

Analysis of Technical Information for Illinois 8-Hour Ozone Designation 120 Day Letters

The following is a list of the metropolitan areas in Illinois monitoring violations of the 8-hour ozone standard or contributing to such a violation and a summary of the analysis performed on Illinois' 8-hour ozone designation recommendations. Additional data are available as part of the docket (i.e., tables and charts summarizing relevant data as well as the Illinois ozone designation recommendations submittal).

Chicago-Gary-Lake County IL-IN Area

The Chicago-Gary-Kenosha IL-IN-WI Consolidated Metropolitan Statistical Area (CMSA) contains the Illinois Counties of Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, McHenry, and Will (the Indiana and Wisconsin portions of the CMSA are being addressed in separate reviews and letter responses).

Illinois EPA Recommendation:

The Illinois Environmental Protection Agency (Illinois EPA) recommended that the 8-hour ozone nonattainment area also be identical to be the 1-hour ozone nonattainment area. This area includes the Illinois Counties of Cook, DuPage, Kane, Lake, McHenry, and Will and Aux Sable and Goose Lake Townships in Grundy County and Oswego Township in Kendall County.

Issue:

Accepting the Illinois recommendation will result in a nonattainment area smaller than the presumptive nonattainment area, the entire Chicago-Gary-Kenosha IL-IN-WI CMSA. Illinois has recommended the exclusion of DeKalb and Kankakee Counties and portions of Grundy and Kendall Counties from the 8-hour ozone nonattainment area.

EPA 120 Day Response Letter:

EPA intends to accept Illinois EPA's recommendation to designate less than the presumptive boundary by designating as nonattainment for the 8-hour ozone standard the same area designated as nonattainment for the 1-hour ozone standard, excluding DeKalb and Kankakee Counties and portions of Grundy

and Kendall Counties, retaining as nonattainment the portions of Kendall and Grundy Counties designated as nonattainment of the 1-hour ozone standard.

Technical Analysis:

This is a summary of how the 11 factors contained in EPA's designation boundary guidance are addressed by the Illinois EPA or by additional data reviewed by the EPA. Bold text indicates additional information reviewed and summarized by the EPA (in addition to the information supplied by the Illinois EPA). Copies of the base data are included in the docket. Only those areas to be excluded from the 8-hour ozone nonattainment area's presumptive boundaries are addressed here. Illinois also addressed data for counties and partial counties to be included in the 8-hour nonattainment area, as noted in Illinois EPA's recommendation submittal, included in the docket.

1) Emissions:

Illinois EPA noted that the Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NOx) emissions in the excluded counties are the following: Kankakee County (28.96 tons/day (TPD) VOC and 40.46 TPD NOx); Grundy County (15.24 TPD VOC and 24.50 TPD NOx); Kendall County (9.39 TPD VOC and 11.62 TPD NOx); and DeKalb County (21.77 TPD VOC and 10.92 TPD NOx). These emissions are relatively small compared to the total emissions of the Illinois portion of the recommended nonattainment area (769.63 TPD VOC and 1,055.22 TPD NOx). **To assess the total impact of the exclusion of these areas, the annual emissions contained in the 1999 National Emissions Inventory (NEI) have also been considered.**

The 1999 total annual emissions for the CMSA are: 391,547 tons VOC and 361,762 tons NOx. The individual county emission totals and percentages of the 1999 CMSA emission totals are the following:

| County | VOC (TPY) | % of CMSA | NOx (TPY) | % of CMSA |
|-------------|-----------|-----------|-----------|-----------|
| DeKalb | 5,148 | 1.3 | 5,131 | 1.4 |
| Grundy (*) | 3,767 | 1.0 | 9,304 | 2.6 |
| Kankakee | 7,306 | 1.9 | 6,930 | 1.9 |
| Kendall (*) | 3,005 | 0.8 | 3,103 | 0.9 |

| | | | | |
|--------|--------|-----|--------|-----|
| Totals | 19,226 | 4.9 | 24,468 | 6.8 |
|--------|--------|-----|--------|-----|

(*) Total counties, including areas in 1-hour ozone nonattainment area.

VOC and NOx emissions for each of the "excluded" counties and the total emissions for all excluded counties are relatively small percentages of the emissions totals for the CMSAs. The remaining area within the nonattainment area would account for in excess of 90 percent of the CMSA emission totals.

2) Population Densities and Degree of Urbanization:

Illinois EPA has presented population density and land use maps showing that DeKalb, Grundy, Kankakee, and Kendall Counties are significantly less populated per unit area and significantly less urban than the area within the recommended 8-hour ozone nonattainment area. Illinois has also presented population densities by county in persons per acre showing that the population densities in the areas recommended for exclusion are significantly less than those in the remainder of the CMSA.

The populations, percentages of CMSA total population (8,376,601), and population densities for the individual counties are given below:

| County | 2000 Population | % of CMSA | Population Density (per Square Mile) |
|-------------|-----------------|-----------|---|
| DeKalb | 88,969 | 1.1 | 140 |
| Grundy (*) | 37,535 | 0.4 | 89 |
| Kankakee | 103,833 | 1.2 | 153 |
| Kendall (*) | 54,544 | 0.7 | 170 |
| Totals | 284,881 | 3.4 | 138.9 |

(*) Total counties, including areas in 1-hour ozone nonattainment area.

The degree of urbanization in the subject counties is minimal, and their populations are small percentages of the CMSA total population. The population densities are small compared to those of counties remaining in the nonattainment area, which range from 431 per square mile in McHenry County to 5,685 per square mile in Cook County.

3) Monitoring Data:

The monitoring data for 2000-2002 for the CMSA show that the 8-

hour ozone standard was violated in Cook County, Illinois, Kenosha County, Wisconsin, and Lake and Porter Counties, Indiana. Draft (pre-quality assured) data for 2001-2003 for the CMSA show that the 8-hour standard may have been violated in Cook and Lake Counties, Illinois, Kenosha County, Wisconsin, and Lake and Porter Counties, Indiana. Monitoring data for both 3 year periods show ozone design values (averages of fourth-high daily peak hour concentrations for 3 year periods) below the 8-hour standard exceedance cutoff (85 parts per billion) in DuPage, Kane, McHenry, and Will Counties.

No monitoring of ozone was conducted in DeKalb, Grundy, Kankakee, and Kendall Counties during the recent 3 year periods. It should be noted, however, that these counties adjoin other Illinois counties in the CMSA which have monitored attainment of the 8-hour ozone standard during these periods. At minimum, monitoring data do not lead to the conclusion that DeKalb, Grundy, Kankakee, and Kendall Counties "must" be part of the nonattainment area due to local monitored violations of the 8-hour standard.

4) Location of Emission Sources:

Mapping of the locations of major sources of VOC and NO_x (those sources emitting in excess of 100 tons/year of VOC and/or NO_x¹) for the Chicago area counties shows that major sources of VOC and NO_x are located in DeKalb, Grundy, Kankakee, and Kendall Counties. DeKalb County has only one major NO_x source.

Several of the major sources in Grundy and Kendall Counties are within the portions of the counties that Illinois is recommending be included in the 8-hour nonattainment area. Nonetheless, several major sources would remain outside of the recommended nonattainment area in both of these counties. One major electric generating unit in Grundy County is subject to the requirements of Illinois' NO_x emission control regulations for such units.

¹ The major source threshold for the current 1-hour nonattainment area is 25 tons/year of VOC or NO_x. For the purposes of this analysis, not knowing at this time what the classification of the Chicago area will be under the 8-hour ozone standard, it is assumed that a more useful major source cutoff is 100 tons/year, which can apply to lower nonattainment classification levels.

Three major sources of VOC and three major sources of NOx are located in Kankakee County. It is not clear that the major NOx sources in this county will be subject to Illinois' NOx emission control regulations. Nonetheless, as noted elsewhere in this analysis, the total ozone precursor emissions in Kankakee County are minimal compared to those in the 1-hour ozone nonattainment area and within the Illinois recommended 8-hour ozone nonattainment area.

5) Traffic and Commuting Patterns:

Illinois has provided Average Daily Vehicle Miles Travelled (ADVMT) data for each of the Illinois counties in the Chicago CMSA. These data show that the ADVMT in any of the counties considered for exclusion from the recommended 8-hour nonattainment area are less than half those of any of the counties in the recommended nonattainment area. The total ADVMT in the four excluded counties (8,601,288) is 5.3 percent of the total ADVMT in the Illinois portion of the CMSA. Therefore, the mobile source emissions in the counties subject to exclusion are a small percentage of the total mobile source emissions in the CMSA.

A significant portion (in excess of 90 percent) of the workers originating in DeKalb, Grundy, Kankakee, and Kendall Counties are commuting into the Chicago area for work each weekday.

6) Expected Growth:

According to the US Census, the expected growth in populations for the subject exclusion counties for the 2000-2010 period are: DeKalb County (8.2 percent); Grundy County (5.0 percent); Kankakee County (7.5 percent); and Kendall County (3.7 percent). Since the total 2000 population for all four counties is a small percentage of the total population for the Illinois portion of the CMSA, the populations of the subject exclusion counties are not expected to become a significant percentage of the CMSA total population through 2010. In fact, as other counties in the CMSA are growing at faster absolute rates (changes in population per unit time rather than percentage changes per unit time) (with the exclusion of Cook County, which is not appreciably growing during the 2000-2010 period) than DeKalb, Kankakee, Kendall, and Grundy Counties, the CMSA population fraction of the exclusion counties will decrease over the 2000-2010 time period.

Illinois has presented graphical representations of population growth for 1995-2020 and occupational employment growth for 1998-2008. These graphical data indicate that, in terms of absolute population and employment numbers, the growth in population and employment in the subject exclusion counties is expected to be significantly less than those in the counties in the State-recommended 8-hour nonattainment area.

7) Meteorology:

DeKalb, Grundy, Kankakee, and Kendall Counties are located south-west of the Chicago urban/industrial area. Therefore, these counties are generally upwind of the Chicago urban/industrial area on high ozone days in this area. The Chicago urban/industrial area would not be expected to cause ozone standard violations in DeKalb, Grundy, Kankakee, and Kendall Counties.

Based on meteorology alone, DeKalb, Grundy, Kankakee, and Kendall Counties are potential source areas for Chicago area high ozone levels. As explained elsewhere in this analysis, however, the emissions from these counties are a small fraction of the total ozone precursor emissions in the CMSA. Therefore, these counties are not expected to be significant source areas for the Chicago area high ozone concentrations, and peak ozone levels in the Chicago area are not expected to be significantly impacted through the control of emissions in these counties.

8) Geography:

The State did not address geography issues, and no geography issues are relevant in this area.

9) Jurisdictional Boundaries:

Illinois has recommended that the 8-hour ozone nonattainment area be identical to the 1-hour ozone nonattainment area.

10) Level of Emission Controls:

Illinois has not previously applied VOC controls on stationary sources in DeKalb and Kankakee Counties and those portions of Grundy and Kendall Counties outside of the 1-hour ozone nonattainment area. In addition, Illinois has not applied state-selected mobile source emissions in these areas. In response to the NOx State Implementation Plan (SIP) call, Illinois has adopted and EPA has approved major source NOx

emission control regulations that apply throughout Illinois.

11) Regional Emission Reductions:

Illinois has approved NOx emission control regulations under the NOx SIP call.

Region 5 Review:

No one factor is the basis for decisions on the designation boundaries. All of the 11 factors discussed above were considered to derive an opinion which best fits the facts. In the 120 day letter, we intend to agree with Illinois that DeKalb and Kankakee Counties may be designated as attainment (actually attainment/unclassifiable) of the 8-hour ozone standard. This conclusion is based on the relatively low emissions in these counties and the resulting conclusion that not including these counties in the nonattainment area will have little impact on the success of any future emission control strategy for the Chicago area. Any additional VOC emission controls in these counties are likely to have minimal impacts on ozone levels downwind of the Chicago area.

With regard to Grundy and Kendall Counties, the State has supplied insufficient data to allow us to conclude that the recommended nonattainment area would include the majority of the emissions in these counties. EPA believes that breathing unhealthful levels of ozone and ozone transport are a serious regional air pollution problem. Absent a convincing rationale that the excluded portions of Grundy and Kendall Counties are neither experiencing ozone standard violations nor contributing to a violation in the Chicago area, EPA policy would dictate that these counties be designated in their entirety as nonattainment (recognizing that the Illinois EPA has recommended that parts of these Counties be designated as nonattainment for the 8-hour ozone standard).

Illinois' submittal and other data sources, as discussed above, provide evidence that Grundy and Kendall Counties, as a whole and in conjunction with DeKalb and Kankakee Counties, are not a significant source area for ozone precursor emissions relative to the Illinois-recommended Chicago 8-hour ozone nonattainment area. In addition, although Grundy and Kendall Counties are not monitored for ozone, they are adjoining counties that are monitored as attaining the 8-hour ozone standard are not adjoining counties that are monitoring nonattainment of the 8-

hour ozone standard. This implies that Kendall and Grundy Counties may themselves be attaining the 8-hour ozone standard. It is noted, however, that the parts of Kendall (Oswego Township) and Grundy (Aux Sable and Goose Lake Townships) Counties the State recommends for inclusion in the 8-hour nonattainment area are the same portions of these counties included in the 1-hour ozone nonattainment area. Based on the fact that these portions of the Counties were part of the 1-hour ozone nonattainment area, we agree with the State's recommendation to include them as part of the 8-hour ozone nonattainment area. Designating these portions of Grundy and Kendall Counties as nonattainment for the 8-hour ozone standard is consistent with EPA's policy to designate 8-hour ozone nonattainment areas that, at minimum, include the original 1-hour ozone nonattainment areas.

St. Louis, MO-IL Area

The St. Louis, MO-IL CMSA contains the Illinois Counties of Clinton, Jersey, Madison, Monroe, and St. Clair. The Missouri portion of this area is being addressed in a separate review and letter response to the State of Missouri.

Illinois EPA Recommendation

Illinois recommended that the Illinois portion of the St. Louis, MO-IL 8-hour ozone nonattainment area include only Jersey, Madison, Monroe, and St. Clair Counties. Illinois recommended that Clinton County not be included in the nonattainment area.

Issue:

Accepting the Illinois recommendation will result in a nonattainment area smaller than the presumptive nonattainment area, the entire St. Louis MO-IL CMSA.

EPA 120 Day Response Letter:

EPA agrees with the Illinois EPA that Clinton County does not have to be included in the St. Louis, MO-IL 8-hour ozone nonattainment area.

Technical Analysis:

This is a summary of how the 11 factors in EPA's designation boundary guidance are addressed by the Illinois EPA or by additional data reviewed by the EPA. Bold text indicates additional information reviewed by the EPA in addition to the

data and documentation supplied by the State of Illinois. Only the exclusion of Clinton County from the possible 8-hour ozone nonattainment area is addressed here.

1) Emissions:

Illinois EPA noted that the VOC and NOx emissions in Clinton County are the following: 10.95 TPD VOC and 16.73 TPD NOx.

To assess the impact of excluding Clinton County, the annual emissions contained in the 1999 NEI have been considered for both the Illinois portion of the CMSA and the CMSA as a whole. The total annual VOC and NOx emissions for the Illinois portion of the CMSA are: 39,436 tons VOC and 60,043 tons NOx. The annual VOC and NOx emissions in the entire CMSA are: 156,100 tons VOC and 220,857 tons NOx. Since the annual emissions in Clinton County are: 2,442 tons VOC and 3,879 tons NOx, it can be seen that the emissions in Clinton County form the following percentages: Illinois Portion of CMSA (6.2 percent of the VOC emissions and 6.5 percent of the NOx emissions); and CMSA total (1.6 percent of the VOC emissions and 1.8 percent of the VOC emissions).

2) Population Densities and Degree of Urbanization:

Illinois EPA has provided population density and land use maps showing that Clinton County is significantly less populated per unit area and significantly less urban than the area within the recommended 8-hour ozone nonattainment area. Illinois has also presented population densities by county in persons per acre showing that the population density in Clinton County is significantly less than Madison and St. Clair Counties. The population density of Clinton County is 75 people per square mile based on the 2000 census. The population of Clinton County (35,535 based on the 2000 census) is 5.9 percent of the population of the Illinois portion of the CMSA and, obviously, a significantly smaller percentage of the total CMSA population.

3) Monitoring Data:

The monitoring data for 2000-2002 for the CMSA show that the 8-hour ozone standard was violated in Jersey and St. Clair Counties in Illinois, and in St. Charles and St. Louis Counties in Missouri. Draft (pre-quality assured) data for 2001-2003 for the CMSA show that the 8-hour standard may have been violated in Jersey and Madison Counties in Illinois and in St. Charles, St. Louis, and Jefferson Counties, and St. Louis City in Missouri.

No monitoring of ozone was conducted in Clinton County during the 2000-2002 and 2001-2003 periods. No conclusions can be drawn concerning possible peak ozone levels in Clinton County.

4) Location of Emission Sources:

Mapping of the locations of major sources of VOC and NO_x (those sources emitting in excess of 100 tons/year of VOC and/or NO_x) for the State of Illinois shows that two major sources of VOC are located in Clinton County. It is not clear whether these sources are currently controlled or will be ultimately controlled under Illinois VOC emission control regulations. Nonetheless, as noted elsewhere in this analysis, the total VOC emissions in Clinton County are a small percentage of the total VOC emissions in the Illinois portion of the CMSA and the CMSA as a whole.

5) Traffic and Commuting Patterns:

Illinois has provided ADVMT data for each of the Illinois counties in the Illinois portion of the CMSA. These data show that the ADVMT of Clinton County is 6.2 percent of the total ADVMT for the Illinois portion of the CMSA. The ADVMT of Clinton County would be an even smaller percentage of the ADVMT for the entire CMSA.

A significant portion (approximately 85 percent) of the workers originating in Clinton County appear to be commuting into the St. Louis urban area for work each weekday.

6) Expected Growth:

According to the US Census, the expected growth in population for Clinton County for the 2000-2010 period is 4.5 percent. Since the 2000 population for Clinton is relatively small and a small percentage of the population of the CMSA as a whole, the growth in population in Clinton County is not expected to lead to a significant increase in Clinton County emissions relative to those in the CMSA as a whole.

Illinois has presented graphical representations of population growth for 1995-2020 and occupational employment growth of 1998-2008. These graphical data indicate that, in terms of absolute population and employment numbers, the growth in population and employment in Clinton County are expected to be significantly less than those in the counties in the State-recommended 8-hour

nonattainment area.

7) Meteorology

Insufficient data are available to allow us to determine whether Clinton County is upwind from the violating monitors on the ozone exceedance days at these monitors.

8) Geography:

The State did not address geography issues for this area, and no known geographic features are relevant for this area.

9) Jurisdictional Boundaries:

Illinois has recommended that the 8-hour nonattainment area be identical to the 1-hour nonattainment area.

10) Level of Emission Controls:

Illinois has not previously applied VOC controls on stationary sources in Clinton County. In addition, it appears that there are no major NO_x sources in Clinton County that would be subject to Illinois' statewide NO_x emission control regulations.

11) Regional Emission Reductions

Illinois has statewide NO_x emission control rules for certain source categories. None of these rules may be applicable to NO_x sources in Clinton County.

Region 5 Review:

All of the 11 factors were reviewed in a cumulative manner. Based on these factors, particularly on the relatively small fraction of the CMSA emissions that originate in Clinton County, it is concluded that excluding Clinton County from the nonattainment area is appropriate.