estimates for the states inside the modeling domain reflected EPA's NO_x SIP call as well as other federal and state control strategies being implemented by the beginning of the 2007 ozone season. This was accomplished using a two-step process. The first step was to project emissions using growth factors to account for increases or decreases in economic activity by industrial sector. In general, the states projected their emissions using the same growth factors that were used in the OTAG modeling effort. The second step involved applying control factors to source categories that would be regulated by the year 2007. States used a combination of information for control levels: those used for the OTAG modeling effort, and state-specific information relating to the effectiveness of control programs planned or in place. These 2007 emission estimates did not, however, include the Tier 2/Gasoline Sulfur program that was subsequently adopted by EPA on February 10, 2000 (65 FR 6698). The ozone reductions in 2007 from the Tier 2/Gasoline Sulfur program are discussed in Section VII.C.4.

C. What Are the Conclusions From the Modeling?

The EPA guidance for approval of the modeling aspect of a one-hour ozone attainment demonstration is to use the one-hour ozone grid modeling to apply one of two modeled attainment tests (deterministic or statistical) with optional weight-of-evidence analyses to supplement the modeled attainment test results when the modeled attainment test is failed. For the July 8, 1988 ozone episode, the deterministic test is passed for the future year 2007 for Rhode Island (*i.e.* all grid cells for every hour of that day using 2007 emissions are below 0.124 ppm). For the other modeled strategy days (*i.e.*, August 15, 1987; August 17, 1987; June 22, 1988; and July 11, 1988), neither the 1999 nor the 2007 CALGRID modeling performed for the Rhode Island area predicts ozone concentrations below the one-hour ozone standard (0.124 ppm) at every grid cell for every hour of every strategy day modeled. The maximum predicted 2007 concentration in the Rhode Island nonattainment area for the relevant episodes is 0.140 ppm, which occurred for the July 11 episode. The 2007 modeling was performed for two episode days: July 8 and July 11. Only these two days could be run for 2007, because 2007 boundary conditions were not available for the other strategy days. This maximum concentration is in western Rhode Island on the border

with Connecticut, and is the result of transport into Rhode Island. Since the CALGRID model does not predict ozone concentrations below the one-hour ozone standard (0.124 ppm) at every grid cell for every hour of every episode day modeled, the strict deterministic test is not passed. Although the CALGRID model, as run for this analysis, does not pass the strict deterministic test at every grid cell, when additional weight-of-evidence analyses are considered, attainment is demonstrated.

Rhode Island submitted an analysis using the model predicted change in ozone to estimate a future air quality design value. In this analysis, Rhode Island uses the photochemical ozone modeling in a relative sense. In other word, Rhode Island uses the modeled ozone concentrations, from the EPA-approved CALGRID model, in conjunction with monitored ozone air quality data. Rhode Island conducted an analysis which shows how the photochemical modeling results, when applied to ozone design values at the West Greenwich, East Providence and Narragansett monitors, predict attainment at these three monitors by 2007 after taking into account anticipated emission reductions from the NO_x SIP call and the Tier 2/Low Sulfur program. The results show that with the planned emission reductions in the two precursor emissions (VOC and NO_x), ground-level ozone concentrations will be below the ambient standard by the 2007 attainment date. The steps Rhode Island DEM used in this analysis are discussed in the next four subsections.

1. Base Year Ozone Design Values

In the attainment demonstration, Rhode Island DEM reviewed ozone monitoring data to determine a base-year design value for each monitor in Rhode Island. Ozone data collected in 1995, 1996, and 1997 were used for calculating 1997 design values. Using 1997 design values versus 1999 design values results in a conservative analysis.

2. Ozone Reduction Between 1999 and 2007

The second step of this approach consists of comparing photochemical modeling run results in order to determine the predicted ozone reduction at each ozone monitor in Rhode Island between 1999 and 2007. Modeling runs were not performed for 1997 but were performed for 1999. The Rhode Island DEM's use of modeling results for 1999 is conservative since as emissions reductions that occurred between 1997 and 1999 are not