

DRAFT

Maintenance Plan for the
Illinois Portion of the
Chicago Ozone Nonattainment Area
for the 1997 8-Hour Ozone Standard
(Revised)

AQPSTR 11-04

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Illinois Environmental Protection Agency
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EXECUTIVE SUMMARY

This document describes Illinois' Maintenance Plan for the Illinois portion of the Chicago ozone nonattainment area. A Maintenance Plan is required before the area can be redesignated from nonattainment to attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) promulgated in 1997. This document also provides technical information required to support a redesignation request. Illinois intends to submit such a request to the U. S. Environmental Protection Agency (U.S. EPA). This revision incorporates motor vehicle emissions estimates developed using the U.S. EPA's MOVES model. The Illinois Environmental Protection Agency (Illinois EPA) has prepared this plan in consultation with the Indiana Department of Environmental Management (IDEM), the Wisconsin Department of Natural Resources (WDNR), and the Michigan Department of Environmental Quality (MDEQ), the Lake Michigan Air Directors Consortium (LADCO), and the U.S. EPA. The IDEM has submitted a similar plan for the Indiana portion of the Chicago nonattainment area.

Ozone air quality has dramatically improved in the Lake Michigan region as a result of implementation of State and Federal control measures since the designation of the Chicago area as nonattainment in 2004. With the exception of Holland, Michigan, the entire Lake Michigan region, including the Chicago nonattainment area, has at least three years of complete, quality assured ambient air quality monitoring data for 2006-2008 that demonstrates compliance with the 1997 8-hour ozone NAAQS. These air quality improvements are due to permanent and enforceable emission control measures.

This Maintenance Plan provides for continued attainment of the 1997 8-hour ozone air quality standard for the Chicago nonattainment area for a period of ten years after U.S. EPA has formally redesignated the area to attainment. The Plan also provides assurances that, even if there is a subsequent violation of the air quality standard, measures listed in the Plan will prevent any future occurrences through contingency measures that would be triggered upon such an occurrence. Finally, the Plan includes on-road motor vehicle emissions budgets for use in transportation conformity determinations to assure that any increases in emissions from this sector do not jeopardize continued attainment of the 8-hour ozone standard during the ten-year maintenance period.

1.0 INTRODUCTION

This document describes Illinois' Maintenance Plan for the Illinois portion of the Chicago ozone nonattainment area. A maintenance plan is required before the area can be redesignated from nonattainment to attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) promulgated by the U. S. Environmental Protection Agency (U.S. EPA) in 1997. Illinois intends to submit such a request to the U.S. EPA in conjunction with this Maintenance Plan. The Illinois EPA has prepared this plan in consultation with the Indiana Department of Environmental Management (IDEM), the Wisconsin Department of Natural Resources (WDNR), and the Michigan Department of Environmental Quality (MDEQ), the Lake Michigan Air Directors Consortium (LADCO), and U.S. EPA. The IDEM has submitted a similar plan for the Indiana portion of the Chicago nonattainment area. With the exception of Holland, Michigan, the entire Lake Michigan region, including the Chicago area, has at least three years of complete, quality assured ambient air quality monitoring data for 2006-2008, demonstrating attainment with the 1997 8-hour ozone NAAQS.

This document also provides the technical information needed to support a request to redesignate the Chicago area to attainment of the 8-hour ozone NAAQS. Section 107 of the Clean Air Act (CAA) establishes specific requirements to be met in order for a nonattainment area to be considered for redesignation. Before an area can be reclassified to attainment, U.S. EPA must make a determination that the area has attained the 8-hour ozone NAAQS based on at least three complete years of ambient monitoring data. U.S. EPA must have approved a State Implementation Plan (SIP) for the area under Section 110 and Part D of the CAA. The state must demonstrate that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements. Finally, the state must submit, and U.S. EPA must approve, a maintenance plan under Section 175(A) of the CAA, including provisions for contingency measures that will be implemented if future violations of the 8-hour ozone NAAQS are measured.

This Maintenance Plan provides for the continued attainment of the 8-hour ozone NAAQS for the Chicago nonattainment area (NAA) for a period of at least ten years after U.S. EPA has formally redesignated the area to attainment. The Plan also provides assurances that even if a subsequent violation of the ozone NAAQS occurs, provisions in the Plan will prevent any future occurrences through contingency measures that would be triggered upon such occurrence.

This document addresses the maintenance plan requirements established by the CAA and U.S. EPA, and includes additional information to support continued compliance with the 8-hour ozone NAAQS.

1.1 Regulatory Background

The CAA, as amended in 1990, requires areas that fail to meet the NAAQS for ozone to develop SIPs to expeditiously attain and maintain the NAAQS. Historically, exceedances of the ozone NAAQS have been monitored in Cook and Lake Counties in Illinois, and in

portions of Wisconsin, Indiana, and Michigan immediately downwind of the Chicago, Gary, and Milwaukee metropolitan areas.

The Chicago NAA, which includes Lake and Porter Counties in northwest Indiana, was originally designated as nonattainment in 2004 pursuant to the 1997 revisions to the ozone NAAQS. Several counties in eastern Wisconsin, and one county in western Michigan adjacent to Lake Michigan were also designated as nonattainment of the 8-hour ozone NAAQS, although these areas are separate from the Chicago NAA. Figure 1.1 depicts the current NAAs in the Lake Michigan region.

Figure 1.1
Map of the Lake Michigan Ozone Nonattainment Areas



The following is a list of the counties, and portions thereof, contained in the Chicago 8-hour ozone severe nonattainment area:

- Cook County, IL
- Lake County, IL
- DuPage County, IL
- McHenry County, IL

- Kane County, IL
- Will County, IL
- Grundy County, IL (Aux Sable and Goose Lake Townships)
- Kendall County, IL (Oswego Township)
- Lake County, IN
- Porter County, IN

As a result of the designation as nonattainment and the accompanying classification as moderate, these areas were subject to new requirements, including development of a plan demonstrating that the area would meet the federal 8-hour NAAQS for ozone by June 15, 2010.

Recognizing the need for a regional solution, the States of Illinois, Indiana, Michigan, Ohio, and Wisconsin worked cooperatively, under the auspices of the Lake Michigan Air Directors Consortium (LADCO), to jointly develop and evaluate an effective regional attainment strategy to enable the Lake Michigan region to attain the 8-hour ozone NAAQS. The attainment strategy recognizes the importance of both locally generated ozone precursor emissions and the need for significant reductions of incoming (transported) ozone and ozone precursor emissions (including oxides of nitrogen, or NO_x) to allow the States to attain the NAAQS. The emission reductions needed to attain the 8-hour ozone NAAQS include both State and Federal measures that have reduced ozone precursor emissions both locally and regionally. These measures have allowed the Chicago nonattainment area to attain the 8-hour ozone standard by the attainment deadline established by the U.S. EPA.

1.2 Status of Air Quality

Ozone monitoring data for the most recent three-year period, 2006 through 2008, demonstrates that air quality has met the 1997 8-hour ozone NAAQS in the entire Lake Michigan region, including the Chicago nonattainment area, with the exception of Holland, Michigan. Modeling performed by LADCO shows that Holland, MI will attain the 1997 ozone NAAQS by 2012.

2.0 REDESIGNATION AND MAINTENANCE PLAN REQUIREMENTS

Sections 107 and 110 of the CAA list a number of requirements that must be met by nonattainment areas prior to consideration for redesignation to attainment. One of those requirements is the maintenance plan, which describes a state's plan for maintaining the NAAQS for a ten-year period after redesignation to attainment. U.S. EPA has published guidance for the preparation of maintenance plans and redesignation requests. This guidance is contained in a document entitled "Procedures for Processing Requests to Redesignate Areas to Attainment" (September 4, 1992).

Before a redesignation to attainment can be promulgated, U.S. EPA must:

- Determine that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained. Ozone monitoring data must show that violations of the ambient NAAQS are no longer occurring. This showing must rely on three consecutive years of data. The ambient air monitoring data must be quality assured in accordance with 40 CFR 58.10, recorded in U.S. EPA's Air Quality System (AQS) data base, and is available to the public.
- Approve the state's plan for demonstrating attainment. The attainment plan, which is based on air quality modeling, must contain enforceable control measures and must be submitted as a revision to the state's SIP after a public hearing.
- Determine that the improvement in air quality between the year violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions.
- Approve the state's maintenance plan. The requirements for the maintenance plan are discussed below.
- Determine that all other requirements applicable to nonattainment areas have been met.

A maintenance plan provides for the continued attainment of the 8-hour ozone NAAQS for a nonattainment area for a period of ten years after U.S. EPA has formally redesignated the area to attainment. The plan also provides assurances that even if a subsequent violation of the NAAQS occurs, provisions in the plan will prevent any future occurrences through contingency measures that would be triggered upon such occurrence. To be approvable, the state is required to have a public comment period and provide the opportunity for a public hearing on the Maintenance Plan prior to adoption. The maintenance plan must contain the following elements:

- A comprehensive emission inventory of the precursors of ozone completed for the "attainment year";

- A projection of the emission inventory forward to a year at least ten years after redesignation and a demonstration that the projected level of emissions is sufficient to maintain the ozone NAAQS;
- A commitment that, once redesignated, the state will continue to operate an appropriate monitoring network to verify maintenance of the attainment status;
- A demonstration of legal authority to implement and enforce all control measures contained in the SIP;
- Provisions for future updates of the inventory to enable tracking of emission levels, including an annual emission statement from major sources;
- Motor vehicle emissions budgets for transportation conformity for the ten-year maintenance period;
- A commitment to submit a revised maintenance plan eight years after redesignation;
- A commitment to enact and implement additional contingency control measures expeditiously in the event that future violations of the NAAQS occur;
- A list of potential contingency measures that would be implemented in such an event.

Illinois' Maintenance Plan has been prepared in accordance with the requirements specified in U.S. EPA's guidance document and additional guidance received from U.S. EPA staff.

The following sections of this document describe how U.S. EPA's requirements have been met.

3.0 OZONE MONITORING

U.S. EPA's published guidance document, "Procedures for Processing Requests to Redesignate Areas to Attainment" (September 4, 1992), details specific requirements regarding the collection and use of ambient air monitoring data needed to support a redesignation request. Before the Chicago NAA can be redesignated, Illinois must demonstrate that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained. Ozone monitoring data must show that violations of the NAAQS are no longer occurring within the nonattainment area. This showing must rely on three complete, consecutive calendar years of quality assured data. Further, the air monitoring data must be quality assured in accordance with 40 CFR 58.10, recorded in U.S. EPA's AQS data base, and made available to the public. Finally, Illinois must commit to continue to operate an appropriate monitoring network to verify the maintenance of the attainment status, once the area has been redesignated.

The following subsections describe how each of these requirements has been addressed.

3.1 Monitored Design Values

Currently there are 55 ozone monitors located in the nonattainment counties in the Lake Michigan region; 9 are located in northwestern Indiana, 17 in northeastern Illinois, 13 in western Michigan, and 16 in eastern Wisconsin.

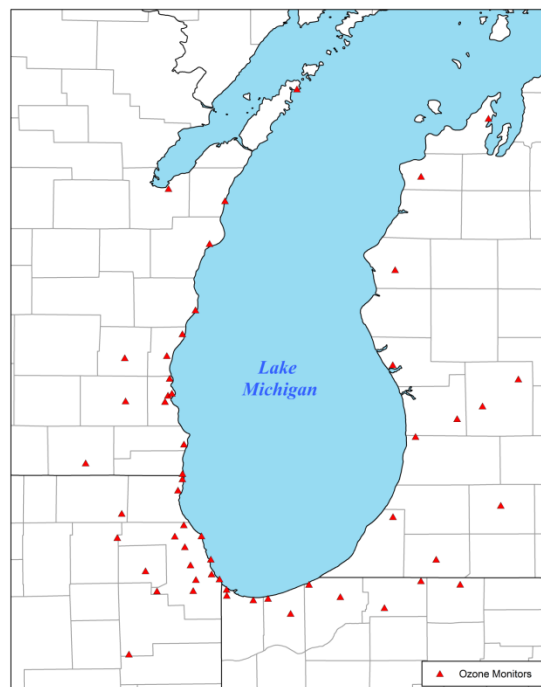
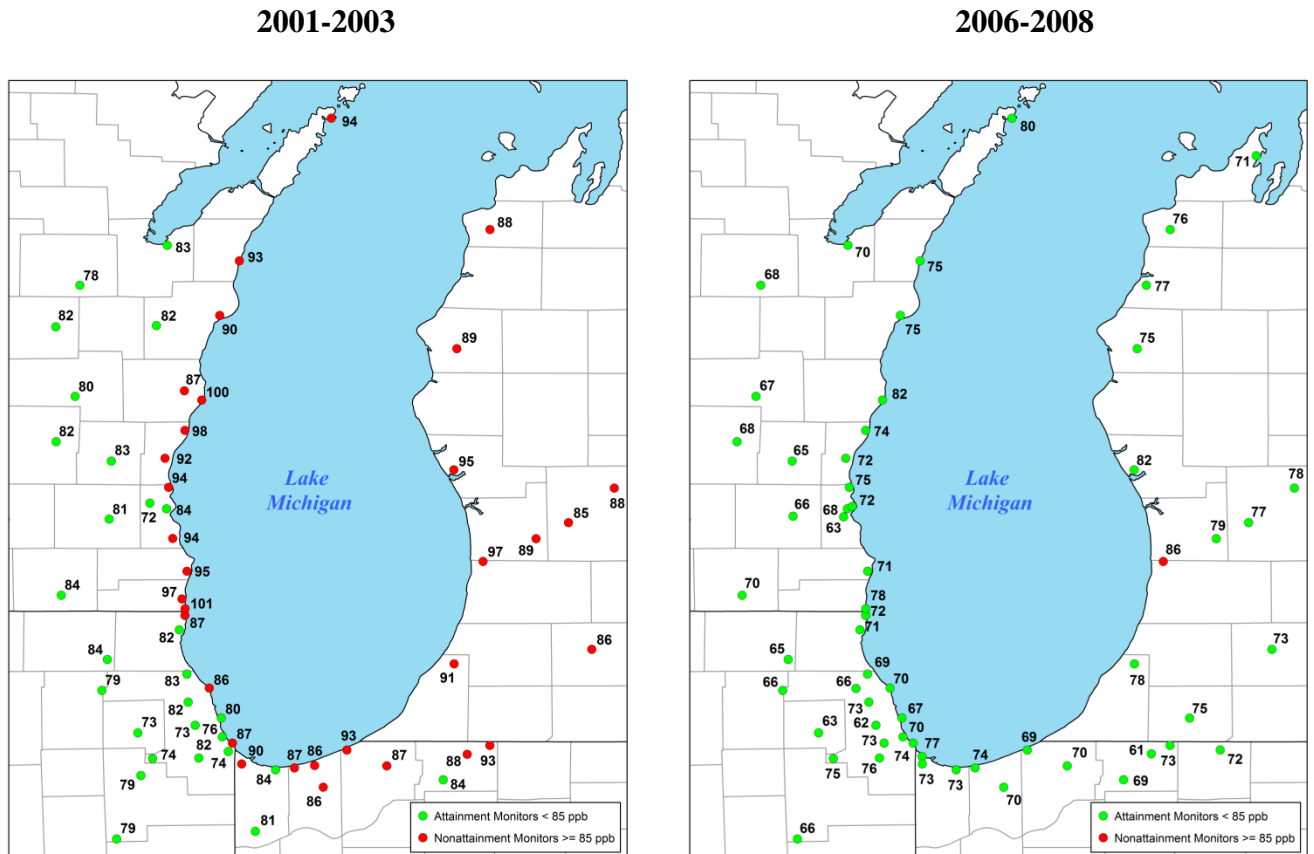


Figure 3.1 Ozone Monitors in the Lake Michigan Area

To determine whether the NAAQS is being exceeded, the design value must be

calculated. The current U.S. EPA method for calculating the ozone design value is to average the 4th highest daily maximum 8-hour value for each year over the 3-year period. The calculated 8-hour ozone design values for the monitors in the Lake Michigan region for 2006-2008 are included as Appendix A of this report. Figure 3.2 compares the design values for the 2001-2003 period for monitoring stations in the Lake Michigan region to the corresponding design values from 2006-2008. The data demonstrate that ozone air quality has improved dramatically throughout the Lake Michigan region and that the NAAQS for ozone has been attained for the 2006-2008 period at all locations except Holland, Michigan.

Figure 3.2
Comparison of 8-Hour Ozone Design Values for the Lake Michigan Region
Between 2001-2003 and 2006-2008



3.2 Quality Assurance

Illinois EPA has quality assured all data shown in Appendix A for all sites located in Illinois in accordance with 40 CFR 58.10 and the Illinois EPA's Quality Assurance Plan,

which describes Illinois EPA's standard operating procedures for operating the ambient monitoring network and validating the data. The other states in the Lake Michigan region have similar quality assurance plans. Illinois EPA has recorded the data in the U.S. EPA's AQS database, as have the other Lake Michigan states. U.S. EPA's AQS database is available to the public.

3.3 Continued Monitoring

Illinois commits to continue monitoring ozone levels according to a U.S. EPA approved monitoring plan, as required to ensure maintenance of the ozone NAAQS. Should changes in the location of an ozone monitor become necessary, Illinois EPA will work with U.S. EPA to ensure the adequacy of the monitoring network. Illinois EPA will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58. Illinois EPA will continue to enter all data into AQS on a timely basis in accordance with federal guidelines.

4.0 EMISSIONS INVENTORY

A redesignation request must contain a demonstration that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. As described previously in Section 3.0, a three-year monitoring period is used to evaluate whether attainment has been achieved. In this Section, the “attainment year” refers to the last year (2008) of the three-year period (2006-2008) used to demonstrate attainment. The request should also include a projection of the emission inventory to a year at least 10 years following redesignation, a demonstration that the projected level of emissions is sufficient to maintain the ozone NAAQS, and a commitment to provide future updates of the inventory to enable tracking of emission levels during the 10-year maintenance period.

4.1 Attainment Year Inventory, 2008

Illinois EPA has prepared a comprehensive emissions inventory for the Illinois portion of the Chicago ozone nonattainment area, including point, area, and on-road and off-road mobile sources for precursors of ozone (VOM and NO_x) for the attainment year, 2008. Point source information was compiled from 2008 annual emission reports submitted to the Illinois EPA by emission sources and the U.S. EPA’s Clean Air Markets Division database for electric utilities. Area source emissions were “grown” from 2002 activity levels appropriate for each source category. Biogenic emissions are not included in these summaries. On-road mobile source emissions were calculated using U.S. EPA’s MOVES emissions model with vehicle miles traveled (VMT) data provided by the Illinois Department of Transportation (IDOT). Off-road mobile source emissions were calculated using U.S. EPA’s NONROAD emissions model.

Table 4.1 summarizes the 2008 emissions estimates for the Chicago ozone nonattainment area. This summary has been revised to incorporate emissions estimates for on-road mobile sources using U.S. EPA’s MOVES model.

Table 4.1
2008 Chicago Ozone Nonattainment Area
VOM and NO_x Emissions

(Emissions stated in tons per ozone season weekday)

| Source Category | VOM | NO _x |
|-------------------------|--------|-----------------|
| Point Sources | 53.27 | 154.50 |
| Area Sources | 351.51 | 38.56 |
| On-Road Mobile Sources | 117.23 | 373.52 |
| Off-Road Mobile Sources | 265.44 | 330.18 |
| Total | 787.45 | 896.76 |

4.2 Air Quality Improvements and Emission Controls

The Chicago area was designated nonattainment in 2004, based on ozone air quality monitoring data collected between 2001 and 2003. Since that time, permanent and enforceable reductions of ozone precursor emissions have contributed to improvements in ozone air quality and to the attainment of the ozone NAAQS. Some of these emission reductions were due to the application of tighter federal emission standards on motor vehicles and fuels, and some due to the requirements of the federal NO_x SIP Call. Section 5.0 of this report describes these reductions in more detail, along with an explanation of their regulatory status. In this subsection, the emission levels from 2008 are compared to emission levels estimated in 2002 when the Chicago area was first proposed for a nonattainment designation for the 1997 8-hour ozone standard.

U.S. EPA's 8-hour ozone Implementation Rule required that states with ozone nonattainment areas prepare and submit a 2002 base year anthropogenic inventory of sources of ozone precursor emissions. The base year inventory included emissions from point, area, on-road mobile and off-road mobile emissions. Illinois EPA prepared and submitted this inventory in June 2006. Table 4.2 summarizes 2002 emissions by major source category and by pollutant for the Illinois portion of the Chicago nonattainment area. This summary has been revised to incorporate emissions estimates for on-road mobile sources using U.S. EPA's MOVES model.

Table 4.2
2002 Chicago Ozone Nonattainment Area
VOM and NO_x Emissions

(Emissions stated in tons per ozone season weekday)

| Source Category | VOM | NO _x |
|-------------------------|--------|-----------------|
| Point Sources | 76.62 | 307.73 |
| Area Sources | 273.33 | 42.93 |
| On-Road Mobile Sources | 168.06 | 540.13 |
| Off-Road Mobile Sources | 233.77 | 326.65 |
| Total | 751.78 | 1,217.44 |

Comparing the 2002 inventory to that for 2008 indicates that total VOM emissions in the Chicago area remained about the same, while NO_x emissions in the Chicago NAA decreased significantly, about 320 tpd, during the same time period. These sizeable emission reductions in ozone precursor emissions, plus reductions in upwind areas in Illinois and other nearby states, resulted in a substantial improvement in ozone air quality in the Chicago area, ultimately resulting in attainment of the 1997 8-hour ozone NAAQS.

4.3 Emission Projections

A maintenance plan must contain a demonstration that the level of emissions projected for the ten-year period following redesignation are sufficient to maintain the ozone NAAQS. Accordingly, Illinois EPA has projected VOM and NO_x emissions for the Illinois portion of the Chicago nonattainment area for 2025. Illinois EPA has also projected emissions to 2015 and 2020, to represent two midpoints during the maintenance period. Emissions for these three projection years are compared to emission levels in 2008 to determine if emissions are sufficient to maintain the NAAQS during this period.

Chicago area point source emissions for 2015, 2020, and 2025 were estimated using the 2002 base year inventory and growth factors appropriate for each source category. Area source emissions were projected by applying category-specific growth factors to estimates contained in the 2002 base year inventory. County population projections for 2015, 2020, and 2025 were used to estimate emissions for categories which rely on a per capita emissions factors. Off-road emissions projections were also developed using the 2002 inventory and growth factors contained in U.S. EPA's NONROAD model. On-road motor vehicle emissions were estimated using U.S. EPA's MOVES motor vehicle emissions model. The figures assume the continued use of reformulated gasoline, the continued phase-in of the Tier 2 motor vehicle emissions standards, and operation of an enhanced vehicle inspection and maintenance program. Total vehicle miles of travel (VMT) for 2015, 2020, and 2025 were assumed to increase at a rate of 1.5 percent per year from 2002.

Tables 4.3, 4.4, and 4.5 include the VOM and NO_x emissions estimates for the years 2015, 2020, and 2025, respectively, for the Illinois portion of the Chicago nonattainment area.

Table 4.3
2015 Chicago Ozone Nonattainment Area
VOM and NO_x Emissions

(Emissions stated in tons per ozone season weekday)

| Source Category | VOM | NO _x |
|-------------------------|--------|-----------------|
| Point Sources | 62.02 | 150.06 |
| Area Sources | 363.86 | 39.85 |
| On-Road Mobile Sources | 50.33 | 197.14 |
| Off-Road Mobile Sources | 90.83 | 106.36 |
| Total | 567.04 | 493.41 |

Table 4.4
2020 Chicago Ozone Nonattainment Area
VOM and NOx Emissions

(Emissions stated in tons per ozone season weekday)

| Source Category | VOM | NOx |
|-------------------------|--------|--------|
| Point Sources | 67.63 | 171.13 |
| Area Sources | 385.73 | 40.57 |
| On-Road Mobile Sources | 37.98 | 116.69 |
| Off-Road Mobile Sources | 84.16 | 84.34 |
| Total | 575.50 | 412.73 |

Table 4.5
2025 Chicago Ozone Nonattainment Area
VOM and NOx Emissions

(Emissions stated in tons per ozone season weekday)

| Source Category | VOM | NOx |
|-------------------------|--------|--------|
| Point Sources | 72.79 | 180.13 |
| Area Sources | 406.96 | 41.35 |
| On-Road Mobile Sources | 41.85 | 108.93 |
| Off-Road Mobile Sources | 90.25 | 96.70 |
| Total | 611.85 | 427.11 |

4.4 Demonstration of Maintenance

Table 4.6 demonstrates that the level of emissions projected for the ten-year period following redesignation is sufficient to maintain the ozone NAAQS. As shown in the table, both VOM and NOx emissions within the nonattainment area are expected to decrease significantly between 2008 and 2025. Projected VOM and NOx emissions for the mid-point years, 2015 and 2020, are also less than the emission levels in 2008. Based on these emission trends it is expected that air quality will continue to meet the 8-hour ozone NAAQS throughout the maintenance period.

In addition to the overall emission reductions projected to occur within the nonattainment area, significant reductions of statewide NOx emissions resulting from implementation of Illinois' multi-pollutant standards affecting electric utilities by 2012, will also help to ensure continued attainment of the 8-hour ozone NAAQS.

TABLE 4.6
Comparison of 2008, 2015, 2020, and 2025 Emission Estimates
Chicago Nonattainment Area
(Emissions stated in tons per ozone season weekday)

| | 2008 | 2015 | Difference (2008 – 2015) | 2020 | Difference (2008 – 2020) | 2025 | Difference (2008- 2025) |
|-----------------------|-------------|-------------|---|-------------|---|-------------|--|
| VOM | 787.45 | 567.04 | 220.41 | 575.50 | 211.95 | 611.85 | 175.60 |
| NO_x | 896.76 | 493.41 | 403.35 | 412.73 | 484.03 | 427.11 | 469.65 |

4.5 Provisions for Future Updates

As required by Section 175A(b) of the CAA, Illinois commits to submit to U.S. EPA, eight years after redesignation, a revised version of this Maintenance Plan. The revision will contain Illinois' plan for maintaining the 8-hour ozone NAAQS for ten years beyond the first 10-year period after redesignation.

5.0 CONTROL MEASURES AND REGULATIONS

This section provides specific information on the control measures implemented in the Chicago nonattainment area, including the measures that were part of Illinois' Attainment Demonstration, Reasonable Further Progress (RFP) demonstration, CAA requirements, and other state and federal measures. The control measures required in past ozone SIP revisions have been fully implemented, and other, more recent control programs will continue to provide emission reductions in future years. Illinois EPA commits to keep these measures in effect after redesignation, or to provide equivalent emissions levels using alternate measures. Illinois' SIP contains acceptable provisions to provide for preconstruction review of new emission sources. After redesignation to attainment, Prevention of Significant Deterioration (PSD) requirements will apply to the construction of new major sources and to significant modifications of existing sources. Illinois has accepted delegation from U.S. EPA of this program. Illinois further commits to continue to require that all future transportation plans in the Chicago area conform with the SIP.

5.1 Attainment Demonstration Control Measures

Illinois' attainment demonstration for the Chicago nonattainment area identifies control measures that have been promulgated at either the state or federal level that are sufficient to allow the Lake Michigan region, with the exception of Holland, MI, to meet the 1997 8-hour ozone NAAQS by the required attainment date. The attainment demonstration, which was submitted to U.S. EPA after a public hearing and public comment period, is described in the Illinois EPA's document: "Attainment Demonstration for the 1997 8-Hour Ozone National Ambient Air Quality for the Chicago Nonattainment Area" (Report Number AQPSTR 09-03, March 18, 2009). The primary emission reduction measures for demonstrating attainment of the ozone standard are as follows:

- NO_x SIP Call
- New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS)/Maximum Achievable Control Technology (MACT) Standards
- VOM Solvent Categories: Aerosol Coatings, Architectural and Industrial Maintenance (AIM) Coatings, Consumer Solvents
- Enhanced Vehicle Inspection & Maintenance Program
- Reformulated Gasoline
- Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements

- On-Highway Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements
- Federal Control Programs Incorporated into NONROAD Model (e.g., Nonroad Diesel Rule), plus Evaporative Large Spark Ignition and Recreational Vehicle Standards
- Tier 4 Nonroad Diesel Engine Standards and Diesel Fuel Sulfur Content Restrictions
- Marine Compression-Ignition Engine Standards and Locomotive Engine Standards
- Consent Decrees---Dynegy Midwest Generation, ConocoPhillips, CITGO, Exxon-Mobil, Marathon Ashland, Archer Daniels Midland

5.2 Reasonable Further Progress (RFP)

Since the Chicago region is classified as a moderate nonattainment area for the 8-hour ozone standard, a 15 percent net reduction in VOM emissions from 2002 levels was required by 2008 in order to meet the RFP requirement. The Illinois EPA did not rely on NO_x substitution to meet its 15 percent RFP reduction, relying solely on VOM emission reductions.

Reductions in VOM emissions are primarily achieved through implementation of the control measures listed in Section 5.1.

The RFP demonstration is contained in Illinois EPA's document: "Chicago Nonattainment Area 8-Hour Ozone Reasonable Further Progress Demonstration", (Report Number AQPSTR 09-05, March 18, 2009). The control measures identified in the RFP document, including those listed above, will result in a 15.7 percent reduction in VOM emissions from 2002 emissions levels by the year 2008. In addition, continuing reductions in 2009 and 2010 are estimated to result in year 2010 VOM emissions at 21.0 percent below 2002 levels. These emission reductions achieve the 15% RFP target for the Chicago nonattainment area.

5.3 Reasonably Available Control Technology (RACT)

Pursuant to Sections 172, 182(b) and (f) of the CAA, RACT is required for all existing major sources of the applicable criteria pollutant and its precursors (VOM and NO_x) located in NAAs. U.S. EPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological feasibility and economic reasonableness (70 *FR* 71612; November 29, 2005). The major source threshold for moderate NAAs is defined as 100 tpy. A source generally consists of several units that emit pollutants. The

sum of emissions from all units at the source determines if a unit is major and thus subject to RACT requirements.

RACT is not a new requirement under the CAA. Illinois previously addressed RACT requirements in the Chicago area in developing attainment plans for the 1-hour ozone standard. (See 35 Ill. Adm. Code Part 218) The Illinois EPA has evaluated the previously adopted regulations to determine if the RACT requirement is still being met for 8-hour ozone. The RACT requirement for NO_x was waived for the 1997 8-hour ozone standard, based on U.S. EPA's finding that additional NO_x reductions were not needed for the area to attain the standard.

Sections 172, 182(b)(2), and 182(f) of the CAA require implementation of RACT for sources that are subject to Control Techniques Guidelines (CTGs) that are promulgated by U.S. EPA. The U.S. EPA has issued CTGs defining RACT for those categories of sources that emit the greatest amounts of VOM emissions. Illinois EPA has proposed regulations to implement the revised CTGs issued by the U.S. EPA in 2006, 2007, and 2008. The 2006 CTG's addressed industrial cleaning solvents, offset lithographic printing and letterpress printing, flexible package printing, and flat wood paneling coatings. The 2007 CTG's address paper, film, and foil coatings, large appliance coatings, and metal furniture coatings. The 2008 CTG's address miscellaneous metal and plastic parts coatings, fiberglass boat manufacturing materials, miscellaneous industrial adhesives, and automobile and light-duty truck assembly coatings. Other than the above mentioned CTGs, Illinois has adopted applicable rules addressing all CTGs published by U.S. EPA for which there are existing sources in the Chicago NAA.

Non-CTG sources are defined as major VOM sources which are not subject to CTGs, but for which RACT is required. All major sources of ozone precursors located in the ozone NAA that are not subject to individual RACT rules are subject to a generic RACT rule. These rules apply to non-CTG sources that have the potential to emit 100 tons or more per year of VOM. Thus, Illinois has met the obligation to implement RACT on non-CTG VOM sources in the NAA.

It should be noted that other regulatory requirements also affect VOM emission sources within the Chicago ozone NAA. These include Maximum Achievable Control Technology (MACT), federal New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS). These programs satisfy the RACT requirements for specific source categories because these rules are more stringent than RACT. It is concluded from this review that Illinois' existing VOM RACT rules fulfill U.S. EPA's RACT requirements for VOM sources in the NAA.

As mentioned previously, the RACT requirement for NO_x was waived under the 1997 8-hour ozone NAAQS. Although the Illinois EPA has adopted NO_x RACT rules, the attainment demonstration for the Chicago NAA for the 1997 ozone NAAQS did not rely on emission reductions from the Illinois EPA's NO_x RACT rules. The reductions resulting from this program, when implemented, will help the area to maintain the NAAQS in future years.

5.4 Controls to Remain in Effect

Illinois will maintain all of the control measures listed in this Section to ensure maintenance of the 8-hour ozone NAAQS. Any revisions to the control measures included as part of the Maintenance Plan will be submitted as a SIP revision to U.S. EPA for approval, and will be accompanied by a showing that such changes will not interfere with maintenance of the NAAQS.

Illinois EPA has the necessary resources to enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of ozone precursors in the Chicago nonattainment area.

5.5 Provisions for Permitting New or Modified Emission Sources

Illinois has longstanding and fully implemented programs for the review of new major sources and significant modifications of existing sources. The Prevention of Significant Deterioration (PSD) program, which includes requirements for Best Available Control Technology (BACT) on major new sources or significant modifications of existing sources, will be applicable in the Chicago area once the area has been redesignated to attainment. Illinois has been delegated full authority to implement the PSD program by U.S. EPA.

5.6 Transportation Conformity

The purpose of this section is to describe and establish the Chicago nonattainment area motor vehicle emissions budgets associated with the 8-hour ozone Maintenance Plan SIP. Average summer weekday motor vehicle emissions budgets are being proposed for the attainment year, 2008, and the final year of the Maintenance Plan, 2025, for the precursor pollutants VOM and NO_x. Although the Maintenance Plan includes motor vehicle emissions estimates for the milestone years 2015 and 2020, these years are not being proposed as motor vehicle emissions budgets. The 2008 and 2025 budgets were developed consistent with the motor vehicle activity assumptions and emissions control strategies incorporated into the 8-hour ozone attainment demonstration analysis. The budgets reflect an emissions level determined using motor vehicle VMT and fleet mix provided by the Chicago Metropolitan Agency for Planning (CMAP) and are consistent with the emission levels used in the attainment demonstration.

A motor vehicle emissions budget is that portion of the total allowable emissions allocated to highway and transit vehicle use that are defined in the SIP for a certain year. The rules governing transportation conformity require certain transportation activities to be consistent with motor vehicle emissions budgets contained in control strategy implementation plans (40 CFR § 93.118). Section 93.101 of the rule defines a “control strategy [State] implementation plan revision” as a “plan which contains specific strategies for controlling the emissions and reducing ambient levels of pollutants in order to satisfy CAA requirements of reasonable further progress and attainment.” In order to

demonstrate conformity to the motor vehicle emissions budget, emissions from the implementation of a transportation plan or a transportation improvement program must be less than or equal to the budget level (40 CFR § 93.118(a)).

The motor vehicle emissions budgets established and described herein were developed consistent with the methodology and control strategy assumptions used in the 8-hour ozone attainment demonstration. The effects of motor vehicle control measures are incorporated into the emissions factors produced by the U.S. EPA's MOVES model. These control measures include motor vehicle emissions standards, the operation of a vehicle inspection and maintenance (I/M) program, and the required use of reformulated gasoline and low sulfur gasoline and diesel fuel.

The Maintenance Plan emissions analysis summarized in Table 4.6 estimates that VOM and NOx emissions will be 175.60 and 469.65 tons per day, respectively, less in 2025 than the 2008 attainment year emissions levels. The transportation conformity regulations (40 CFR § 93.118(a)) allow the addition of a portion of this "safety margin" to the motor vehicle emissions estimates. As year 2025 emissions levels are projected to be substantially less than the attainment year 2008 emissions, a 15% safety margin is being proposed to be added to the 2025 estimated motor vehicle emissions to make up the motor vehicle emissions budget. The 15% increase would equate to an increase of 6.28 tpd of VOM and 16.34 tpd of NOx.

The motor vehicle emissions budgets, which reflect the VMT, control program assumptions and safety margin are listed in Table 5.1.

Table 5.1

**Proposed Chicago 8-hour Ozone Maintenance Plan
2008 and 2025
Motor Vehicle Emissions Budgets
(tons per ozone season weekday)**

| | Estimated Emissions | | Safety Margin | | Motor Vehicle Emissions Budgets | |
|------|---------------------|--------|---------------|-------|---------------------------------|--------|
| Year | VOM | NOx | VOM | NOx | VOM | NOx |
| 2008 | 117.23 | 373.52 | -- | -- | 117.23 | 373.52 |
| 2025 | 41.85 | 108.93 | 6.28 | 16.34 | 48.13 | 125.27 |

Complete details on the derivation of the motor vehicle emissions budgets, including discussion of the MOVES model inputs and assumptions are included in Appendix B of this report.

6.0 CONTINGENCY MEASURES

6.1 Contingency Measures

Section 175(A) of the CAA specifies the requirements for maintenance plans, including provisions for contingency measures that will be implemented if violations of the 8-hour ozone NAAQS are measured after redesignation to attainment. A list of potential contingency measures that would be implemented in such an event should also be included in the Maintenance Plan. Finally, the plan should provide a commitment to submit a revised maintenance plan eight years after redesignation to ensure continued maintenance for the next ten-year maintenance period.

Contingency measures are intended to provide further emission reductions in the event that violations of the 8-hour ozone NAAQS occur after redesignation to attainment. While these measures do not need to be fully adopted by the IPCB prior to the occurrence of NAAQS violations, the contingency plan should ensure that the contingency measures are adopted expeditiously once they are triggered. The Maintenance Plan must identify the triggers that determine when contingency measures will be adopted, and the measures that the state will consider.

Illinois EPA's contingency plan for the Chicago NAA is described in Table 6.1. Consistent with this plan, Illinois agrees to adopt and implement, as expeditiously as is practicable, the necessary corrective actions in the event that violations of the 8-hour ozone NAAQS occur within the Chicago maintenance area after redesignation to attainment. Further, Illinois commits to continue to implement the control measures identified in the attainment demonstration and RFP demonstration. As described in Section 5.0 of this report, Illinois has adopted and is continuing to implement a range of control measures that will greatly reduce precursor emissions, both locally and statewide. The contingency plan anticipates that these emission reductions will be sufficient to mitigate exceedances or violations of the NAAQS that may occur in the coming years without further regulatory action.

The contingency plan provides for different levels of corrective responses should ambient 8-hour ozone levels exceed the NAAQS in any year, if emissions in the NAA increase significantly above current attainment levels, or if the NAAQS is violated. A Level I response would occur in the event that: 1) the fourth highest 8-hour ozone concentration at any monitoring site in the Chicago NAA exceeds 84 ppb in any year, or 2) if VOM or NO_x emissions increase more than 5% above the levels contained in the attainment year (2006) emissions inventory. It should be noted that U.S. EPA does not require a state to implement contingency measures when occasional exceedances are recorded. Illinois EPA's voluntary commitment to initiate a Level I response is intended to prevent future violations of the NAAQS from ever occurring.

Illinois commits to compiling VOM and NO_x emissions inventories every three years for the duration of the Maintenance Plan to facilitate the emissions trends analysis included

Table 6.1
Contingency Plan for the Chicago 8-Hour Ozone Nonattainment Area

| Contingency Measure Trigger | Action to be Taken | List of Potential Contingency Measures |
|---|--|--|
| <u>Level I Trigger</u> <ul style="list-style-type: none"> Fourth highest monitored 8-hour average ozone concentration exceeding 84 ppb in any year at any monitoring station in the Chicago maintenance area. The Chicago maintenance area's NO_x or VOM emissions inventories increase more than 5% above the levels included in the 2006 emissions inventories. | <p>IL will evaluate air quality, or determine if adverse emissions trends are likely to continue. If so, IL will determine what and where controls may be required, as well as level of emissions reductions needed, to avoid a violation of the NAAQS. The study shall be completed within 9 months. If necessary, control measures shall be adopted within 18 months of determination and implemented as expeditiously as practicable, taking into consideration the ease of implementation and the technical and economic feasibility of the selected measures.</p> | <p>Point Source Measures</p> <ul style="list-style-type: none"> IL Multi-Pollutant Program for electric generating units NO_x RACT Clean Air Transport Rule, after promulgation by USEPA Best Available Retrofit Technology (BART) Broader geographic applicability of existing measures <p>Mobile Source Measures</p> <ul style="list-style-type: none"> Tier 2 Vehicle Standards and Low Sulfur Fuel Heavy Duty Diesel Standards and Low Sulfur Diesel Fuel High-enhanced I/M (OBDII) Federal railroad/locomotive standards Federal commercial marine vessel engine standards Portable fuel containers <p>Area Source Measures</p> <ul style="list-style-type: none"> Architectural/Industrial Maintenance (AIM) Coatings Commercial and Consumer Products Aerosol coatings |
| <u>Level II Trigger</u> <ul style="list-style-type: none"> A violation of the NAAQS at any monitoring station in the Chicago maintenance area. | <p>IL will conduct a thorough analysis to determine appropriate measures to address the cause of the violation. Analysis shall be completed within 6 months. Selected measures shall be implemented within 18 months of a violation.</p> | |

in the contingency plan under Level I. Illinois will coordinate with LADCO and other Lake Michigan states to evaluate the causes of high ozone levels or the emissions trends and to determine appropriate control measures needed to assure continued attainment of 8-hour ozone NAAQS. Under Level I, measures that could be implemented in a short time would be selected so as to be in place quickly after the Illinois EPA is aware that corrective measures have been triggered. Control measures selected under Level I will be adopted in most cases within 18 months after a determination is made, and implemented, generally, within 24 months of adoption by the IPCB.

A Level II response would be implemented in the event that a violation of the 8-hour ozone NAAQS were to be measured at a monitoring site within the Chicago maintenance area. In order to select appropriate corrective measures, Illinois will work with LADCO and other Lake Michigan States to conduct a comprehensive study to determine the

causes of the violation and the control measures necessary to mitigate the problem. The analysis will examine the following factors:

- the number, location, and severity of the ambient ozone concentrations;
- the weather patterns contributing to ozone levels;
- potential, contributing emissions sources;
- the geographic applicability of possible contingency measures;
- emissions trends, including timeliness of implementation of scheduled control measures;
- current and recently identified control technologies;
- air quality contributions from outside the maintenance area.

Contingency measures will be selected from those listed in Table 6.1 or from any other measure deemed appropriate and effective at the time the selection is made. This list of contingency measures is comprehensive, and it is expected that only a few of these measures would be required. The selection between measures will be based upon cost-effectiveness, emission reduction potential, economic and social considerations, ease and timing of implementation, or other appropriate factors. Implementation of necessary controls in response to a Level II trigger will take place as expeditiously as possible, but in no event later than 18 months after Illinois makes a determination, based on quality-assured ambient data, that a violation of the NAAQS has occurred.

Adoption of additional control measures is subject to necessary administrative and legal processes. Illinois EPA will solicit input from all interested and affected persons in the area prior to selecting appropriate control measures. No contingency measure will be implemented without providing the opportunity for full public participation. This process will include publication of notices, an opportunity for public hearing, and other measures required by Illinois law.

6.2 Commitment to Revise Plan

As noted in Section 4.5 above, Illinois commits to review its Maintenance Plan eight years after redesignation, as required by Section 175(A) of the CAA. The Maintenance Plan revision is intended to ensure continued attainment of the 8-hour ozone NAAQS for an additional ten-year period.

6.3 Public Participation

In accordance with Section 110(a)(2) of the CAA, Illinois is required to have a public comment period and provide the opportunity for a public hearing on the Maintenance Plan prior to adoption. Public participation in the SIP process is provided for as follows:

- Notice of availability of the Maintenance Plan document and the time and date of the public hearing was published in the Chicago Sun Times on July 8, 2011.

- If requested, the public hearing to receive comments on the Chicago Maintenance Plan was scheduled for August 18, 2011, at 1:00 p.m. in the Sangamo Room at the Illinois EPA's Headquarters at 1021 N. Grand Ave. East, Springfield, Illinois.
- A 30-day public comment period was also available to receive comments on the Maintenance Plan. A summary of the comments received and Illinois EPA's responses thereto is included as part of the submittal to U.S. EPA.

6.4 Legal Authority to Implement and Enforce

The Maintenance Plan must contain a demonstration that the State of Illinois has the necessary legal authority to implement and enforce the measures relied upon to attain and maintain the NAAQS. Illinois has the legal authority to implement and enforce the requirements of this SIP submittal pursuant to the Illinois Environmental Protection Act.

7.0 CONCLUSIONS

The Chicago nonattainment area has attained the 8-hour ozone NAAQS established in 1997 and has complied with the applicable provisions of the Clean Air Act required of moderate ozone nonattainment areas. Illinois has submitted an attainment demonstration that was based on air quality modeling and contains enforceable control measures. Illinois has performed an analysis that demonstrates that the Chicago NAA has attained the 1997 8-hour ozone NAAQS and believes the air quality improvements are due to permanent and enforceable control measures. Supporting documentation is contained herein.

Illinois has prepared a Maintenance Plan that meets the requirement of the Clean Air Act. This Maintenance Plan provides for the continued attainment of the 1997 8-hour ozone NAAQS for a period of ten years after U.S. EPA has formally redesignated the area to attainment. This Maintenance Plan provides adequate contingency measures for potential, additional emission reductions in the event that future violations of the 8-hour ozone NAAQS are observed in the area.

Illinois has prepared a comprehensive emission inventory of the precursors of ozone completed for the “attainment” year 2008, and has prepared a projection of the emission inventory to a year at least 10 years following redesignation. These projections indicate that emissions levels in the Chicago nonattainment area will continue to remain much lower than emissions from the attainment year 2008 levels, thereby maintaining the ozone NAAQS in future years. Illinois commits to continue to operate an appropriate monitoring network to verify the maintenance of the attainment status once the area has been redesignated. Illinois EPA has the legal authority to implement and enforce all control measures.

Finally, the Maintenance Plan includes on-road motor vehicle emissions budgets for use in transportation conformity determinations to assure that any increases in emissions from this sector do not jeopardize continued attainment of the 8-hour ozone standard during the ten-year maintenance period. This Maintenance Plan has been prepared in accordance with the requirements specified in U.S. EPA’s guidance document, and additional guidance received from U.S. EPA staff.

APPENDIX A

Summary of Ambient Air Monitoring Data (2006-2008)

Table A.1
2006-2008 8-hour Ozone Design Values
for Monitors in the Lake Michigan Region

State of Illinois

| County | AQS Code | Site Name | Design Value | 4th High 2006 | 4th High 2007 | 4th High 2008 |
|---------------|-----------------|-------------------------|---------------------|----------------------|----------------------|----------------------|
| Cook | 170310001 | Alsip | 76 | 78 | 85 | 66 |
| Cook | 170310032 | Chicago (SWFP) | 74 | 75 | 82 | 67 |
| Cook | 170310064 | Chicago (U. of Chicago) | 70 | 70 | 79 | 63 |
| Cook | 170310072 | Chicago (Jardine) | 67 | 65 | 75 | 63 |
| Cook | 170310076 | Chicago (ComED) | 73 | 75 | 80 | 66 |
| Cook | 170311003 | Chicago (Taft) | 73 | 77 | 79 | 64 |
| Cook | 170311601 | Lemont | 75 | 70 | 85 | 71 |
| Cook | 170314002 | Cicero | 62 | 60 | 68 | 60 |
| Cook | 170314007 | Des Plaines | 66 | 65 | 78 | 57 |
| Cook | 170314201 | Northbrook | 69 | 68 | 76 | 65 |
| Cook | 170317002 | Evanston | 70 | 72 | 80 | 58 |
| DuPage | 170436001 | Lisle | 63 | 62 | 72 | 57 |
| Kane | 170890005 | Elgin | 66 | 62 | 75 | 61 |
| Lake | 170971002 | Waukegan | 71 | 71 | 81 | 63 |
| Lake | 170971007 | Zion | 72 | 68 | 80 | 69 |
| McHenry | 171110001 | Cary | 65 | 57 | 74 | 65 |
| Will | 171971011 | Braidwood | 66 | 68 | 71 | 60 |

State of Indiana

| County | AQS Code | Site Name | Design Value | 4th High 2006 | 4th High 2007 | 4th High 2008 |
|---------------|-----------------|----------------------|---------------------|----------------------|----------------------|----------------------|
| Elkhart | 180390007 | Bristol | 72 | 67 | 82 | 68 |
| Lake | 180890022 | Gary | 73 | 73 | 85 | 62 |
| Lake | 180890030 | Whiting | 77 | 81 | 88 | 62 |
| Lake | 180892008 | Hammond | 73 | 75 | 77 | 68 |
| La Porte | 180910005 | Michigan City | 69 | 75 | 73 | 59 |
| La Porte | 180910010 | La Porte | 70 | 69 | 78 | 65 |
| Porter | 181270026 | Valparaiso | 70 | 71 | 80 | 61 |
| St. Joseph | 181410010 | Potato Creek St Park | 69 | 69 | 75 | 63 |
| St. Joseph | 181410015 | South Bend | 61 | 58 | 67 | 58 |
| St. Joseph | 181411007 | Granger | 73 | 70 | 82 | 69 |

State of Michigan

| County | AQS Code | Site Name | Design Value | 4th High 2006 | 4th High 2007 | 4th High 2008 |
|-------------|-----------|--------------------|--------------|---------------|---------------|---------------|
| Allegan | 260050003 | Holland | 86 | 91 | 94 | 73 |
| Benzie | 260190003 | Frankfort/Benzonia | 76 | 80 | 82 | 66 |
| Berrien | 260210014 | Coloma | 78 | 76 | 86 | 73 |
| Cass | 260270003 | Cassopolis | 75 | 73 | 83 | 71 |
| Kalamazoo | 260770008 | Kalamazoo | 73 | 68 | 81 | 70 |
| Kent | 260810020 | Grand Rapids | 77 | 82 | 84 | 66 |
| Kent | 260810022 | Evans/Oakfield | 78 | 81 | 85 | 69 |
| Leelanau | 260890001 | Peshawbestown | 71 | 73 | 79 | 62 |
| Manistee | 261010922 | Manistee | 77 | 83 | 83 | 65 |
| Mason | 261050007 | Scottville | 75 | 76 | 83 | 68 |
| Missaukee | 261130001 | Houghton Lake | 71 | 73 | 76 | 66 |
| Muskegon | 261210039 | Muskegon | 82 | 90 | 86 | 72 |
| Ottawa | 261390005 | Jenison | 79 | 83 | 88 | 67 |
| Schoolcraft | 261530001 | Seney | 75 | 76 | 85 | 64 |

State of Wisconsin

| County | AQS Code | Site Name | Design Value | 4th High 2006 | 4th High 2007 | 4th High 2008 |
|------------|-----------|------------------------|--------------|---------------|---------------|---------------|
| Brown | 550090026 | Green Bay | 70 | 66 | 82 | 63 |
| Door | 550290004 | Newport Beach | 80 | 79 | 92 | 69 |
| Kenosha | 550590019 | Chiwaukee | 78 | 79 | 85 | 72 |
| Kewaunee | 550610002 | Kewaunee | 75 | 77 | 85 | 65 |
| Manitowoc | 550710007 | Manitowoc (Two Rivers) | 75 | 78 | 85 | 64 |
| Milwaukee | 550790010 | Milwaukee (16th St.) | 63 | 64 | 67 | 60 |
| Milwaukee | 550790026 | DNR SE Region | 68 | 68 | 75 | 63 |
| Milwaukee | 550790041 | Milwaukee (UWM-North) | 72 | 73 | 78 | 65 |
| Milwaukee | 550790085 | Milwaukee (Bayside) | 75 | 73 | 83 | 69 |
| Ozaukee | 550890008 | Grafton | 72 | 71 | 82 | 64 |
| Ozaukee | 550890009 | Harrington Beach | 74 | 72 | 84 | 67 |
| Racine | 551010017 | Racine | 71 | 71 | 77 | 65 |
| Sheboygan | 551170006 | Sheboygan | 82 | 83 | 88 | 75 |
| Walworth | 551270005 | Lake Geneva | 70 | 72 | 75 | 64 |
| Washington | 551310009 | Slinger | 65 | 66 | 71 | 60 |
| Waukesha | 551330027 | Waukesha | 66 | 67 | 72 | 60 |

APPENDIX B

Chicago 8-Hour Ozone Maintenance Plan Transportation Conformity Motor Vehicle Emissions Budget Documentation

TRANSPORTATION CONFORMITY

This section describes the development of the Chicago nonattainment area motor vehicle emissions budgets associated with the revised Maintenance Plan for the 1997 8-hour NAAQS. Average summer weekday motor vehicle emissions budgets are being proposed for the attainment year, 2008, and for the Maintenance Plan end year 2025 for the ozone precursor pollutants volatile organic material (VOM) and oxides of nitrogen (NO_x). These budgets were developed consistent with the motor vehicle activity assumptions and emissions control strategies incorporated into the Chicago 8-hour ozone Attainment Demonstration analysis. The enclosed budgets were developed using the inventory method of the United States Environmental Protection Agency's (U.S.EPA) MOVES2010 (MOVES) model. The MOVES model incorporates local inputs such as annual vehicle miles of travel, vehicle fleet characteristics, meteorological conditions and vehicle and fuel emission control programs.

Background

Section 176(c)(4) of the Clean Air Act Amendments of 1990 requires that transportation plans, programs, and projects which are funded or approved under Title 23 of the United States Code (USC) must be determined to conform with State or Federal air implementation plans. A motor vehicle emissions budget is that portion of the total allowable emissions allocated to highway and transit vehicle use that are defined in the implementation plan for a certain year. Section 93.101 of the rule defines a "control strategy [State] implementation plan revision" as a "plan which contains specific strategies for controlling the emissions and reducing ambient levels of pollutants in order to satisfy Clean Air Act (CAA) requirements of reasonable further progress and attainment." In order to demonstrate conformity to the motor vehicle emissions budget, emissions from the implementation of a transportation plan or a transportation improvement program (TIP) must be less than or equal to the budget level (40 CFR § 93.118(a)).

Transportation conformity will be determined based on these proposed on-road motor vehicle emissions budgets after the U.S. Environmental Protection Agency (U.S. EPA) determines that the budgets meet the adequacy criteria of the transportation conformity rule under §93.118(e). The motor vehicle emissions budgets in this submittal are adequate as each of the six criteria under §93.118(e) is satisfied. These six criteria include:

1. The submitted control strategy implementation plan revision or Maintenance Plan was endorsed by the Governor (or his or her designee) and was subject to a State public hearing.
2. Before the control strategy implementation plan or Maintenance Plan was submitted to U.S. EPA, consultation among federal, State, and local agencies occurred; full implementation plan documentation was provided to U.S. EPA; and U.S. EPA's stated concerns, if any, were addressed;

3. The motor vehicle emissions budget(s) is clearly identified and precisely quantified;
4. The motor vehicle emissions budget(s), when considered together with all other emissions sources, is consistent with all applicable requirements for reasonable further progress, attainment, or maintenance (whichever is relevant to the given implementation plan submission);
5. The motor vehicle emissions budget(s) is consistent with and clearly related to the emissions inventory and the control measures in the submitted control strategy implementation plan revision or Maintenance Plan, and
6. Revisions to previously submitted control strategy implementation plans explain and document any changes to previously submitted budgets and control measures, impacts on point and area source emissions; any changes to established safety margins; and reasons for the changes (including the basis for any changes related to emissions factors or estimates of vehicle miles traveled).

This State Implementation Plan (SIP) and the associated motor vehicle emissions budgets have been developed by the Illinois Environmental Protection Agency (Illinois EPA), the designated air quality agency for the State of Illinois. The required public hearing to accept public comment on the proposed Maintenance Plan and associated motor vehicle emissions inventory was held on December 16, 2008 in Room 9-031 of the James R. Thompson Center in downtown Chicago. Notification of this hearing was printed in the Chicago Sun Times on November 15, 2008. Comments on the proposed attainment demonstration and motor vehicle emissions budgets were accepted for 30 days after the public hearing. A "Responsiveness Summary" which addresses the written comments received was prepared and is included in the final submission.

Notification of the revised Maintenance Plan and associated MOVES-based motor vehicle emissions budgets will be placed in the official 2011 state newspaper, the ~~XXXXXXXX XXXXXX~~, and on the Illinois EPA's web site on July ~~XX~~, 2011. Comments will be accepted for 30 days. A public hearing will be held on August 18, 2011 at the Illinois EPA offices in Springfield, if requested. All comments will be addressed in a "Responsiveness Summary" which will be included in the final submission to the U.S. EPA.

In compliance with criterion #2 above, a Tier 2 Conformity Consultation Team meeting was held on January 30, 2009 to discuss the proposed Maintenance Plan and associated motor vehicle emissions budgets. The Consultation Team includes representatives from the Federal Highway Administration, Federal Transit Authority, U.S. EPA, Chicago Metropolitan Agency for Planning (CMAP), Illinois Department of Transportation (IDOT), Regional Transportation Authority, and the Illinois EPA. In addition, the development of the Maintenance Plan was discussed at length by the LADCO Project Team, which includes a representative from the U.S. EPA Region V office. The draft Maintenance Plan was also forwarded to the Region V representative for his review and

comment. A follow-up meeting of the Tier 2 Conformity Consultation Team to discuss the revised MOVES-based motor vehicle emissions budgets was held at the CMAP on June 28, 2011.

The motor vehicle emissions budgets proposed and described herein were, in compliance with adequacy criterion #5, developed consistent with the methodology and control strategy assumptions used in the Chicago 1997 8-hour Ozone Attainment Demonstration and associated Reasonable Further Progress (RFP) plan. The effects of these controls are incorporated into the emissions estimates produced by the MOVES model. In response to adequacy criteria #4 and #6, the narrative of the Chicago 8-hour Ozone Maintenance Plan discusses the emissions estimates from other sectors and any changes in regulations. Following, in response to adequacy criteria #3, is a discussion of the inputs and assumptions incorporated into the development of the proposed Maintenance Plan motor vehicle emissions budgets.

Vehicle Miles Travelled: The attainment year 2008 motor vehicle emissions estimates contained Chicago 8-hour ozone Maintenance Plan incorporate county-and township-level 2008 annual vehicle miles traveled (VMT) levels from the Illinois Department of Transportation (IDOT). The 2008 annual VMT total for the 6-county-3-township Chicago NAA was approximately 58.8 billion miles. For future year emission estimates, VMT was grown to the target year at a compound growth rate of 1.5% per year. Applying this growth factor to the 2008 VMT level yields future year annual VMT projections of 65.2 billion for 2015, 70.3 billion for 2020, and 75.7 billion for 2025.

Meteorological Data: U.S. EPA guidance for the use of the MOVES model requires the use of representative local temperature and absolute humidity data. Average 2008 maximum and minimum monthly temperatures for the region were obtained from the National Weather Service local climatological data (LCD) for O'Hare International Airport. Absolute humidities corresponding to the average temperatures were calculated from LCD information as well. These 2008 temperatures and absolute humidity values, shown below, were used in the year 2025 emissions modeling.

| 2008 Minimum and Maximum Temperatures for Chicago, from O'Hare NWS Data | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|
| Month | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
| Min, (°F) | 15 | 16 | 27 | 39 | 45 | 61 | 64 | 64 | 57 | 47 | 32 | 14 |
| Max, (°F) | 32 | 30 | 43 | 60 | 66 | 81 | 84 | 82 | 75 | 62 | 46 | 32 |
| 2008 Absolute Humidity Corresponding to the Temperatures Above | | | | | | | | | | | | |
| Month | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
| AH, grains/lb | 17 | 14 | 21 | 34 | 41 | 73 | 83 | 74 | 71 | 39 | 25 | 15 |

Motor Vehicle Emissions Controls: Beyond the U.S. EPA's federal motor vehicle control program emissions standards, the primary local motor vehicle emissions control

programs that were in place in the Chicago NAA in 2008, and are projected to still be required in 2025 are a vehicle inspection and maintenance (I/M) program and the required use of reformulated gasoline (RFG).

Inspection and Maintenance (I/M): The Illinois I/M program in effect since 2007 requires biennial On-Board Diagnostics II (OBD) testing on all model year (MY) 1996 and newer (MY96+) light-duty gasoline vehicles (cars and light-duty trucks), and biennial exhaust idle and gas cap testing on MY96+ heavy duty gasoline vehicles including gasoline-powered buses, registered in the I/M testable area. Motorcycles and diesel vehicles are not subject to I/M. The program includes a 4-year grace period for new vehicles. This post-2007 I/M program was established when the Illinois legislature amended the Illinois Vehicle Inspection law in 2005 to (a) end dynamometer testing of vehicles, (b) require an OBD-based program beginning in February 2007, and (c) remove the requirement for testing compliant pre-MY96 vehicles.

The Chicago I/M program vehicle testing domain includes the urbanized areas in the Chicago NAA. An “I/M Coverage” percentage was developed based on the amount of VMT from vehicles subject to the inspection program compared to total area VMT. The I/M Coverage percentage for the Chicago 8-hour ozone NAA is 91.5%.

Fuels: The use of federal RFG has been required in the Chicago NAA since 1995. The 8-hour ozone Attainment Demonstration and original Maintenance Plan assumed the use of northern grade RFG in 2008 and beyond. RFG was and is assumed to contain 10% ethanol. The MOVES model can account for other fuels, such as E85, natural gas, methanol, etc, but for all practical purposes the gallons of such alternative fuels and hence the number of vehicles using them is very small compared to the number of gasoline and diesel vehicles, therefore, the use of such fuels was not considered.

Gasoline Sulfur: The federal Tier 2 regulations require gasoline sulfur levels to average no greater than 30 parts per million (ppm) with a maximum of 80 ppm beginning in 2007. There are no Illinois gasoline sulfur requirements, therefore, the MOVES default gasoline sulfur levels were used in the emissions modeling.

Diesel Sulfur: The federal Tier 2 regulations limit the level of sulfur in diesel fuel requiring on- highway diesel fuel to 15 ppm beginning in 2006. There are no Illinois diesel sulfur requirements, therefore, the MOVES default diesel sulfur levels were used in the emissions modeling.

Fuel Volatility: The volatility of summer RFG, measured as Reid vapor pressure (RVP), is not specifically regulated. However, a fuels’ RVP is one of the primary characteristics controlled by refiners in order to meet the RFG performance standards. The MOVES model contains default RVP levels for different seasons of the year based on fuel compliance testing. Therefore, the MOVES default RVP levels were used in the emissions modeling.

Vehicle Registration Distribution: A Chicago area-specific vehicle registration distribution (RD) profile based upon 2008 information data was developed by Illinois EPA's Division of Mobile Source Programs from vehicle age data for 2008 provided by the Illinois Secretary of State's Department of Motor Vehicles. The RD is the fraction of vehicles of a given vehicle type and age in the fleet of vehicles of that type as a whole. Different vehicle types have different RDs. Chicago-area RDs generally show fewer older vehicles than the nationwide average or default, because vehicles in the Chicago area tend to wear out faster than they do in the rest of the country due to rust from road salt and heavy city driving.

Source Type Population represents the number of vehicles of each MOVES vehicle type in the fleet as a whole within the area under consideration. Accurate local source-type populations were not available; therefore the MOVES default fractions modified by VMTs by vehicle type were used.

VMT Temporal Fractions are the VMT fractions of annual VMT by month of the year, of weekly VMT by day of the week, and daily VMT by hour of the day. The Illinois EPA uses temporal fractions derived from data collected from continuous count stations and presented by IDOT. Temporal fractions vary by road type.

Speed distributions are the fractions of VMT on a given road type by given vehicle types in various speed ranges (bins). Thus, on a typical Urban Arterial, a small fraction of the vehicles are traveling at less than 10 mph (plus or minus 5 mph), more at 20 mph, more at 30mph, most at 40 mph, less at 50 mph, and so on. These fractions differ by hour of the day—in more congested conditions during rush hours, the maximum fraction might be in the 30 mph range rather than the 40 mph range. MOVES uses speed distributions when aggregating emissions (or emission rates) for vehicles at different speeds. The Illinois EPA used the speed distributions derived from the CMAP transportation demand model.

Ramp fraction is the fraction of total VMT on limited-access highways such as Interstates that is from on- and off-ramps to or from those highways. Driving on limited-access highways is more or less at uniform speed, but driving on ramps involves considerable acceleration and deceleration; and these speed changes affect emissions. The default MOVES Ramp Fractions are 15% on Rural Interstates, 10% on Urban Interstates, and 2% on Other Freeways and Expressways. Illinois does not have actual or observed Ramp Fraction data; therefore the MOVES default values were used.

Road Type Distribution is the (fraction of) VMT on different road categories within an area under consideration. The Illinois EPA uses VMT data by HPMS functional class (FC) published by IDOT as the basis of its emission calculations. The Road Type Distribution for Rural Interstates in a county is the county's Rural Interstate VMT divided by the county's total all-road-type VMT. Similar calculations can be made for MOVES road types and vehicle types.

Safety Margin

The U.S. EPA's transportation conformity regulations allow for the use of a safety margin in the development of motor vehicle emissions budgets for Maintenance Plans. A Safety Margin is defined as "the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance."

According to table 4.6, VOM and NO_x emissions for the end of the maintenance plan year 2025 are 175.60 and 469.65 tons per day, respectively, less than the year 2008 attainment year levels. As year 2025 emissions levels are projected to be substantially less than the attainment year 2008 emissions, a 15% safety margin is being proposed to be added to the 2025 estimated motor vehicle emissions to make up the motor vehicle emissions budget. The 15% increase would equate to an increase of 6.28 tpd of VOM and 16.34 tpd of NO_x.

Motor Vehicle Emissions Budgets

Using the emissions generated by the MOVES model inventory methodology and incorporating the additional emissions from the Maintenance Plan safety margin, following are the proposed attainment year 2008 and Maintenance Plan end year 2025 Chicago 8-hour ozone motor vehicle emissions budgets for use in determining transportation conformity.

Proposed Chicago 8-hour Ozone Maintenance Plan 2008 and 2025

Motor Vehicle Emissions Budgets (tons per ozone season weekday)

| Year | Estimated Emissions | | Safety Margin | | Motor Vehicle Emissions Budgets | |
|-------------|----------------------------|-----------------------|----------------------|-----------------------|--|-----------------------|
| | VOM | NO_x | VOM | NO_x | VOM | NO_x |
| 2008 | 117.23 | 373.52 | -- | -- | 117.23 | 373.52 |
| 2025 | 41.85 | 108.93 | 6.28 | 16.34 | 48.13 | 125.27 |