

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 52

[IN90-1; FRL-6503-2]

### Approval and Promulgation of Implementation Plans; Indiana; Ozone

**AGENCY:** Environmental Protection Agency.

**ACTION:** Proposed rule.

**SUMMARY:** The Environmental Protection Agency (EPA) is proposing to conditionally approve the 1-hour ozone attainment demonstration State Implementation Plan (SIP or plan) for the Chicago-Gary-Lake County severe ozone nonattainment area submitted by the Indiana Department of Environmental Management (IDEM) on April 30, 1998. This proposed conditional approval is based on the submitted modeling analysis and on the State's commitments to adopt and submit a final ozone attainment demonstration SIP and a post-1999 Rate of Progress (ROP) plan, including the necessary State air pollution control regulations to complete the attainment demonstration and ROP plans, by December 31, 2000. The EPA is also proposing, in the alternative, to disapprove this attainment demonstration plan if, by December 31, 1999, the State does not select a control strategy associated with its submitted modeling analysis and submits adequate motor vehicle emissions budgets for Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NO<sub>x</sub>) for the ozone nonattainment area that comply with EPA's conformity regulations and that are derived from the selected emissions control strategy that supports attainment of the 1-hour ozone standard. In addition, the State must, by December 31, 1999, submit an enforceable commitment to conduct a mid-course review of the ozone attainment plan in 2003.

**DATES:** Written comments must be received on or before February 14, 2000.

**ADDRESSES:** Written comments should be sent to: Jay Bortzer, Chief, Regulation Development Section, Air Programs Branch (AR-18J), U.S. Environmental Protection Agency, 77 West Jackson Boulevard, Chicago, Illinois 60604.

Copies of the State submittal and EPA's technical support document are available for public inspection during normal business hours at the following address: United States Environmental Protection Agency, Region 5, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604.

(Please telephone Mark Palermo at (312) 886-6082 before visiting the Region 5 Office.)

**FOR FURTHER INFORMATION CONTACT:**

Edward Doty, Regulation Development Section, Air Programs Branch (AR-18J), U.S. Environmental Protection Agency, Region 5, 77 West Jackson Boulevard, Chicago, Illinois 60604, Telephone Number (312) 886-6057, E-Mail Address doty.edward@epamail.epa.gov.

**SUPPLEMENTARY INFORMATION:** This section provides background information on attainment demonstration SIPs for the 1-hour ozone National Ambient Air Quality Standard (NAAQS or standard) and an analysis of Indiana's 1-hour ozone attainment demonstration for the Chicago-Gary-Lake County ozone nonattainment area.

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**I. Background Information**

*A. Basis for the State's Attainment Demonstration SIP*

What Are the Relevant Clean Air Act Requirements?

The Clean Air Act requires the EPA to establish national ambient air quality standards for certain widespread pollutants that cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Clean Air Act sections 108 and 109. In 1979, EPA promulgated the 1-hour 0.12 parts per million (ppm) ground-level ozone standard. 44 FR 8202 (Feb. 8, 1979). Ground-level ozone is not emitted directly by sources. Rather, emissions of NO<sub>x</sub> and VOC react in the presence of sunlight to form ground-level ozone. NO<sub>x</sub> and VOC are referred to as precursors of ozone.

An area exceeds the 1-hour ozone standard each time an ambient air quality monitor records a 1-hour average ozone concentration above 0.124 ppm on any day. An area violates the standard if, over a consecutive 3-year period, more than 3 daily exceedances are expected to occur at any monitor in the area or in its immediate downwind environs. The highest of the fourth-highest daily peak ozone concentrations over the 3 year period at any one monitoring site in the area is called the design value for the area. The Clean Air Act, as amended in 1990, required EPA to designate as nonattainment any area that was violating the 1-hour ozone standard, generally based on air quality monitoring data from the 3-year period from 1987 through 1989. Clean Air Act

section 107(d)(4); 56 FR 56694 (Nov. 6, 1991). The Clean Air Act further classified these areas, based on the areas' design values, as marginal, moderate, serious, severe or extreme. Clean Air Act section 181(a). Marginal areas were suffering the least significant air quality problems while the areas classified as severe and extreme had the most significant air quality problems.

The control requirements and date by which attainment needs to be achieved vary with an area's classification. Marginal areas are subject to the fewest mandated control requirements and have the earliest attainment date. Severe and extreme areas are subject to more stringent planning requirements but are provided more time to attain the standard. Serious areas are required to attain the 1-hour standard by November 15, 1999, and severe areas are required to attain by November 15, 2005 or November 15, 2007, depending on the areas' ozone design values. The Chicago-Gary-Lake County ozone nonattainment area is classified as severe-17 and its attainment date is November 15, 2007. The Chicago-Gary-Lake County ozone nonattainment area is defined (40 CFR 81.314 and 81.315) to contain Cook, DuPage, Grundy (Aux Sable and Goose Lake Townships only), Kane, Kendall (Oswego Township only), Lake, McHenry, and Will Counties in Illinois, and Lake and Porter Counties in Indiana. This proposed rulemaking focuses on the Indiana portion of this nonattainment area. A separate proposed rulemaking in today's **Federal Register** deals with the Illinois portion of this nonattainment area.

Under section 182(c)(2) and (d) of the Clean Air Act, serious and severe areas were required to submit, by November 15, 1994, demonstrations of how they would attain the 1-hour standard and how they would achieve ROP reductions in VOC emissions of 9 percent for each 3-year period until the attainment. (In some cases, NO<sub>x</sub> emission reductions can be substituted for the required VOC emission reductions to achieve ROP.) Today, in this proposed rule, EPA is proposing action on the attainment demonstration SIP submitted by Indiana for the Chicago-Gary-Lake County ozone nonattainment area and its associated ozone modeling domain and on the State's commitment to complete the attainment demonstration SIP for this ozone nonattainment area by December 2000. EPA is also proposing action on the State's commitment to submit ROP target calculations and the adopted measures to achieve ROP by December 2000. In addition, elsewhere in this **Federal Register**, EPA is today

proposing to take action on ozone attainment demonstration SIPs, and, in some cases ROP SIPs, for other serious or severe 1-hour ozone nonattainment areas. The additional ozone attainment demonstration and ROP SIPs addressed elsewhere in this **Federal Register** cover the ozone nonattainment areas of Greater Connecticut (CT), Springfield (Western Massachusetts) (MA), New-York-North New Jersey-Long Island (NY-NJ-CT), Baltimore (MD), Philadelphia-Wilmington-Trenton (PA-NJ-DE-MD), Metropolitan Washington D.C. (DC-MD-VA), Atlanta (GA), Milwaukee-Racine (WI), Chicago-Gary-Lake County (IL-IN) (Illinois portion of this area), and Houston-Galveston-Brazoria (TX).

In general, an attainment demonstration SIP includes a modeling analysis component showing how the area will achieve the standard by its attainment date and the emission control measures necessary to achieve attainment. Another component of the attainment demonstration SIP is a motor vehicle emissions budget for transportation conformity purposes. Transportation conformity is a process for ensuring that States consider the effects of emissions associated with new or improved federally-funded roadways on attainment of the standard. As described in section 176(c)(2)(A) of the Clean Air Act, attainment demonstrations necessarily include the estimates of motor vehicle emissions that are consistent with attainment, which then act as a budget or ceiling for the purposes of determining whether transportation plans and projects conform to the attainment SIP.

What is the History and Time Frame for the State Attainment Demonstration SIP and How Is It Related to the NO<sub>x</sub> SIP Call?

Notwithstanding significant efforts by the States, in 1995 EPA recognized that many States in the eastern half of the United States could not meet the November 1994 time frame for submitting an attainment demonstration SIP because emissions of NO<sub>x</sub> and VOC in upwind States (and the ozone formed by these emissions) affected these nonattainment areas and the full impact of this effect had not yet been determined. This phenomenon is called ozone transport.

On March 2, 1995, Mary D. Nichols, EPA's then Assistant Administrator for Air and Radiation, issued a memorandum to EPA's Regional Administrators acknowledging the efforts made by States but noting the remaining difficulties in making attainment demonstration SIP

submittals.<sup>1</sup> Recognizing the problems created by ozone transport, the March 2, 1995 memorandum called for a collaborative process among the States in the eastern half of the country to evaluate and address transport of ozone and its precursors. This memorandum led to the formation of the Ozone Transport Assessment Group (OTAG)<sup>2</sup> and provided for the States to submit the attainment demonstration SIPs based on the expected time frames for OTAG to complete its evaluation of ozone transport.

In June 1997, OTAG concluded and provided EPA with recommendations regarding ozone transport. The OTAG generally concluded that transport of ozone and the precursor NO<sub>x</sub> is significant and should be reduced regionally to enable States in the eastern half of the country to attain the ozone NAAQS.

In recognition of the length of the OTAG process, in a December 29, 1997 memorandum, Richard Wilson, EPA's then Acting Assistant Administrator for Air and Radiation, provided until April 1998 for States to submit the following elements of their attainment demonstration SIPs for serious and severe nonattainment areas: (1) Evidence that the applicable control measures in subpart 2 of part D of title I of the Clean Air Act were adopted and implemented or were on an expeditious course to being adopted and implemented; (2) a list of measures needed to meet the remaining ROP emissions reduction requirement and to reach attainment; (3) for severe areas only, a commitment to adopt and submit the control measures necessary for attainment and the ROP plans through the attainment year by the end of 2000<sup>3</sup>; (4) a commitment to

implement the SIP control programs in a timely manner and to meet ROP emissions reductions and attainment; and (5) evidence of a public hearing on the State submittal.<sup>4</sup> This submission is sometimes referred to as the Phase II submission. Motor vehicle emission budgets can be established based on a commitment to adopt the measures needed for attainment and identification of the measures needed. Thus, State submissions due in April 1998 under the Wilson policy should have included a motor vehicle emissions budget.

Building upon the OTAG recommendations and technical analyses, in November 1997, EPA proposed action addressing the ozone transport problem. In its proposal, the EPA found that current SIPs in 22 States and the District of Columbia (23 jurisdictions) were insufficient to provide for attainment and maintenance of the 1-hour standard because they did not regulate NO<sub>x</sub> emissions that significantly contribute to ozone transport. 62 FR 60318 (Nov. 7, 1997). The EPA finalized that rule in September 1998, calling on the 23 jurisdictions to revise their SIPs to require NO<sub>x</sub> emissions reductions within each State to a level consistent with a NO<sub>x</sub> emissions budget identified in the final rule. 63 FR 57356 (Oct. 27, 1998). This final rule is commonly referred to as the NO<sub>x</sub> SIP call.

What Is the Time Frame for Taking Action on the Attainment Demonstration SIPs for the Serious and Severe Nonattainment Areas?

The States generally submitted the SIPs between April and October 1998; some States are still submitting additional revisions. Under the Clean Air Act, EPA is required to approve or disapprove a State's submission no later than 18 months following submission. (The statute provides up to 6 months for a completeness determination and an additional 12 months for approval or disapproval.) The EPA believes that it is important to keep the process moving forward in evaluating these plans and, as appropriate, approving them. Thus, in today's **Federal Register**, EPA is proposing to take action on the serious and severe 1-hour ozone attainment demonstration SIPs and intends to take

nonattainment areas submitted the actual adopted control measures and are not relying on a commitment.

The EPA recognizes that motor vehicle emission budgets can be established from the items listed in the Wilson memorandum.

<sup>4</sup>Memorandum, "Guidance for Implementing the 1-Hour Ozone and Pre-Existing PM 10 NAAQS," issued December 29, 1997. A copy of this memorandum may be found on EPA's web site at <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

<sup>1</sup>Memorandum, "Ozone Attainment Demonstrations," issued March 2, 1995. A copy of the memorandum may be found on EPA's web site at <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

<sup>2</sup>Letter from Mary A. Gade, Director, State of Illinois Environmental Protection Agency to Environmental Council of States (ECOS) Members, dated April 13, 1995.

<sup>3</sup>In general, a commitment for severe areas to adopt by December 2000 the control measures necessary for attainment and ROP plans through the attainment year applies to any additional measures necessary for attainment that were not otherwise required to be submitted earlier. (For example, this memorandum was not intended to allow States to delay submission of measures required under the Clean Air Act, such as inspection and maintenance (I/M) programs or reasonable available control technology (RACT) regulations, required at an earlier time.) Thus, this commitment applies to any control measures or emission reductions on which the State relied for purposes of the modeled attainment demonstration. To the extent Indiana has relied on a commitment to submit these measures by December 2000, EPA is proposing a conditional approval of the attainment demonstration. Some States with severe

final action on these submissions over the next 6–12 months. The reader is referred to individual dates in this document for specific information on actions leading to EPA's final rulemaking on these plans.

#### What Are the Options for Action on the State Attainment Demonstration SIPs?

Depending on the circumstances unique to each of the SIP submissions on which EPA is proposing action today, EPA is proposing one or more of these types of approval or disapproval in the alternative. In addition, these proposals may identify additional actions that will be necessary from the State.

The Clean Air Act provides for EPA to approve, disapprove, partially approve or conditionally approve a State's plan submission. The EPA must fully approve the submission if it meets the attainment demonstration requirement of the Clean Air Act. If the submission is deficient in some way, EPA may disapprove the submission. In the alternative, if portions of the submission are approvable, EPA may partially approve and partially disapprove, or may conditionally approve based on a State's commitment to correct the deficiency by a date certain, which can be no later than one year from the date of EPA's final conditional approval.

The EPA may partially approve a submission if separable parts of the submission, standing alone, are consistent with the Clean Air Act. For example, if a State submits a modeled attainment demonstration, including control measures, but the modeling does not demonstrate attainment, EPA could approve the control measures and disapprove the modeling for failing to demonstrate attainment.

The EPA may issue a conditional approval based on a State's commitment to expeditiously correct a deficiency by a date certain that can be no later than one year following EPA's final conditional approval. Such commitments do not need to be independently enforceable because, if the State does not fulfill its commitment, the conditional approval is converted to a disapproval after the deadline for the correction of the deficiency. For example, if a State commits to submit additional control measures and fails to submit them or EPA determines the State's submission of the control measures is incomplete, the EPA will notify the State by letter that the conditional approval has been converted to a disapproval. If the State submits control measures that EPA determines are complete or that are

deemed complete, EPA will determine through rulemaking whether the State's attainment demonstration is fully approvable or whether the conditional approval of the attainment demonstration should be converted to a disapproval.

Finally, EPA has recognized that in some limited circumstances, it may be appropriate to issue a full approval for a submission that consists, in part, of an enforceable commitment. Unlike the commitment for conditional approval, such an enforceable commitment can be enforced in court by EPA or citizens. In addition, this type of commitment may extend beyond one year following EPA's approval action. Thus, EPA may accept such an enforceable commitment where it is infeasible for the State to accomplish the necessary action in the short term.

#### B. Components of a Modeled Attainment Demonstration

The EPA provides that States may rely on a modeled attainment demonstration supplemented with additional evidence to demonstrate attainment.<sup>5</sup> In order to have a complete modeling demonstration submission, States should have submitted the required modeling analysis and identified any additional evidence that EPA should consider in evaluating whether the area will attain the standard.

#### What Are the Modeling Requirements for the Attainment Demonstration?

For purposes of demonstrating attainment, the Clean Air Act requires serious and severe areas to use photochemical grid modeling or an analytical method EPA determines to be as effective. The photochemical grid model is set up using meteorological conditions conducive to the formation of ozone. Emissions for a base year are used to evaluate the model's ability to reproduce actual monitored air quality values. Following validation of the modeling system for a base year, emissions are projected to an attainment year to predict air quality changes in the attainment year due to the emission changes, which include growth up to and controls implemented by the

attainment year. A modeling domain is chosen that encompasses the nonattainment area. Attainment is demonstrated when all predicted concentrations inside the modeling domain are at or below the NAAQS or at an acceptable upper limit above the NAAQS permitted under certain conditions by EPA's guidance. When the predicted concentrations are above the NAAQS, an optional weight of evidence determination which incorporates, but is not limited to, other analyses, such as air quality and emissions trends, may be used to address uncertainty inherent in the application of photochemical grid models.

The EPA guidance identifies the features of a modeling analysis that are essential to obtain credible results. First, the State must develop and implement a modeling protocol. The modeling protocol describes the methods and procedures to be used in conducting the modeling analyses and provides for policy oversight and technical review by individuals responsible for developing or assessing the attainment demonstration (State and local agencies, EPA Regional offices, the regulated community, and public interest groups). Second, for purposes of developing the information to put into the model, the State must select air pollution days, *i.e.*, days in the past with high ozone concentrations exceeding the standard, that are representative of the ozone pollution problem for the nonattainment area. Third, the State needs to identify the appropriate dimensions of the area to be modeled, *i.e.*, the modeling domain size. The domain should be larger than the designated nonattainment area to reduce uncertainty in the boundary conditions and should include any large upwind sources just outside the nonattainment area. In general, the domain is considered the local area where control measures are most beneficial to bring the area into attainment. Fourth, the State needs to determine the grid resolution. The horizontal and vertical resolutions in the model affect the dispersion and transport of emission plumes. Artificially large grid cells (too few vertical layers and horizontal grids) may dilute concentrations and may not properly consider impacts of complex terrain, complex meteorology, and land/water interfaces. Fifth, the State needs to generate meteorological data and emissions that describe atmospheric conditions and emissions inputs reflective of the selected high ozone days. Finally, the State needs to verify that the modeling system is properly

<sup>5</sup>The EPA issued guidance on the air quality modeling that is used to demonstrate attainment with the 1-hour ozone NAAQS. See U.S. EPA, (1991), Guideline for Regulatory Application of the Urban Airshed Model, EPA-450/4-91-013, (July 1991). A copy may be found on EPA's web site at <http://www.epa.gov/ttn/scram/> (file name: "UAMREG"). See also U.S. EPA, (1996), Guidance on Use of Modeled Results to Demonstrate Attainment of the Ozone NAAQS, EPA-454/B-95-007, (June 1996). A copy may be found on EPA's web site at <http://www.epa.gov/ttn/scram/> (file name: "O3TEST").

simulating the chemistry and atmospheric conditions through diagnostic analyses and model performance tests (generally referred to as model validation). Once these steps are satisfactorily completed, the model is ready to be used to generate air quality estimates to support an attainment demonstration.

The modeled attainment test compares model-predicted 1-hour daily maximum concentrations in all grid cells for the attainment year to the level of the NAAQS. A predicted peak ozone concentration above 0.124 ppm indicates that the area is expected to exceed the standard in the attainment year. This type of test is often referred to as an exceedance test. The EPA's guidance recommends that States use either of two modeled attainment or exceedance tests for the 1-hour ozone NAAQS: A deterministic test or a statistical test.

The deterministic test requires the State to compare predicted 1-hour daily maximum ozone concentrations for each modeled day<sup>6</sup> to the attainment level of 0.124 ppm. If none of the predictions exceed 0.124 ppm, the test is passed.

The statistical test takes into account the fact that the form of the 1-hour ozone standard allows exceedances. If, over a 3-year period, the area has an average of 1 or fewer exceedances per year at any monitoring site, the area is not violating the standard. Thus, if the State models a very extreme day (considering meteorological conditions that are very conducive to high ozone levels and that should lead to fewer than 1 exceedance per year at any location in the nonattainment area and modeling domain over a 3 year period), the statistical test provides that a prediction above 0.124 ppm up to a certain upper limit may be consistent with attainment of the standard. (The form of the 1-hour standard allows for up to 3 days with peak 1-hour ozone concentrations above the standard over a 3-year period at any monitoring site before an area is considered to be in violation of the NAAQS.)

The acceptable upper limit above 0.124 ppm is determined by examining the size of exceedances at monitoring sites which meet the 1-hour NAAQS. For example, a monitoring site for which the four highest 1-hour average concentrations over a 3-year period are 0.136 ppm, 0.130 ppm, 0.128 ppm and 0.122 ppm is attaining the standard. To identify an acceptable upper limit, the statistical likelihood of observing ozone air quality exceedances of the standard

of various concentrations is equated to severity of the modeled day. The upper limit generally represents the maximum ozone concentration observed at a location on a single day and it would be the only reading above the standard that would be expected to occur no more than an average of once a year over a 3-year period. Therefore, if the maximum ozone concentration predicted by the model is below the acceptable upper limit, in this case 0.136 ppm, then EPA might conclude that the modeled attainment test is passed. Generally, exceedances well above 0.124 ppm are very unusual at monitoring sites meeting the NAAQS. Thus, these upper limits are rarely substantially higher than the attainment level of 0.124 ppm.

#### What Are the Additional Analyses That May Be Considered When the Modeling Fails To Show Attainment?

When the modeling does not conclusively demonstrate attainment, 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 modeling and its results. For example, there are uncertainties in some of the modeling inputs, such as the meteorological and emissions data bases for individual days and in the methodology used to assess the severity of an exceedance at individual sites. The EPA's guidance recognizes these limitations, and provides a means for considering other evidence to help assess whether attainment of the NAAQS is likely. The process by which this is done is called a weight-of-evidence (WOE) determination.

Under a WOE determination, the State can rely on and EPA will consider factors such as: other modeled attainment tests, e.g., a rollback analysis; other modeled outputs, e.g., changes in the predicted frequency and pervasiveness of exceedances and predicted changes in the design value; actual observed air quality trends; estimated emissions trends; analyses of air quality monitored data; the responsiveness of the model predictions to further controls; and, whether there are additional control measures that are or will be approved into the SIP but were not included in the modeling analysis. This list is not an exhaustive list of factors that may be considered and these factors could vary from case to case. The EPA's guidance contains no limit on how close a modeled attainment test must be to passing to conclude that other evidence besides an attainment test is sufficiently compelling to suggest attainment.

However, the further a modeled attainment test is from being passed, the more compelling the WOE needs to be.

The EPA's 1996 modeling guidance also recognizes a need to perform a mid-course review as a means for addressing uncertainty in the modeling results. Because of the uncertainty in long term projections, EPA believes a viable attainment demonstration that relies on a WOE determination needs to contain provisions for periodic review of monitoring, emissions, and modeling data to assess the extent to which refinements to emission control measures are needed. The mid-course review is discussed below.

#### C. Framework for Proposing Action on the Attainment Demonstration SIPs

Besides the Modeled Attainment Demonstration, What Other Issues Must be Addressed in the Attainment Demonstration SIPs?

In addition to the modeling analysis and WOE support demonstrating attainment, the EPA has identified the following key elements which must be present in order for EPA to approve the 1-hour attainment demonstration SIPs. These elements are listed below and then described in detail.

*Clean Air Act measures, and other measures relied on in the modeled attainment demonstration SIP.* This includes adopted and submitted rules for all previously required Clean Air Act mandated measures for the specific area classification. This also includes measures that may not be required for the area classification but that the State relied on in the SIP submission for attainment and ROP plans on which EPA is proposing to take action today.

*NO<sub>x</sub> Reductions Affecting Boundary Conditions.*

*Motor vehicle emissions budget.* This must be a motor vehicle emissions budget which can be determined by EPA to be adequate for conformity purposes.

*Mid-course review.* An enforceable commitment to conduct a mid-course review and evaluation based on air quality and emission trends must be included in the attainment demonstration SIP before it can be approved by the EPA. The mid-course review would show whether the adopted control measures are sufficient to reach attainment by the area's attainment date, or that additional control measures are necessary.

<sup>6</sup>The initial, "ramp-up" days for each episode are excluded from this determination.

### 1. Clean Air Act Measures and Measures Relied on in the Modeled Attainment Demonstration SIP

The States should have adopted the control measures already required under the Clean Air Act for the area classification. Since these 10 serious and severe areas need to achieve substantial reductions from their 1990 emissions levels in order to attain, EPA anticipates that these areas need all of the measures required under the Clean Air Act to attain the 1-hour ozone NAAQS.

In addition, the States may have included control measures in its attainment strategy that are in addition to measures required in the Clean Air Act. (For serious areas, these should have already been identified and adopted, whereas severe areas have until December 2000 to submit measures to achieve ROP through the attainment year and to attain.) For purposes of fully approving the State's SIP, the State will need to adopt and submit all VOC and NO<sub>x</sub> controls within the local modeling domain that were relied on for purposes of the modeled attainment demonstration.

The following table presents a summary of the Clean Air Act requirements that need to be met for each severe nonattainment area for the 1-hour ozone NAAQS. These requirements are specified in section 182 of the Clean Air Act. Information on more measures that States may have adopted or relied on in their current SIP submissions is not shown in the table.

#### CAA REQUIREMENTS FOR SEVERE AREAS

- 
- NSR for VOC and NO<sub>x</sub>, including an offset ratio of 1.3:1 and a major VOC and NO<sub>x</sub> source cutoff of 25 tons per year (tpy)
  - Reasonable Available Control Technology (RACT) for VOC and NO<sub>x</sub>
  - Enhanced Inspection and Maintenance (I/M) program
  - 15% VOC plans for ROP through 1996
  - Emissions inventory
  - Emission statements
  - Attainment demonstration
  - 9% ROP plan through 1999
  - Clean fuels program
  - Enhanced monitoring (PAMS)
  - Stage II vapor recovery
  - Reformulated gasoline
  - 9% ROP plan through attainment year (post-1999)
  - Measures to offset Vehicle Miles Travelled (VMT) growth
  - Requirements for fees for major sources for failure to attain
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### 2. NO<sub>x</sub> Reductions Consistent With the Modeling Demonstration

The EPA completed final rulemaking on the NO<sub>x</sub> SIP call on October 27, 1998, which required States to address transport of NO<sub>x</sub> and ozone to other States. To address transport, the NO<sub>x</sub> SIP call established emissions budgets for NO<sub>x</sub> that 22 jurisdictions were required to meet through enforceable SIP measures adopted and submitted by September 30, 1999. The NO<sub>x</sub> SIP call is intended to reduce emissions in upwind States that significantly contribute to nonattainment problems. The EPA did not identify specific sources that the States must regulate nor did EPA limit the States' choices regarding where to achieve the emission reductions. Subsequently, a three-judge panel of the Court of Appeals for the District of Columbia Circuit issued an order staying the SIP submission requirement portion of the NO<sub>x</sub> SIP call rule requiring States to submit rules by September 30, 1999.

The NO<sub>x</sub> SIP call rule establishes budgets for the States in which 9 of the nonattainment areas for which EPA is proposing action today are located. The 9 areas are: Greater Connecticut, Springfield, MA, New York/North New Jersey/Long Island (NY-NJ-CT), Baltimore, MD, Philadelphia/Wilmington/Trenton (PA-NJ-DE-MD), Metropolitan Washington, DC (DC-MD-VA), Atlanta, GA, Milwaukee-Racine WI, and Chicago-Gary-Lake County (IL-IN).

Emission reductions that will be achieved through EPA's NO<sub>x</sub> SIP call will reduce the levels of ozone and ozone precursors entering nonattainment areas at their boundaries. For purposes of developing attainment demonstrations, States define local modeling domains that include both the nonattainment area and nearby surrounding areas. The ozone levels at the boundary of the local modeling domain are reflected in modeled attainment demonstrations and are referred to as boundary conditions. With the exception of Houston, the 1-hour attainment demonstrations on which EPA is proposing action have relied, in part, on the NO<sub>x</sub> SIP call reductions for purposes of determining the boundary conditions of the modeling domain. Emission reductions assumed in the attainment demonstrations are modeled to occur both within the State and in upwind States. Thus, intrastate reductions as well as reductions in other States impact the boundary conditions. Although the court has indefinitely stayed the SIP submission deadline, the NO<sub>x</sub> SIP Call rule remains in effect. Therefore, EPA believes it is appropriate to allow States to continue to assume the reductions from the NO<sub>x</sub> SIP call in

areas outside the local 1-hour modeling domains. If States assume control levels and emission reductions other than those of the NO<sub>x</sub> SIP call within their States but outside of the modeling domains, the States must also adopt control measures to achieve those reductions in order to have an approvable plan.

Accordingly, States in which the nonattainment areas are located will not be required to adopt measures outside the modeling domain to achieve the NO<sub>x</sub> SIP call budgets prior to the time that all States are required to comply with the NO<sub>x</sub> SIP call. If the reductions from the NO<sub>x</sub> SIP call do not occur as planned, States will need to revise their SIPs to add additional local measures or obtain interstate reductions, or both, in order to provide sufficient reductions needed for attainment.

As provided in section 1 above, any controls assumed by State inside the local modeling domain<sup>7</sup> must be adopted as part of the State's 1-hour attainment demonstration SIP. It is only for NO<sub>x</sub> emission reductions occurring outside of the local modeling domain that States may assume implementation of the NO<sub>x</sub> SIP call measures and the resulting boundary conditions without actually being required at this time to adopt regulations to implement the NO<sub>x</sub> emission reductions required by the NO<sub>x</sub> SIP call.

### 3. Motor Vehicle Emissions Budget

The EPA believes that an attainment demonstration SIP must necessarily estimate the motor vehicle emissions that will be produced in the attainment year and must demonstrate that this emissions level, when considered with emissions from all other sources, is consistent with attainment. The estimate of motor vehicle emissions is used to determine the conformity of transportation plans and programs to the SIP, as described by Clean Air Act section 176(c)(2)(A). For transportation conformity purposes, the estimate of motor vehicle emissions is known as the motor vehicle emissions budget. The EPA believes that an appropriately identified motor vehicle emissions budget is a necessary part of an attainment demonstration SIP. A SIP cannot effectively demonstrate

<sup>7</sup>For the purposes of this notice, "local modeling domain" is typically an urban scale domain with horizontal dimensions less than about 300 km on a side, horizontal grid resolution less than or equal to 5 x 5 km or finer. The domain is large enough to ensure that emissions occurring at 8 am in the domain's center are still within the domain at 8 pm the same day. If recirculation of the nonattainment area's previous day's emissions is believed to contribute to an observed problem, the domain is large enough to characterize this.

attainment unless it identifies the level of motor vehicle emissions that can be produced while still demonstrating attainment.

The EPA has determined that, except for the Western MA (Springfield) attainment demonstration SIP, the motor vehicle emission budgets for the 9 other nonattainment areas covered in today's proposals are inadequate or missing from the attainment demonstrations. Therefore, EPA is proposing to disapprove the attainment demonstration SIPs for those 9 areas if the States do not submit motor vehicle emissions budgets that EPA can find adequate by May 31, 2000.<sup>8</sup> In order for EPA to complete the adequacy process by the end of May, States should submit an emissions budget no later than December 31, 1999.<sup>9</sup> If an area does not have a motor vehicle emissions budget that EPA can determine adequate for conformity purposes by May 31, 2000, EPA plans to take final action at that time disapproving in full or in part the area's attainment demonstration. The emissions budget should reflect all of the motor vehicle control measures contained in the attainment demonstration, *i.e.*, measures already adopted for the nonattainment area as well as those yet to be adopted.

4. Mid-Course Review

A mid-course review (MCR) is a reassessment of modeling analyses and more recent monitoring and emissions data to determine if a prescribed control strategy is resulting in emission reductions and air quality

improvements needed to attain the ambient air quality standard for ozone as expeditiously as practicable but no later than the statutory attainment dates.

The EPA believes that a commitment to perform a MCR is a critical element of the WOE determination for the attainment demonstration on which EPA is proposing to take action today. In order to approve the Indiana attainment demonstration SIP for the Chicago-Gary-Lake County area, EPA believes that Indiana must submit an enforceable commitment to perform a MCR as described here.<sup>10</sup>

As part of the commitment, the State should commit to work with EPA in a public consultative process to develop a methodology for performing the MCR and developing the criteria by which adequate progress would be judged.

For severe areas, such as the Chicago-Gary-Lake County ozone nonattainment area, the States must submit an enforceable commitment to perform the MCR immediately following the 2003 ozone season and to submit the results to EPA by December 31, 2003. EPA believes that an analysis in 2003 would be most robust since some or all of the regional NO<sub>x</sub> emission reductions should be achieved by that date. EPA would then review the results and determine whether any States need to adopt and submit additional control measures for purposes of attainment. The EPA is not requesting that States commit now to adopt new control measures as a result of this process. It would be impracticable for the States to make a commitment that is specific

enough to be considered enforceable. Moreover, the MCR could indicate that upwind States may need to adopt some or all of the additional controls needed to ensure that an area attains the standard. Therefore, if EPA determines that additional control measures are needed for attainment, EPA would determine whether additional emission reductions are needed in the States in which the nonattainment areas are located or in upwind States, or in both. The EPA would require the affected State or States to adopt and submit new measures within a period specified at that time. The EPA anticipates that these findings would be made as calls for SIP revisions under section 110(k)(5) and, therefore, the period for submission of the measures would be no longer than 18 months after the EPA finding. A draft guidance document regarding the MCR process is located in the docket for this proposal and may also be found on EPA's web site at <http://www.epa.gov/ttn/scram/>.

*D. Additional Background Considerations for This Proposed Rulemaking*

What Information Does the EPA Expect To Receive From the States To Allow an Approval of the 1-hour Ozone Attainment Demonstration SIPs?

The following table shows a summary of information on what EPA expects from Indiana to allow EPA to approve the severe area 1-hour ozone attainment demonstration SIP for the Chicago-Gary-Lake County nonattainment area.

SUMMARY SCHEDULE OF FUTURE STATE ACTIONS—SEVERE NONATTAINMENT AREAS THAT WILL SUBMIT ALL MEASURES NEEDED FOR ATTAINMENT BY 12/31/00

Required no later than:	Action
12/31/99 .....	State submits the following to EPA: —Motor vehicle emissions budget. <sup>1</sup> —Enforceable commitment to perform a mid-course review.
4/15/00 .....	State submits— —The final motor vehicle emissions budget (only if draft submitted earlier). <sup>2</sup> —Enforceable commitment (only if draft submitted earlier) to perform a mid-course review (only if draft submitted earlier).
12/31/00 .....	—State submits a revised/final modeling analysis. —State submits adopted rules that reflect measures relied on in modeled attainment demonstration and that support ROP requirements. —State revises & submits SIP & motor vehicle emissions budget if adopted measures are for motor vehicle category.

<sup>8</sup>For severe areas, EPA will determine the adequacy of the emissions budgets associated with the post-1999 ROP plans once the States submit the target calculations, which are due no later than December 2000.

<sup>9</sup>A final budget is preferred; but, if the State public process is not yet complete, then a draft budget may be submitted. The adequacy process

generally takes at least 90 days. Therefore, in order for EPA to complete the adequacy process no later than the end of May, EPA must have by February 15, 2000, the final budget or a draft that is substantially similar to what the final budget will be. The State must submit the final budget by April 15, 2000.

<sup>10</sup>For purposes of conformity, the State needs a commitment that has been subject to a public hearing. If the State has submitted a commitment that has been subject to public hearing and that provides for the adoption of all measures necessary for attainment, the State should submit a letter prior to December 31, 1999, amending the commitment to include the MCR.

## SUMMARY SCHEDULE OF FUTURE STATE ACTIONS—SEVERE NONATTAINMENT AREAS THAT WILL SUBMIT ALL MEASURES NEEDED FOR ATTAINMENT BY 12/31/00—Continued

Required no later than:	Action
12/31/03 .....	State submits to EPA results of mid-course review.

<sup>1</sup> Final budget preferable; however, if public process is not yet complete, then a draft budget may be submitted at this time. Note that the budget can reflect estimated Tier 2 emission reductions—see memorandum from Lydia Wegman and Merrylin Zaw-Mon, “1-Hour Ozone Attainment Demonstrations and Tier 2/Sulfur Rulemaking.”

<sup>2</sup> If a final budget is significantly different from the draft submitted earlier, the final budget must be submitted by 2/15/00 to accommodate the 90 day processing period prior to the 5/31/00 date by which EPA must find the motor vehicle emissions budget adequate.

### What Are the Relevant Policy and Guidance Documents?

This proposal has cited several policy and guidance memoranda. The EPA has also developed several technical documents related to the rulemaking action in this proposal. Some of the documents have been referenced above. The documents and their location on EPA's web site are listed below; these documents will also be placed in the docket for this proposal action.

#### Recent Documents

1. “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. November 1999. Web site: <http://www.epa.gov/ttn/scram/>.

2. “Serious and Severe Ozone Nonattainment Areas: Information on Emissions, Control Measures Adopted or Planned and Other Available Control Measures.” Draft Report. November 3, 1999. Ozone Policy and Strategies Group. U.S. EPA, RTP, NC.

3. Memorandum, “Guidance on Motor Vehicle Emissions Budgets in 1-hour Attainment Demonstrations,” from Merrylin Zaw-Mon, Office of Mobile Sources to Air Division Directors, Regions I–VI, November 3, 1999. Web site: <http://www.epa.gov/oms/transp/traqconf.htm>.

4. Memorandum, “1-Hour Ozone Attainment Demonstrations and Tier 2/Sulfur/Sulfur Rulemaking,” from Lydia Wegman and Merrylin Zaw-Mon to the Air Division Directors, Regions I–VI, November 8, 1999. Web site: <http://www.epa.gov/oms/transp/traqconf.htm>.

5. Draft Memorandum, “1-Hour Ozone NAAQS—Mid-Course Review Guidance.” From John Seitz, Director, Office of Air Quality Planning and Standards. Web site: <http://www.epa.gov/ttn/scram/>.

#### Previous Documents

1. U.S. EPA, (1991), Guideline for Regulatory Application of the Urban Airshed Model, EPA-450/4-91-013, (July 1991). Web site: <http://www.epa.gov/ttn/scram/> (file name: “UAMREG”).

2. U.S. EPA, (1996), Guidance on Use of Modeled Results to Demonstrate Attainment of the Ozone NAAQS, EPA-454/B-95-007, (June 1996). Web site: <http://www.epa.gov/ttn/scram/> (file name: “O3TEST”).

3. Memorandum, “Ozone Attainment Demonstrations,” from Mary D. Nichols, issued March 2, 1995. Web site: <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

4. Memorandum, “Extension of Attainment Dates for Downwind Transport Areas,” issued July 16, 1998. Web site: <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

5. December 29, 1997 Memorandum from Richard Wilson, Acting Assistant Administrator for Air and Radiation “Guidance for Implementing the 1-Hour Ozone and Pre-Existing PM<sub>10</sub> NAAQS.” Web site: <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

### II. Technical Review of the Submittal

#### A. Summary of State Submittals

##### 1. General Information

When Was the Attainment Demonstration Addressed in Public Hearings, and When was the Attainment Demonstration Submitted by the State of Indiana?

The State held a public hearing on the ozone attainment demonstration on April 6, 1998 and submitted to it EPA on April 30, 1998.

What Are the Basic Components of the Submittal?

Since Indiana, along with Illinois, Michigan, and Wisconsin, participated in the Lake Michigan Ozone Study and the Lake Michigan Ozone Control Program, and since these ozone modeling studies form the technical basis for the ozone attainment demonstration, Illinois, Indiana, and Wisconsin centered their ozone attainment demonstrations around a

single technical support document (April 1998) produced by the four States in the Lake Michigan Air Directors Consortium (LADCO). This technical support document is entitled “Modeling Analysis for 1-Hour Ozone NAAQS in the Lake Michigan Area.” Each State has also included a state-specific cover letter and state-specific synopsis of the ozone attainment demonstration. It should be noted that the specifics of the emission control strategies considered varied by State. The specific emission categories or emission controls considered by Indiana are summarized below.

##### 2. Modeling Procedures and Basic Input Data

What Modeling Approach Was Used in the Analyses?

All three States, as members of LADCO and as participants in the Lake Michigan Ozone Study and Lake Michigan Ozone Control Program, used the same ozone modeling approach. The modeling approach is documented in an April 1998 technical support document, entitled “Modeling Analysis For 1-Hour Ozone NAAQS In The Lake Michigan Area.” Since the April 1998 technical support document failed to document all of the modeling approaches and bases for the development and selection of model input data, this review also relies on an older, December 1995, technical support document submitted by the LADCO States, which does a more thorough job of documenting the system and input data.

The heart of the modeling system and approach is the Urban Airshed Model—Version V (UAM-V) developed originally for application in the Lake Michigan area. This photochemical model was used to model ozone and ozone precursors in a multiple, nested grid system. In the horizontal dimension, three nested grids were used. Grid A, the largest of the three grids, is a 35 cell by 50 cell grid (560 kilometers east-west by 800 kilometers north-south) generally centered on the lower two-thirds of Lake Michigan with a horizontal resolution of 16 kilometers per cell. Grid B is a 34 cell by 60 cell

grid (272 kilometers east-west by 480 kilometers north-south) centered on the lower three-quarters of Lake Michigan with a horizontal resolution of 8 kilometers per cell. Grid B covers all of the 1-hour ozone nonattainment areas of interest in the analysis. Grid C is a 20 cell by 80 cell grid (80 kilometers east-west by 320 kilometers north-south) approximately centered on the western shoreline of lower Lake Michigan with a horizontal resolution of 4 kilometers per cell. The model covered 8 vertical layers over the entire horizontal modeling domain. Mixing heights used in the modeling system were determined from regional upper-air monitoring station data.

Besides being able to model ozone and other pollutants in nested horizontal grids, UAM-V can also model individual elevated source plumes within the modeling grid (plume-in-grid or PiG). Gaussian dispersion models are used to grow plumes until the plumes essentially filled grid cells. At these points, the numerical dispersion and advection components of UAM take over to address further downwind dispersion and advection.

The UAM-V modeling system is also used to assess the impacts of clouds on certain high ozone episode days. Observed cloud data are used to modify chemical photolysis rates and other meteorological input data.

The following input data systems and analyses were also used as part of the combined modeling system for the Lake Michigan area:

a. *Emissions.* UAM-V requires the input of gridded, hourly estimates of CO, NO<sub>x</sub>, and speciated VOC emissions (speciated based on carbon bond types). The States provided emission inventories, which were processed through the Emissions Modeling System—1995 version (EMS-95) to prepare UAM-V input data files. Emission data files were generated for Grid A and Grid B.

For Grid B, the States supplied point source (individually identified stationary sources) and area source (sources too small and numerous to be identified and recorded as individual sources) emissions for a typical summer weekday. These emissions were based on the States' 1990 base year emissions inventories for the ozone nonattainment areas and were adjusted to 1991 levels to be compatible with the high ozone periods modeled. The base emissions were adjusted for some source categories to reflect typical "hot summer days." Day-specific emissions data were supplied by over 200 facilities in the modeling domain. Mobile source

emissions were calculated by EMS-95 using MOBILE5a (a mobile source emissions model supplied by the EPA) emission factors (using day-specific temperatures) and local vehicle-miles-traveled data generally supplied by local metropolitan planning agencies and based on transportation models. Finally, the biogenic emission rates used in Grid B were calculated based on BIOME, which is the biogenics emissions model contained within EMS-95.

For Grid A, point and area anthropogenic emissions rates were derived from EPA's 1990 Interim Regional Inventory, except for Wisconsin, which supplied state-specific data. Mobile source emissions were based on MOBILE5a emission factors (derived for a representative hot summer day) and vehicle miles traveled data derived using the 1990 Highway Performance Monitoring System. Biogenic emission rates were calculated using the Biogenics Emissions Inventory System (BEIS) assuming temperatures for a representative, hot summer day. This version of BEIS includes soil NO<sub>x</sub> emissions and land use data from the United States Geological Survey.

Grid B emissions data superceded Grid A data within Grid B. Grid C emissions data were not specifically derived—Grid B emissions data were used within Grid C.

All emission estimates were speciated by compound or carbon bond type and spatially, and temporally resolved into UAM-V input data files by the use of EMS-95.

b. *Meteorology.* Meteorological input data by grid cell and hour were generated by use of a prognostic meteorological model (model output data derived from equations which describe how meteorological variables, such as wind speed/direction, temperature, and water vapor change over time) known as CALRAMS. CALRAMS was run with varying horizontal resolution depending on location. Over Grids B and C, CALRAMS was run with 4 kilometer resolution. Over Grid A, a resolution of 16 kilometers was used. Over the remainder of the continental United States, a resolution of 80 kilometers was used. The model's vertical structure used 31 layers in Grid A and over the remainder of the continental United States outside of the UAM-V modeling domain and 26 layers over Grids B and C.

Four-dimensional data assimilation using observed meteorological data values was used to ensure that the model estimates did not deviate significantly from observed meteorological data. Preprocessor

programs were used to map the model's output data into the UAM-V grid system and to derive other necessary model inputs.

Some adjustments were made to CALRAMS results where the model produced near-calm wind speeds and where observed wind speeds were significantly higher than modeled wind speeds during one modeled ozone episode.

c. *Chemistry.* Atmospheric chemistry within the modeling grid system and UAM-V was simulated using the Carbon Bond-Version IV model developed by the Environmental Protection Agency and used in Version IV of UAM.

d. *Boundary and Initial Conditions.* Initial sensitivity analyses of the modeling system's response to modeling domain boundary conditions (incoming ozone and ozone precursor levels at the outer edges of the modeling domain) showed that the system was very sensitive to these boundary conditions. LADCO used all available upwind data, and especially those collected during the 1991 intensive field study, to derive boundary conditions. In addition, the contractor, SAI, Incorporated, used output data from the use of the Regional Oxidant Model (ROM) to derive initial concentrations in the modeling domain for the first day of each modeled ozone episode. Data from this first day, along with other model input data, were used to model ozone and precursor concentrations for the next 1 to 2 days, to be used as inputs into the main part of the modeled ozone episode. The first 1 to 2 days modeled were treated as "ramp-up days" for the main part of each modeled ozone episode. This process produced more stable input data for the modeling of high ozone days.

What High Ozone Periods Were Modeled?

Four high ozone episodes in 1991 were considered. These episodes were:

June 18–21, 1991;

June 24–28, 1991;

July 15–19, 1991; and

August 22–26, 1991.

The 1991 ozone episodes were selected as the focus of the modeling analyses because the summer of 1991 was a relatively conducive period for ozone formation, and, most importantly, because LADCO conducted an intensive field study during that summer to collect data needed to support the modeling study.



### What Procedures and Sources of Projection Data Were Used To Project the Emissions to Future Years?

The future year emission inventories used in the Lake Michigan Ozone Control Program and ozone attainment demonstration were derived from the Lake Michigan Ozone Study base year regional inventory (discussed above). Three adjustments were made to the base year emissions inventory to generate the future year emission inventories. First, a baseline inventory was prepared by replacing the day-specific emissions with typical hot summer day emissions for point sources. Emissions for other source categories were simply carried over to the baseline inventory. Second, the baseline emissions inventory was projected to 2007 (the attainment year for severe ozone nonattainment areas) by applying scalar growth factors. Finally, the projected baseline emission inventories were reduced to reflect the implementation of various emission control measures expected or required to occur by those years.

The growth factors used in the projection of emissions for each source sector are as follows:

- a. *Point Sources.*
  - i. For electric utilities—company-specific data were provided by each State;
  - ii. For certain individual point sources—a growth factor of “0” was used to reflect the shutdown of these sources;
  - iii. For all remaining point source emission categories—growth factors based on the EPA Economic Growth Analysis System (EGAS) were used;
- b. *Area Sources.*
  - i. For baseline emission estimates based on population—projected populations were used to recalculate emissions;
  - ii. For gasoline marketing source categories—projected emissions were based on projected gasoline sales;
  - iii. For other area source emission categories—projections were based on EGAS estimates (some EGAS estimates were judged to be inappropriate and alternative surrogates were used to estimate future emissions);
- c. *Mobile Sources.* Vehicle miles traveled projections were based on transportation modeling for northeast Illinois, northwest Indiana, and southeast Wisconsin, and on State-supplied growth factors for the rest of the ozone modeling domain; and
- d. *Biogenic Sources.* No growth was assumed.

To account for emission changes resulting from various emission controls (these emission controls also affect projected emissions), the States tested

several emission control strategies. Emission reduction scalars were developed to reflect the expected or required emission reduction levels, rule penetration (accounting for the percentage of source category emissions affected by the emission reduction requirements), and rule effectiveness (some source control rules do not fully achieve the emission reductions expected due to control device failure, human error, or other factors). The base component of these control strategies were the emission reductions resulting from the controls mandated by the Clean Air Act and expected to be in place by 2007. These emission controls are further discussed below.

### How Were the Emissions, Air Quality, and Meteorological Input Data Quality Assured?

*Emissions.* The Lake Michigan States' quality assurance of the emissions data focused on the comprehensiveness and reasonableness of the emissions data rather than on precision and accuracy of the data. During the initial development of the regional emissions inventory, internal quality control activities included the preparation and implementation of quality assurance plans for the derivation of emission estimates by each State and for the development and application of the EMS-95 emissions software. External quality assurance activities included: (1) Audits of the point and area source data inputs; (2) review of the EMS-95 output; and (3) independent testing of the EMS-95 model source code. The State emission estimates were compared against each other to assess their completeness, consistency, and reasonableness.

Several approaches were used to compare the emission estimates against ambient measurements. These included: (1) Comparisons of ambient to emissions-based ratios of non-methane organic compounds to oxides of nitrogen; (2) comparisons of ambient to emissions-based ratios of carbon monoxide to oxides of nitrogen; (3) receptor modeling (determining individual source shares of monitored pollutant concentrations based on source-specific emission profiles and temporal and spatial statistical analyses of monitored pollutant species); and (4) comparisons of ambient to model-based ratios of non-methane organic compounds to oxides of nitrogen. The comparison of the measurement-based pollutant ratios with the emissions inventory-based pollutant ratios showed good agreement between the emissions inventory and the ambient data. The receptor modeling results also generally

supported the validity of the emissions inventory.

*Air Quality and Meteorological Data.* Validation of the 1991 Lake Michigan Ozone Study field data (the data used as input to the meteorological and photochemical dispersion models and used to validate the models' outputs) was performed by the Lake Michigan Ozone Study Data Management and Data Analysis Contractors. The data were validated using a number of statistical analyses. Three levels of validation were used, depending on the intended use of the data. The three levels of data validation were:

- a. *Level 1.* This validation was performed by the group collecting the data. This group: flagged suspect data values; verified the data contained in computer data files against input data sheets; eliminated invalid measurements; replaced suspect data with data from back-up data acquisition systems; and adjusted measurement values to eliminate quantifiable calibration and interference biases;
- b. *Level 2.* This validation was performed on data assembled in a master data base. The level of data validation involved various consistency checks between data values within the data base, including: comparison of data from closely located sites collected at approximately the same time; comparison of data from co-located sampling systems; comparisons based on physical relationships; and special statistical analyses of the VOC and carbonyl data; and
- c. *Level 3.* This validation was performed by the Lake Michigan Ozone Study Data Analysis Contractor and was performed as part of the data interpretation process. This validation included identification of unusual data values (e.g. extreme values, values which fail to track the values of other associated data in a time series, or those values which did not appear to fit the general and spatial or temporal overall pattern).

As a result of the data validation, several changes were made to the meteorological and air quality input data. Volume III (December 1995) of the Lake Michigan Ozone Study/Lake Michigan Ozone Control Program Project Report documents all of the data changes resulting from the data validation efforts.

### 3. Modeling Results

#### How Did the States Validate the Photochemical Modeling Results?

A protocol document outlining the operational and scientific evaluation of the modeling system was prepared by

LADCO, and was approved by the Environmental Protection Agency on March 6, 1992. The evaluation of the photochemical model consisted of seven steps:

- a. Evaluation of the scientific formulation of the model by the Photochemical Modeling Contractor;
- b. Assessment of the fidelity of the computer codes to scientific-formulation, governing equations, and numerical solution procedures performed by an independent contractor (independent of the Photochemical Modeling Contractor);
- c. Evaluation of the predictive performance of the individual modeling process modules and preprocessor modules to identify possible flaws or systematic biases;
- d. Evaluation of the full model's predictive performance against statistical performance tests and performance criteria specified by the EPA (see discussion of the model's performance for specific days modeled below);
- e. Performance of sensitivity tests to assure conformance of the model with known or expected model behavior;
- f. Performance of comparative modeling analyses, comparing the results from the use of UAM-V with similar results from the use of UAM-IV (the photochemical model generally recommended by the Environmental Protection Agency); and
- g. Implementation of quality control and quality assurance activities, including: (i) Benchmark modeling; (ii) pre-established file structuring; (iii) duplicative modeling; (iv) modeling procedure and results documentation; and (v) external review of modeling results.

Numerous modeling runs and overall system evaluations were conducted to carry out these validation procedures.

**What Were the Results of the Model Performance Evaluations for the Modeling System Used in the Attainment Demonstration?**

The following highlights the results of the operational and scientific evaluation of the modeling system. These results are discussed in detail in many documents generated by LADCO and supplied to the Environmental Protection Agency:

- a. Many modeling runs and evaluations of output data were made to derive statistical results indicative of the modeling system's overall performance. Statistical data, such as: observed peak ozone concentrations versus peak predicted concentrations; unpaired peak concentration accuracy; bias in peak concentrations and overall system bias; and gross system error, were compared to acceptable system criteria specified by the EPA (*Guideline for Regulatory Application of the Airshed Model*, EPA-450/4-91-013, July 1991). The statistical accuracy results for the modeling system comply with the EPA performance criteria;
- b. The spatial and temporal representation of the surface ozone concentrations are reasonable both region-wide and in the areas of high concentrations. Broad areas of high ozone concentrations were reproduced successfully and magnitude and times of peak ozone concentrations reasonably matched those observed;
- c. Model performance across the full modeling domain was consistent with model performance in individual subregions. This further supports the credibility of the modeling system;
- d. Predicted aloft downwind ozone concentrations compare favorably with airborne/aircraft monitored ozone concentrations. This supports the three-dimensional validity of the modeling system; and

e. Model performance for ozone precursors, especially for NO<sub>x</sub>, was very good. This further supports the validity of the use of the model to evaluate the impacts on ozone due to changes in precursor emissions and the testing of the emission control strategy scenarios.

Based on the model performance evaluation results, the EPA approved the validity of the modeling system and its use for control strategy evaluations on December 15, 1994 (letter from John Seitz, Director of the Office of Air Quality Planning and Standards to Lake Michigan Air Directors Consortium).

**What Were the Ozone Modeling Results for the Base Period and for the Future Attainment Period?**

Many modeling runs were conducted, producing millions of model output data. What is summarized in Tables 1 and 2 are the observed and modeled peak ozone concentrations for the selected ozone episode days for two considered emission control strategies. Please note that the ozone control strategy covered by each table is further discussed below.

The ozone modeling system was run to simulate ozone concentrations on selected high ozone days for the base year and future year (2007). The future year simulations covered five boundary condition scenarios, corresponding to base year boundary conditions, and to the reduction of peak boundary ozone levels to 85, 80, 70, and 60 parts per billion (ppb), 1-hour average. The future year simulations also covered two emission control strategy sets, Strategy 2 and Strategy 4.

The resulting domain-wide modeled peak ozone concentrations for Strategy 2 are given in Table 1. Similarly, the resulting domain-wide modeled peak ozone concentrations for Strategy 4 are given in Table 2.

**TABLE 1.—LAKE MICHIGAN OZONE CONTROL PROGRAM STRATEGY 2 OZONE MODELING RESULTS**  
[Domain-wide Peak Ozone Concentrations, ppb]

1991 Date	1991 OBS	1991 MOD	2007 BY BC	2007 85 ppb	2007 80 ppb	2007 70 ppb	2007 60 ppb
June 26 .....	175	165	141	134	133	128	122
June 27 .....	118	152	130	123	122	119	114
June 28 .....	138	142	123	118	118	116	109
June 20 .....	152	137	123	121	121	120	120
June 21 .....	134	126	—	—	—	—	114
July 17 .....	145	148	133	126	124	120	113
July 18 .....	170	162	146	135	135	128	119
July 19 .....	170	161	145	137	137	129	119
Aug 25 .....	148	128	126	121	120	116	109
Aug 26 .....	189	158	142	135	131	124	115

OBS = Observed Peak Ozone Concentration.  
 MOD = Modeled Base Year Peak Ozone Concentration.  
 BY BC = Base Year Boundary Conditions.  
 85 ppb, 80 ppb, 70 ppb, 60 ppb = Future Year Peak Ozone Boundary Concentrations.

TABLE 2.—LAKE MICHIGAN OZONE CONTROL PROGRAM STRATEGY 4 OZONE MODELING RESULTS  
[Domain-wide Peak Ozone Concentrations, ppb]

1991 Date	1991 OBS	1991 MOD	2007 BY BC	2007 85 ppb	2007 80 ppb	2007 70 ppb	2007 60 ppb
June 26 .....	175	165	137	130	129	124	117
June 27 .....	118	152	125	117	117	114	109
June 28 .....	138	142	119	114	114	112	104
June 20 .....	152	137	117	117	117	117	116
June 21 .....	134	126	121	118	117	115	110
July 17 .....	145	148	132	123	121	116	110
July 18 .....	170	162	141	131	129	123	115
July 19 .....	170	161	140	131	129	123	114
Aug 25 .....	148	128	125	120	119	115	108
Aug 26 .....	189	158	139	133	129	122	113

OBS = Observed Peak Ozone Concentration.

MOD = Modeled Base Year Peak Ozone Concentration.

BY BC = Base Year Boundary Conditions.

85 ppb, 80 ppb, 70 ppb, 60 ppb = Future Year Peak Ozone Boundary Concentrations.

#### Do the Modeling Results Demonstrate Attainment of the Ozone Standard?

The modeling of the Strategy 2 and Strategy 4 impacts by themselves (the 2007 BY BC columns in Tables 1 and 2) does not demonstrate attainment. The modeling supports the need for significant reductions in background ozone and ozone precursor concentrations. In addition, the model indicates the potential for ozone exceedances or ozone standard violations under the scenarios of smaller reductions in background ozone levels. Nonetheless, when considered along with a WOE determination, as discussed below, the EPA believes that the modeling results do support a conclusion that local VOC emission reductions combined with possible transported ozone reductions can lead to attainment of the 1-hour ozone standard in the Chicago-Gary-Lake County ozone nonattainment area and its downwind environs.

#### Does the Attainment Demonstration Depend on Future Reductions of Regional Emissions?

As noted in the tables summarizing the peak modeled ozone concentrations above and in the discussion elsewhere in this proposed rulemaking, the States considered emission control strategies which by themselves would not achieve attainment of the 1-hour ozone standard. The States, however, also show that, with a significant reduction in background ozone concentrations expected to result from the implementation of regional NO<sub>x</sub> emission controls under the NO<sub>x</sub> state implementation plan call, attainment of the standard can be achieved using the control strategies considered. Strategy 2 can lead to attainment of the ozone standard with a future reduction in peak ozone background concentrations down

to 70 ppb. Strategy 4 can lead to attainment if peak background ozone concentrations are reduced to 80 ppb. LADCO documents that these future ozone background concentration levels may be obtained through the implementation of the NO<sub>x</sub> SIP call.

It should be noted that LADCO not only considered lowered background ozone concentrations resulting from regional upwind emission controls, they also considered reductions in background ozone precursor concentrations. The States used various analyses to estimate the reductions in background ozone precursor concentrations associated with the assumed reductions in background ozone concentrations. This was primarily accomplished by considering available modeling data from OTAG.

The following two step process was used to determine which of the tested boundary conditions correspond best to the boundary conditions that would be expected under the EPA NO<sub>x</sub> SIP call:

a. The NO<sub>x</sub> emissions of the OTAG modeling domain were compared to the regional NO<sub>x</sub> emissions expected under the NO<sub>x</sub> SIP call. Several emission control strategies considered in the OTAG process were assessed. It is noted that the attainment demonstration's NO<sub>x</sub> emissions fall between OTAG emission control strategy runs C and H; and

b. The boundary ozone concentration changes resulting from the selected OTAG strategy runs were then compared to the ozone boundary changes considered in the Lake Michigan Ozone Control Program modeling runs. The reduction of peak background ozone levels down to 70 ppb in the Lake Michigan Ozone Control Program was found to correspond best with the expected ozone changes considered under the

selected OTAG emission control strategy runs C through H.

Based on this approach, it is assumed that the NO<sub>x</sub> SIP call would reduce peak background ozone levels to 70 ppb.

#### 4. Application of Attainment Test and the Attainment Demonstration

##### What Approach Was Used To Demonstrate Attainment of the Ozone Standard?

To assess attainment of the 1-hour ozone standard, LADCO applied 2 approaches to review the results of emission control strategy modeling, supplementing them with modeling results from the OTAG process. First, the States considered the modeling results through the use of a deterministic approach, and second, the States considered a statistical approach.

a. *Deterministic Approach.* The deterministic approach to ozone attainment demonstrations, as defined in the *Guidance on the Use of Modeled Results to Demonstrate Attainment of the Ozone NAAQS* (June 1996), requires the daily peak 1-hour ozone concentrations modeled for every grid cell (in the surface level) to be at or below the ozone standard for all days modeled. If there are modeled ozone standard exceedances in only a few grid cells on a limited number of days, this approach can still be used to demonstrate attainment of the ozone standard through the use of weight of evidence determinations.

The States note that the deterministic test is passed for:

i. Strategy 2 with future (2007) ozone boundary concentrations capped at 60 ppb; or

ii. Strategy 4 with future ozone boundary concentrations capped at 70 ppb.

Note that Strategy 2 with a future ozone boundary concentration of 70 ppb

or Strategy 4 with a future ozone boundary concentration of 80 ppb produces peak ozone concentrations that may demonstrate attainment given the supporting weight of evidence analysis. The modeling results for other Strategy 2 and Strategy 4 scenarios with higher ozone boundary concentrations, however, do not appear to be close enough to the standard to warrant the consideration of weight of evidence.

b. *Statistical Approach.* The States note that the statistical approach permits occasional ozone standard exceedances and reflects an approach comparable to the form of the 1-hour ozone standard. Therefore, the States have also given this approach some attention.

Under the statistical approach, there are three benchmarks related to the frequency and magnitude of allowed exceedances and the minimum level of air quality improvement after emission controls are applied. All three benchmarks must be passed in the statistical approach, or if one or more of the benchmarks are failed, the attainment demonstration must be supported by a weight of evidence analysis.

i. Limits on the Number of Modeled Exceedance Days

This benchmark is passed when the number of modeled exceedance days in each subregion is less than or equal to 3 or  $N-1$  ( $N$  is the number of severe days), whichever is less. To determine the number of severe days, the States concluded that a day is severe if there are at least two nonattainment areas within the modeling domain with observed 1-hour peak ozone concentrations greater than the corresponding ozone design value (generally the fourth highest daily peak 1-hour ozone concentration at a monitor during a three year period) during the 1990 through 1992 period. The States conclude that only two modeled days, June 26 and August 26, 1991, are severe ozone days. Therefore,  $N$  is 2.

Based on a review of the modeled daily peak ozone concentrations, the States conclude that Strategy 2 with a maximum background ozone concentration of 60 ppb and Strategy 4 with a maximum background ozone concentration of 70 ppb would clearly pass this benchmark test. They also conclude that Strategy 2 with a future maximum background ozone concentration of 70 ppb and Strategy 4 with a maximum background ozone concentration of 80 ppb would also pass the benchmark based on an additional WOE analysis. The WOE analysis is based on the following evidence:

A. Factors Providing Confidence in Modeled Results

Evaluation of the modeling system's performance shows that:

- ◆ Statistical measures for ozone comply with EPA's model performance criteria;
- ◆ Spatial and temporal patterns of monitored surface ozone concentrations are reproduced well by the modeling system on most days;
- ◆ Model performance for ozone across the full domain is consistent with the model performance in individual subregions;
- ◆ Aloft ozone predictions compare favorably with aircraft ozone data; and
- ◆ Model performance for ozone precursors, especially  $\text{NO}_x$ , is very good.

Confidence in underlying data bases is high. A comprehensive field program was conducted during the summer of 1991. This field program was used to collect a large quantity of air quality and meteorological data to support the photochemical grid modeling.

The modeling results obtained by the LADCO States were corroborated with the results from other modeling studies. As part of the Cooperative Regional Model Evaluation (CREME), the photochemical models UAM-IV, UAM-V, and SAQM were applied in the Lake Michigan region. The supplemental analyses show that UAM-V produces results directionally consistent with those produced by UAM-IV and SAQM. All three models concurred in showing that VOC emission reductions are generally locally beneficial and that local  $\text{NO}_x$  emission controls are not beneficial in certain locations, generally within 100 to 200 kilometers downwind of Chicago.

B. Severity of Modeled Episodes

Three of the four ozone episodes modeled reflect meteorological conditions which typically favor high ozone in the Lake Michigan area (when the Lake Michigan area is on the "back-side" of a high pressure system with warm temperatures, high humidity, and south-southwesterly winds). The fourth episode is representative of warm temperatures with easterly winds, conditions which generally produce lower peak ozone concentrations and fewer ozone standard exceedances on a per year basis.

The magnitudes of the observed peak ozone concentrations at one or more locations within the modeling domain for the selected ozone episodes exceed the corresponding ozone design values for many locations within the region. This implies that the modeled ozone

episodes are conservative and that attaining the ozone standard for these episodes should lead to attainment of the ozone standard in non-modeled episodes and during most future ozone conducive periods.

C. Trends Analyses

Several trends analyses have been considered. First, 10-year trends established by the EPA based on second high daily maximum 1-hour ozone concentrations for each year show no significant changes in Chicago, Grand Rapids, Gary, and Kenosha; and a downward trend in Racine and Milwaukee. Second, 17-year trends based on the number of ozone exceedance days normalized based on the annual number of hot days show that the number of exceedance days is significantly decreasing relative to the number of hot days each year. Third, 15-year trends show downward trends in ozone at monitoring sites.

Examination of limited morning total non-methane hydrocarbon concentration levels in Chicago and Milwaukee over the past 10 years show a significant downward trend. This downward trend is consistent with the calculated downward trend in VOC emissions.

The LADCO States conclude that the weight of evidence demonstration provides additional information which verifies the directionality of the modeling and demonstrates the potential stringency of the modeling results. The States conclude this information is sufficient to support minor exceptions to the benchmark, supporting a demonstration of attainment at the higher background ozone concentrations.

ii. Limits on the Values of Allowed Exceedances

Under this benchmark, the maximum modeled ozone concentration on severe days shall not exceed 130 ppb. The States, based on the modeled peak ozone concentrations, conclude this benchmark is passed for Strategy 2 with a maximum background ozone concentration of 70 ppb and for Strategy 4 with a maximum background ozone concentration of 80 ppb.

iii. Required Minimum Level of Air Quality Improvement

Under this benchmark, the number of grid cells with modeled peak ozone concentrations greater than 124 ppb must be reduced by at least 80 percent on each day with allowed modeled ozone standard exceedances. The States, based on the modeled peak ozone concentrations, conclude that this

benchmark is passed for Strategy 2 with a maximum background ozone concentration of 80 ppb and for Strategy 4 with a maximum background ozone concentration of 80 ppb.

From the above, it can be seen that benchmark i. is the most stringent of benchmarks in this case. Based on the statistical approach, coupled with a WOE analysis, the States conclude that Strategy 2 with a maximum background ozone concentration of 70 ppb or Strategy 4 with a maximum background ozone concentration of 80 ppb is sufficient to attain the 1-hour ozone standard by 2007.

The States further conclude, based on both attainment demonstration approaches, that either Strategy 2 or Strategy 4 coupled with future year boundary conditions generally consistent with the impacts of the NO<sub>x</sub> SIP call is sufficient to attain the 1-hour ozone standard. The States, however, note that reliance on the impacts of the NO<sub>x</sub> SIP call cannot be construed as concurrence on the part of the States with the substance of the NO<sub>x</sub> SIP call itself. Indiana has not committed to comply with the requirements of the NO<sub>x</sub> SIP call.

5. Emission Control Strategies  
What Emission Control Strategies Were Considered in the Attainment Demonstrations?

LADCO selected two emission control strategies considered during the Lake Michigan Ozone Control Program for further attainment demonstration modeling (numerous emission control measures were initially examined). The two strategies selected are referred to as Strategy 2 and Strategy 4. These emission control strategies would apply to the ozone nonattainment areas only and are summarized as the following:

a. *Strategy 2.* Strategy 2 includes all national emission control measures (federal controls) mandated by the 1990 Clean Air Act, as amended in 1990, to be in place by 2007 and the State emission controls mandated to be in place by 1996, including the emission controls needed to comply with the requirements for 15 percent ROP plans. Additional ROP plans and State emission controls for the post-1996 period were not considered, and additional NO<sub>x</sub> emission controls, such as NO<sub>x</sub> Reasonably Available Control Technology (RACT), were not considered due to the existence of an approved NO<sub>x</sub> emission control waiver under section 182(f) of the Clean Air Act. Existing NO<sub>x</sub> emission reduction

requirements, such as the acid rain control requirements under Title IV of the Clean Air Act, were considered.

b. *Strategy 4.* Strategy 4 includes all Strategy 2 measures and also includes some additional point, area, and mobile source control measures in the severe ozone nonattainment areas. The additional controls are measures that the State could consider. The State, however, has not evaluated the technical feasibility or cost-effectiveness of these measures. The measures have only been considered regarding their potential to reduce VOC and NO<sub>x</sub> emissions by 2007. For the additional measures considered, please see Table 4.

Table 3 lists the VOC and NO<sub>x</sub> emission reductions expected in Grid B and in the severe ozone nonattainment areas. Emissions control strategy components for Indiana considered in the attainment strategy modeling are listed in Table 4. The following acronyms are used:

- RACT—Reasonably Available Control Technology
- NESHAP—National Emission Standard for Hazardous Air Pollutants
- MACT—Maximum Available Control Technology
- I/M—Vehicle Inspection and Maintenance.

TABLE 3.—EMISSION CONTROL LEVELS FROM STRATEGIES 2 AND 4 GRID B AND SEVERE OZONE NONATTAINMENT AREAS [Lake Michigan Ozone Modeling Domain]

Strategy	VOC		VOC	
	Grid B percent emission change	NO <sub>x</sub>	NO <sub>x</sub>	Severe non-attainment area percentage emissions change
2 .....	-27	-13	-37	-11
4 .....	-40	-19	-53	-18

TABLE 4.—EMISSION CONTROL MEASURES FOR INDIANA

STRATEGY 2—2007 MANDATORY CLEAN AIR ACT MEASURES
POINT SOURCE VOC CONTROLS
Batch Processes RACT
Industrial Wastewater RACT
Marine Vessel Volatile Organic Liquid Loading Controls
Metal Coil Coating Controls Tightening
Paper Coating Controls Tightening
Synthetic Organic Chemical Manufacturing Industry Reactor Processes
Wood Parts Coating
Coke Oven NESHAP
Large Gasoline Storage
Metal Can Coating Controls Tightening
Offset Lithography
Plastic Parts Coating Controls Tightening
Volatile Organic Liquid Storage RACT
Plant Shutdowns (Inland Steel Coke Batteries, Gary Incinerator, and Some Processes at Keil Chemical)
POINT SOURCE NO <sub>x</sub> CONTROLS
Phase I Acid Rain NO <sub>x</sub> Limits
AREA SOURCE VOC CONTROLS

TABLE 4.—EMISSION CONTROL MEASURES FOR INDIANA—Continued

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Automobile Refinishing
Architectural and Industrial Maintenance Coatings
Marine Vessel Volatile Organic Loading
Municipal Waste Landfills
Open Burning Ban
Gasoline Tank Truck Leak Reductions (due to use of reformulated gasoline)
Stage I Refueling Reductions (due to use of reformulated gasoline)
Stage II Refueling Vapor Recovery
Underground Storage Tank Breathing Losses and Leaks (due to use of reformulated gasoline and improved valves)
Commercial/Consumer Solvent Reformulation or Elimination
Off-Road Engine Standards
On-Board Vehicle Controls
MOBILE SOURCE CONTROLS
Tier I Light-Duty Vehicle Standards
Reformulated Gasoline—Phase II (Class C)
Enhanced I/M (no NO <sub>x</sub> cut-points)
Clean Fuel Fleets
Current Transportation Improvement Program/Build Scenario
Northwest Indiana Regional Transportation Plan, including the following elements:
* Programs For Improved Public Transit
* Employer-Based Transportation Management Plans
* Traffic Flow Improvement Programs
* Fringe and Transportation Corridor Parking Facilities Serving Multiple Occupancy Vehicle Programs
* Programs for Secure Bicycle Storage Facilities and Other Bicycle Programs, including Bicycle Lanes

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**STRATEGY 4—2007 MANDATORY MEASURES PLUS**


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All Strategy 2 measures plus:
POINT SOURCE VOC CONTROLS
Improved Rule Effectiveness
Phased Emission Reduction Program
AREA SOURCE VOC CONTROLS
Agricultural Pesticides Application Controls
Degreasing Controls
Graphic Arts
Improved Rule Effectiveness
Petroleum Dry Cleaning Regulations
Small Engine Buy-Back Program
POINT SOURCE NO <sub>x</sub> CONTROLS
Phase II Acid Rain NO <sub>x</sub> Limits
MOBILE SOURCE CONTROLS
California Low Emission Vehicle Controls
Specific Vehicle I/M (no NO <sub>x</sub> cut-points)
Reformulated Gasoline—Phase II (Class B)

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Has the State Adopted a Selected Emission Control Strategy?

The State has not selected either emissions control strategy as the official, adopted emissions control strategy of the Phase II ozone attainment demonstration. The State, however, has adopted and developed regulations for many of the emission control measures contained in the two emission control strategies, and particularly for the controls contained in Strategy 2. Some of the emission control measures in Strategy 4, however, have not been adopted. For example, Indiana has not adopted major agricultural pesticide application restrictions and California low emission vehicle standards.

#### 6. Transportation Conformity

Did the State Address Transportation Conformity in the Submittals?

Indiana has not specifically addressed transportation conformity or associated mobile source emission budgets in the attainment demonstration and no such mobile source emission budget has been adopted as part of the Phase II submittal.

#### 7. State Commitments

Are There any State Commitments for Further Analyses and Air Quality Plans Addressing a Final Ozone Attainment Demonstration for the 1-hour Ozone Standard?

Indiana believes that, with the level of NO<sub>x</sub> emission reductions consistent with the NO<sub>x</sub> SIP call (Indiana itself is not committing at this time to develop a NO<sub>x</sub> SIP and implement NO<sub>x</sub> emission controls consistent with the

NO<sub>x</sub> SIP call) and considering the VOC emission reductions from the 15 percent (1996) and 9 percent (post-1996) ROP plans, little or no additional VOC emission reductions are necessary to provide for attainment of the 1-hour ozone standard. Indiana has committed to submitting a final plan, including additional modeling and adopted emission control regulations, to achieve attainment of the 1-hour standard and to meet post-1999 ROP requirements, no later than the end of 2000. After the impact of the selected regional NO<sub>x</sub> controls is assessed, Indiana will reconsider the need for further VOC emission controls. If additional VOC control measures are needed, Indiana will revise the SIP to include the necessary regulations. Indiana commits to implement the emission control programs on a schedule necessary to meet ROP requirements.

*B. Environmental Protection Agency Review of the Submittals*

1. Adequacy of the State's Demonstration of Attainment

Did the State Adequately Document the Techniques and Data Used to Derive the Modeling Input Data and Modeling Results of the Analyses?

The Phase I submittals from the States thoroughly documented the techniques and data used to derive the modeling input data. The April 1998 submittal adequately summarized the modeling outputs and the conclusions drawn from these model outputs.

Did the Modeling Procedures and Input Data Used Comply With the Clean Air Act and EPA Requirements?

Yes.

Did the States Adequately Demonstrate Attainment of the Ozone Standard?

Indiana, in accordance with EPA's December 1997 guidance, has demonstrated that attainment of the standard is achievable provided sufficient reductions in background ozone concentrations (and background ozone precursor concentrations) occur as a result of the implementation of regional NO<sub>x</sub> emission controls under the NO<sub>x</sub> State implementation plan call. Indiana, however, has not selected a specific emission control strategy that would achieve attainment of the 1-hour ozone standard. This will not be done until the LADCO States submit a final attainment demonstration in December 2000. By then the States plan to complete an assessment of the ozone impacts of regional NO<sub>x</sub> controls and to adopt additional VOC and NO<sub>x</sub> emission control measures needed to attain the 1-hour standard.

Does the Weight of Evidence Test Support the States' Conclusions Regarding the Attainment Demonstration?

The documented WOE analyses support the conclusions of the deterministic test and the statistical test. Both the deterministic test and the statistical test lead to similar conclusions regarding the ozone 1-hour standard attainment demonstration. Both the deterministic and the statistical tests, as supplemented by a WOE analysis, show that attainment can be achieved with local emission controls already implemented couple with significant reductions in transported ozone and ozone precursors.

2. Adequacy of the Emissions Control Strategy

Has an Adopted Emissions Control Strategy Been Adequately Documented?

No. The State has not adopted a final emissions control strategy for attainment of the 1-hour ozone standard. The State, however, has demonstrated that significant reductions in transported ozone and NO<sub>x</sub> will be necessary to attain the 1-hour standard. These reductions are expected to occur as a result of the implementation of regional NO<sub>x</sub> emission reductions. All three of the LADCO States, including Indiana, are expected to implement alternative regional NO<sub>x</sub> controls within their States.

Is the Emission Control Strategy Acceptable?

No. The State must select an emissions control strategy that is consistent with attainment in order to establish a motor vehicle emissions budget. The State must do so in sufficient time for EPA to find the motor vehicle emissions budget adequate by May 31, 2000. The State has committed to adopt and submit a final emissions control strategy associated with a revised modeling analysis by December 2000.

3. State Commitments

Are the State Commitments for Future Analyses and Finalization of the Attainment Demonstration Acceptable?

Yes. Indiana's commitments to complete the attainment demonstration and to adopt and submit the post-1999 ROP plan (the post-1996 ROP plan, covering the period of 1997 through 1999, is currently under review by the EPA) by December 2000 are adequate.

4. Relationship to Other Requirements

Will the Future Analyses Adequately Address the Impacts of the EPA NO<sub>x</sub> State Implementation Plan Call?

Yes. The LADCO States have made it very clear that the 1-hour ozone standard will be difficult to attain without the regional NO<sub>x</sub> emission reductions and that the final demonstration of attainment will incorporate the States' best estimates of the impacts of the NO<sub>x</sub> SIP call or of alternative regional NO<sub>x</sub> emission controls.

Has the State Specified and Adopted an Acceptable Transportation Conformity Mobile Source Emission Budget?

No. The State has not selected a specific emission control strategy. The State must select a control strategy that

is consistent with attainment of the NAAQS. The will need to establish a motor vehicle emissions budget based on the selected strategy and will need to submit the budget in time for EPA to find the budget adequate by May 31, 2000.

*C. Summary*

Overall, Is Indiana's Ozone Attainment Demonstration Acceptable?

Indiana's commitment to complete the control strategy adoption process is adequate to warrant a conditional approval of the attainment demonstration plan. Indiana has accomplished as much as can be expected at this time and has generally met the requirements of the EPA December 1997 ozone attainment demonstration guidance, with the exception of adopting a final emission control strategy and associated emission control regulations.

What Portions of the Attainment Demonstration Need Additional Work and Consideration in the Final Attainment Demonstration?

The following items need further consideration in the final ozone attainment demonstration:

1. A final modeled demonstration of attainment that considers the impacts of the regional NO<sub>x</sub> emission reductions, local control measures, and NO<sub>x</sub> emissions control waiver (if maintained);

2. Adoption and submission of CAA measures, including VOC and NO<sub>x</sub> (within the modeling domain) measures relied on in the final modeled attainment demonstration;

3. Motor vehicle emissions budget, including both VOC and NO<sub>x</sub> emissions.

The EPA has found that the motor vehicle emissions budget in the attainment demonstration submitted for the Chicago-Gary-Lake County ozone nonattainment area is inadequate for conformity purposes. The EPA is proposing to conditionally approve the attainment demonstration SIP if the State corrects the deficiencies that cause the motor vehicle emissions budget to be inadequate and, alternatively, to disapprove it if Indiana does not correct the deficiencies.

**III. Proposed Action**

The Environmental Protection Agency proposes to issue a conditional approval of the ozone attainment demonstration. The State already committed to do the following in the April 1998 ozone attainment demonstration: (1) perform and submit a final modeled ozone

attainment demonstration by December 2000; (2) adopt and submit a specific emissions control strategy, including adopted control measures, adequate to attain the 1-hour ozone NAAQS in the ozone nonattainment area and throughout the ozone modeling domain by December 2000; (3) adopt and submit control measures necessary to meet ROP from 1999 until the attainment year and the associated target calculations. For EPA to issue a final conditional approval the State will need to take the following steps in sufficient time for EPA to determine by May 31, 2000 that the state has an adequate motor vehicle emissions budget and an adequate commitment for a mid-course review: (1) Select a control strategy consistent with its current modeling analysis; (2) adopt and submit an adequate motor vehicle emissions budget consistent with the selected strategy; and (3) commit to perform a mid-course review in 2003.

Because many States may shortly be submitting revised demonstrations with revised motor vehicle emission budgets, EPA is providing a 60 day comment period on this proposed rule. If Indiana submits a revised attainment demonstration during the 60 day comment period, EPA will place the revisions in the docket for this rulemaking and will post a notice on EPA's website at [www.epa.gov/oms/traq](http://www.epa.gov/oms/traq). By posting notice on the website, EPA will also initiate the adequacy process.

If the State does not take one or more of the actions listed above in time for EPA to make the May 31, 2000 determinations, EPA will disapprove Indiana's attainment demonstration submission for the Chicago-Gary-Lake County nonattainment area.

If EPA issues a final conditional approval of the State's submission, the conditional approval will convert to a disapproval if the State does not adopt and submit a complete SIP submission with the following elements by December 31, 2000: (1) A final revised modeling analysis that fully assesses the impacts of regional NO<sub>x</sub> reductions, models a specific local emissions reduction strategy, and reconsiders the effectiveness of the NO<sub>x</sub> waiver; (2) control measures necessary to meet the ROP requirement from 1999 until the attainment year, including target calculations; and (3) VOC and regional (within the modeling domain) NO<sub>x</sub> emission control measures sufficient to support the final ozone attainment demonstration.

If the State makes a complete submission with all of the above elements by December 31, 2000, EPA

will propose action on the new submissions for the purpose of determining whether to issue a final full approval of the attainment demonstration.

#### *What Are the Consequences of State Failure?*

This section explains the CAA consequences of State failure to meet the time frames and terms described generally in this notice. The CAA provides for the imposition of sanctions and the promulgation of a federal implementation plan if States fail to submit a required plan, submit a plan that is determined to be incomplete or if EPA disapproves a plan submitted by the State (We are using the phrase "failure to submit" to cover both the situation where a State makes no submission and the situation where the State makes a submission that we find is incomplete in accordance with section 110(k)(1)(B) and 40 CFR part 51, appendix V.) For purposes of sanctions, there are no sanctions clocks in place based on a failure to submit. Thus, the description of the timing of sanctions, below, is linked to a potential disapproval of the State's submission.

#### *What Are the CAA's Provisions for Sanctions?*

If EPA disapproves a required SIP, such as the attainment demonstration SIPs, section 179(a) provides for the imposition of two sanctions. The first sanction would apply 18 months after EPA disapproves the SIP if the State fails to make the required submittal which EPA proposes to fully or conditionally approve within that time. Under EPA's sanctions regulations, 40 CFR 52.31, the first sanction would be 2:1 offsets for sources subject to the new source review requirements under section 173 of the CAA. If the State has still failed to submit a SIP for which EPA proposes full or conditional approval 6 months after the first sanction is imposed, the second sanction will apply. The second sanction is a limitation on the receipt of Federal highway funds. EPA also has authority under section 110(m) to a broader area, but is not proposing to take such action today.

#### *What Are the CAA's FIP Provisions if a State Fails to Submit a Plan?*

In addition to sanctions, if EPA finds that a State failed to submit the required SIP revision or disapproves the required SIP revision EPA must promulgate a FIP no later than 2 years from the date of the finding if the deficiency has not been corrected. The attainment demonstration SIPs on which EPA is

taking action today were originally due in November 1994. However, through a series of policy memoranda, EPA recognized that States had not submitted attainment demonstrations and were constrained to do so until ozone transport had been further analyzed. As provided in the Background, above, EPA provided for States to submit the attainment demonstration SIPs in two phases. In June 1996, EPA made findings that ten States and the District of Columbia had failed to submit the phase I SIPs for nine nonattainment areas. 61 FR 36292 (July 10, 1996). In addition on May 19, 1997, EPA made a similar finding for Pennsylvania for the Philadelphia area. 62 FR 27201.

In July 1998, several environmental groups filed a notice of citizen suit, alleging that EPA had outstanding sanctions and FIP obligations for the serious and severe nonattainment areas on which EPA is proposing action today. These groups filed a lawsuit in the Federal District Court for the District of Columbia on November 8, 1999.

## **IV. Administrative Requirements**

### *A. Executive Orders 12866*

The Office of Management and Budget (OMB) has exempted this regulatory action from review under Executive Orders 12866, entitled "Regulatory Planning and Review."

### *B. Executive Order 13045*

Executive Order 13045, entitled "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997), applies to any rule that the EPA determines (1) is "economically significant," as defined under Executive Order 12866, and (2) the environmental health or safety risk addressed by the rule has a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to Executive Orders 13045 because it does not involve decisions intended to mitigate environmental health and safety risks.

### *C. Executive Order 13084*

Under Executive Orders 13084, EPA may not issue a regulation that is not required by statute, that significantly affects or uniquely affects the communities of Indian tribal



governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments. If the mandate is unfunded, EPA must provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected and other representatives of Indian tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities." Today's rule does not significantly or uniquely affect the communities of Indian tribal governments. This action does not involve or impose any requirements that affect Indian Tribes. Accordingly, the requirements of section 3(b) of Executive Orders 13084 do not apply to this rule.

#### D. Executive Order 13132

Executive Order 13132, Federalism (64 FR 43255, August 10, 1999), revokes and replaces Executive Orders 12612 (Federalism) and 12875 (Enhancing the Intergovernmental Partnership). Executive Order 13132 requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State

law unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

This rule will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132 (64 FR 43255, August 10, 1999), because it merely approves a State rule implementing a federal standard, and does not alter the relationship or the distribution of power and responsibilities established in the Clean Air Act. Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

#### E. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to conduct a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and small governmental jurisdictions. This proposed rule will not have a significant impact on a substantial number of small entities because SIP approvals under section 110 and subchapter I, part D of the Clean Air Act do not create any new requirements but simply approve requirements that the State is already imposing. Therefore, because the Federal SIP approval does not create any new requirements, I certify that this action will not have a significant economic impact on a substantial number of small entities. Moreover, due to the nature of the Federal-State relationship under the Clean Air Act, preparation of a flexibility analysis would constitute Federal inquiry into the economic reasonableness of state action. The Clean Air Act forbids EPA to base its actions concerning SIPs on such grounds. *Union Electric Co. v. U.S. EPA*, 427 U.S. 246, 255-66 (1976); 42 U.S.C. 7410(a)(2).

If the conditional approval is converted to a disapproval under section 110(k), based on the State's failure to meet the commitment, it will not affect any existing State requirements applicable to small entities. Federal disapproval of the State submittal does not affect State-enforceability. Moreover, EPA's disapproval of the submittal does not impose any new requirements. Therefore, I certify that such a disapproval action will not have a

significant economic impact on a substantial number of small entities because it would not remove existing requirements nor would it substitute a new Federal requirement.

The EPA's alternative proposed disapproval of the State request under section 110 and subchapter I, part D of the Act would not affect any existing requirements applicable to small entities. Any pre-existing Federal requirements would remain in place after this disapproval. Federal disapproval of the State submittal does not affect State-enforceability. Moreover EPA's disapproval of the submittal would not impose any new Federal requirements. Therefore, I certify that the proposed disapproval would not have a significant impact on a substantial number of small entities.

#### F. Unfunded Mandates

Under section 202 of the Unfunded Mandates Reform Act of 1995 ("Unfunded Mandates Act"), signed into law on March 22, 1995, EPA must prepare a budgetary impact statement to accompany any proposed or final rule that includes a Federal mandate that may result in estimated annual costs to State, local, or tribal governments in the aggregate; or to private sector, of \$100 million or more. Under section 205, EPA must select the most cost-effective and least burdensome alternative that achieves the objectives of the rule and is consistent with statutory requirements. Section 203 requires EPA to establish a plan for informing and advising any small governments that may be significantly or uniquely impacted by the rule.

EPA has determined that the proposed conditional approval action does not include a Federal mandate that may result in estimated annual costs of \$100 million or more to either State, local, or tribal governments in the aggregate, or to the private sector. This Federal action approves pre-existing requirements under State or local law, and imposes no new requirements. Accordingly, no additional costs to State, local, or tribal governments, or to the private sector, result from this action.

Sections 202 and 205 do not apply to the proposed disapproval because the proposed disapproval of the SIP submittal would not, in and of itself, constitute a Federal mandate because it would not impose an enforceable duty on any entity. In addition, the Act does not permit EPA to consider the types of analyses described in section 202 in determining whether a SIP submittal meets the CAA. Finally, section 203 does not apply to the proposed

disapproval because it would affect only the State of Indiana, which is not a small government.

### G. National Technology Transfer and Advancement Act

Section 12 of the National Technology Transfer and Advancement Act (NTTAA) of 1995 requires Federal agencies to evaluate existing technical standards when developing new regulations. To comply with NTTAA, the EPA must consider and use "voluntary consensus standards" (VCS) if available and applicable when developing programs and policies unless doing so would be inconsistent with applicable law or otherwise impractical.

EPA believes that VCS are inapplicable to this action. Today's action does not require the public to perform activities conducive to the use of VCS.

### List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Hydrocarbons, Nitrogen dioxide, Ozone.

**Authority:** 42 U.S.C. 7401 *et seq.*

Dated: November 30, 1999.

**Francis X. Lyons,**

*Regional Administrator, Region 5.*

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## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 52

[WI80-01-7311; FRL-6503-3]

### Approval and Promulgation of Implementation Plans; Wisconsin; Ozone

**AGENCY:** Environmental Protection Agency.

**ACTION:** Proposed rule.

**SUMMARY:** The Environmental Protection Agency (EPA) is proposing to conditionally approve the 1-hour ozone attainment demonstration State Implementation Plan (SIP) for the Milwaukee-Racine, Wisconsin severe ozone nonattainment area submitted by the Wisconsin Department of Natural Resources (WDNR) on April 30, 1998. This proposed conditional approval is based on the submitted modeling analysis and the State's commitments to adopt and submit a final ozone attainment demonstration and a post-1999 Rate of Progress (ROP) plan, including the necessary State air pollution control regulations to support the attainment and ROP plans, by

December 31, 2000. We are also proposing, in the alternative, to disapprove this demonstration if the State does not, by December 31, 1999, select a control strategy associated with its submitted modeled analysis and an adequate motor vehicle emissions budget for Volatile Organic Compound (VOC) and Oxides of Nitrogen (NO<sub>x</sub>) for the ozone nonattainment area that complies with EPA's conformity regulations and that is derived from the selected emissions control strategy. In addition, the State must submit a commitment to adopt VOC rules and regulations for the plastic parts coating, industrial cleanup solvents, and ink manufacturing by December 2000; and submit an enforceable commitment to conduct a mid-course review of the ozone attainment demonstration in 2003.

**DATES:** Comments must be received on or before February 14, 2000.

**ADDRESSES:** Written comments should be sent to: Carlton Nash, Chief, Regulation Development Section, Air Programs Branch (AR-18J), U.S. Environmental Protection Agency, 77 West Jackson Boulevard, Chicago, Illinois 60604.

Copies of the State submittal and EPA's technical support document are available for public inspection during normal business hours at the following address: United States Environmental Protection Agency, Region 5, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. (Please telephone Michael G. Leslie at (312) 353-6680 before visiting the Region 5 Office.)

**FOR FURTHER INFORMATION CONTACT:** Michael G. Leslie, Regulation Development Section, Air Programs Branch (AR-18J), U.S. Environmental Protection Agency, Region 5, 77 West Jackson Boulevard, Chicago, Illinois 60604, Telephone Number (312) 353-6680.

**SUPPLEMENTARY INFORMATION:** This section provides background information on attainment demonstration SIPs for the 1-hour ozone national ambient air quality standard (NAAQS) and an analysis of the 1-hour ozone attainment demonstration SIP submittal for the Milwaukee-Racine area.

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## I. Background Information

### A. What Is the Basis for the State's Attainment Demonstration SIP?

#### 1. CAA Requirements

The Clean Air Act (CAA) requires EPA to establish National Ambient Air Quality Standards (NAAQS) for certain widespread pollutants that cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. CAA sections 108 and 109. In 1979, EPA promulgated the 1-hour 0.12 parts per million (ppm) ground-level ozone standard. 44 FR 8202 (Feb. 8, 1979). Ground-level ozone is not emitted directly by sources. Rather, emissions of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) react in the presence of sunlight to form ground-level ozone. NO<sub>x</sub> and VOC are referred to as precursors of ozone.

An area exceeds the 1-hour ozone standard each time an ambient air quality monitor records a 1-hour average ozone concentration above 0.124 ppm. An area is violating the standard if, over a consecutive 3-year period, more than three exceedances are expected to occur at any one monitor. The CAA, as amended in 1990, required EPA to designate as nonattainment any area that was violating the 1-hour ozone standard, generally based on air quality monitoring data from the 3-year period from 1987-1989. CAA section 107(d)(4); 56 FR 56694 (Nov. 6, 1991). The CAA further classified these areas, based on the area's design value, as marginal, moderate, serious, severe or extreme. CAA section 181(a). Marginal areas were suffering the least significant air pollution problems while the areas classified as severe and extreme had the most significant air pollution problems.

The control requirements and dates by which attainment needs to be achieved vary with the area's classification. Marginal areas are subject to the fewest mandated control requirements and have the earliest attainment date. Severe and extreme areas are subject to more stringent planning requirements but are provided more time to attain the standard. Serious areas are required to attain the 1-hour standard by November 15, 1999 and severe areas are required to attain by November 15, 2005 or November 15, 2007. The Milwaukee-Racine area is classified as severe and its attainment date is November 15, 2007.

Under section 182(c)(2) and (d) of the CAA, serious and severe areas were required to submit by November 15, 1994, demonstrations of how they would attain the 1-hour standard and