

# **Illinois and Associated Areas in Missouri and Indiana Unclassifiable Area Designations for the 2012 Primary Annual PM<sub>2.5</sub> National Ambient Air Quality Standards Technical Support Document**

## **1.0 Summary**

In accordance with section 107(d) of the Clean Air Act (CAA), the EPA must promulgate designations for all areas of the country. In particular, the EPA must identify those areas that are violating a National Ambient Air Quality Standard (NAAQS) or contributing to a violation of the NAAQS in a nearby area. The EPA identifies these areas as “nonattainment” areas. Additionally, through the designation process, the EPA identifies areas that are meeting the NAAQS and those areas without sufficient data for the Agency to make a determination. The EPA uses a designation category of "unclassifiable/attainment" for areas where air quality monitoring data indicate attainment of the NAAQS and for areas that do not have monitors but for which the EPA has reason to believe are likely to be in attainment and are not contributing to nearby violations. The EPA reserves the category of "unclassifiable" for areas where the EPA cannot determine based on available information whether the area is meeting or not meeting the NAAQS or where the EPA has not determined that the area contributes to a nearby violation. The EPA must complete the initial area designation process within 2 years of promulgating a new or revised NAAQS, or may do so within 3 years under certain circumstances.<sup>1</sup> This Technical Support Document (TSD), in part, describes the rationale for EPA’s action to designate certain areas in Illinois and associated areas in Missouri and Indiana as unclassifiable for the 2012 primary annual fine particle NAAQS (2012 annual PM<sub>2.5</sub> NAAQS).<sup>2</sup>

Under section 107(d), states are required to submit area designation recommendations to the EPA for the 2012 annual PM<sub>2.5</sub> NAAQS no later than 1 year following promulgation of the NAAQS, or by December 13, 2013. On December 12, 2013, Illinois recommended that specified counties and portions of counties in the Illinois portions of the Chicago and St. Louis areas be designated as nonattainment, and that the remaining counties and portions of counties in the state be designated attainment/unclassifiable for the 2012 annual PM<sub>2.5</sub> NAAQS, based on air quality data from 2010 to 2012. Also on December 12, 2013, Indiana recommended that no counties within the state be designated nonattainment, and Indiana specifically recommended designating Lake, Porter, and LaPorte Counties as attainment based on monitoring data recorded within those counties. On December 10, 2013, Missouri recommended that no portion of Missouri be

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<sup>1</sup> Section 107(d) of the CAA requires the EPA to complete the initial designation process within 2 years of promulgation of a new or revised NAAQS, unless the Administrator has insufficient information to make initial designation decisions in the 2-year time frame. In such circumstances, the EPA may take up to 1 additional year to make initial area designation decisions (i.e., no later than 3 years after promulgation of the standard).

<sup>2</sup> On December 14, 2012, the EPA promulgated a revised primary annual PM<sub>2.5</sub> NAAQS (78 FR 3086, January 15, 2013). In that action, the EPA revised the primary annual PM<sub>2.5</sub> standard, strengthening it from 15.0 micrograms per cubic meter (µg/m<sup>3</sup>) to 12.0 µg/m<sup>3</sup>.

included in the St. Louis area and that all of the state be designated attainment/unclassifiable. On April 30, 2014, Iowa recommended that all counties in Iowa be designated as unclassifiable/attainment.

However, a recent EPA-conducted technical systems audit of the weighing of PM<sub>2.5</sub> samples in Illinois revealed that the Cook County Department of Environmental Control, which weighs all of the filters in Illinois’ monitoring network, did not have appropriate equipment for determining whether the laboratory conditions met the temperature and humidity criteria in 40 CFR 50 Appendix L for proper conditioning of filters, and the instantaneous temperature and humidity information suggested that many of the weighings failed to meet these criteria.<sup>3</sup> As a result, the EPA believes that no site in Illinois has sufficient valid data to support a determination of either nonattainment or attainment. Thus, the EPA cannot determine whether any area in Illinois is meeting or not meeting the NAAQS. Furthermore, EPA cannot rely upon analyses Illinois and other States performed which partially rely upon this invalid monitoring data. Because the EPA cannot make a final regulatory determination about whether a violation exists, in some cases the EPA is also not able to determine whether counties nearby to those counties with incomplete monitoring data contribute to a nearby violation. Consequently, the EPA intends to designate all of the affected areas as “unclassifiable.”

After considering Illinois’, Indiana’s, Iowa’s and Missouri’s recommendations, and based on the EPA’s assessment of available information as described in this TSD, EPA is designating the areas identified in Table 1 as unclassifiable for the 2012 annual PM<sub>2.5</sub> NAAQS. The CAA provides the EPA with discretion regarding whether and when to initiate a redesignation process. The EPA may consider air quality data, planning and control considerations, or any other air quality-related considerations the Administrator deems appropriate. As a result, the boundaries of any future actions may not be those that EPA uses to define the unclassifiable areas that EPA is promulgating now based on incomplete data.

**Table 1. EPA’s Designated Unclassifiable Areas for the 2012 annual PM<sub>2.5</sub> NAAQS**

Area	States’ Recommendations	EPA’s Designated Unclassifiable Counties
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<sup>3</sup> Memorandum dated August 14, 2014 from Liz Naess, Group Leader, Air Quality Analysis Group, US EPA Office of Air Quality Planning and Standards, to EPA Docket EPA-HQ-OAR-2012-0918, Air Quality Designations for the 2012 PM<sub>2.5</sub> Standards, titled, “Data Quality Issues in Illinois Affecting Air Quality Designations for the 2012 PM<sub>2.5</sub> National Ambient Air Quality Standard.”

Chicago, IL-IN	Illinois - Nonattainment for: Cook County DuPage County Kane County Lake County McHenry County Will County Grundy County (part) Kendall County (part) Indiana: Attainment	Illinois: Cook County DuPage County Kane County Lake County McHenry County Will County Grundy County (part) Kendall County (part) Indiana: Lake County Porter County
St. Louis, MO-IL	Illinois – Nonattainment for: Madison County Monroe County St. Clair County Randolph County (part) Missouri: Unclassifiable/Attainment for all counties	Illinois: Madison County Monroe County St. Clair County Randolph County (part) Missouri: St. Louis City St. Louis County St. Charles County Jefferson County Franklin County
Davenport-Moline-Rock Island, IL	Illinois – Unclassifiable/Attainment for: Rock Island County Henry County Mercer County Iowa – Unclassifiable/Attainment for: Scott County	Illinois: Rock Island County Henry County Mercer County Iowa: None - Scott County to be designated Unclassifiable/attainment
Remainder of Illinois	Unclassifiable/Attainment	Unclassifiable

### **Chicago Area**

Chicago is the primary city of a three-state MSA that includes fourteen counties: nine counties in Illinois, four counties in Indiana, and one county in Wisconsin. The consolidated statistical area (CSA) of which Chicago is the central city includes three additional MSAs (Kankakee, Michigan City-LaPorte, and Ottawa-Peru) with an additional five counties. The urbanized portion of this area includes substantial portions of the Chicago-Naperville-Elgin MSA, but the outer MSAs do not contain significant urbanization as compared to the central Chicago area. The Chicago area was designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. Based on analysis of air quality, emissions, meteorological data, and other factors considering in determining those prior designations, EPA promulgated a Chicago, IL-IN nonattainment area that includes almost the entirety of the Chicago-Naperville-Arlington Heights Metropolitan Division (Cook, Dupage,

McHenry, and Will Counties along with portions for Grundy and Kendall Counties) along with selected counties from adjoining Metropolitan Divisions of this MSA (Kane County from the Elgin area, Lake and Porter Counties from the Gary, Indiana area, and Lake County, Illinois from the Lake County-Kenosha County area). There are attaining monitors in Lake, Porter, and LaPorte Counties in Indiana and in Kenosha County in Wisconsin, as shown in Table 2. No data for Illinois are shown in Table 2 because no site in Illinois has sufficiently complete data for computing a reliable design value.

**Table 2. Air Quality Data collected at Regulatory Monitors (all DV levels in  $\mu\text{g}/\text{m}^3$ )<sup>a</sup>**

County, State	Monitor Site ID	State Rec NA?	09-11 DV	10-12 DV	11-13 DV
Lake, IN	18-089-0006	No	11.7	11.5	10.8
Lake, IN	18-089-0027	No	11.5	11.8	11.2
Lake, IN	18-089-0031	No	12.4	12.2	11.6
Lake, IN	18-089-2004	No	13.1	11.4	10.8
Lake, IN	18-089-2010	No	11.1	11	10.6
LaPorte, IN	18-091-0011	No	10.2	10.1	9.6
Porter, IN	18-127-0024	No	11.1	10.7	10.4
Kenosha, WI	55-059-0019	No	9.7	9.5	9.1

<sup>a</sup>Where a county has more than one monitoring location, the county design value is indicated in red type.

The TSD for the EPA's designation of the Chicago area for the 1997 standard provided an extensive review of air quality data, emissions data, population, motor vehicle travel, meteorology, and other related factors. While the Illinois air quality data are not sufficiently complete to provide a reliable indication of the magnitude of concentrations, the available air quality data suggest that the spatial distribution of exposure to PM<sub>2.5</sub> is similar to the distribution EPA found in 2005, when it promulgated the Chicago 1997 PM<sub>2.5</sub> nonattainment area. Furthermore, a review of the distribution of emissions, population, and vehicle travel also shows a similar distribution of these parameters, in both cases showing the greatest quantity of emissions, population, and vehicle travel in Cook County but showing substantial quantities of each of these parameters in the same list of surrounding counties. Conversely, EPA again finds that the surrounding counties that previously had low emissions continue to have low emissions, and the set of outer counties with moderate emissions that EPA previously found too distant and having insufficient emissions to be considered to be nearby contributors to the violations, such as Kankakee County, Illinois, and LaPorte County, Indiana, continue to be too distant and to have insufficient emissions to be considered to be nearby contributors to potential violations in the Chicago area. Similarly, EPA finds that Kenosha County, Wisconsin, continues to have moderate emissions that are prone to have more likely impacts elsewhere in Wisconsin and less likely to have impacts in Illinois, and the emissions are somewhat distant from potential violations in Illinois. This review therefore suggests that if the Chicago area is violating the NAAQS, the area that the EPA finds is contributing to that violation is the same area as EPA found in 2005 to contribute to violations of the 1997 PM<sub>2.5</sub> NAAQS.

Based on this analysis, the EPA is designating a Chicago, IL-IN unclassifiable area that includes the same area as was designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. Thus, the EPA is designating an unclassifiable area that includes Cook, Dupage, Kane, Lake, McHenry, and Will Counties as well as Aux Sable and Goose Lake Townships in Grundy County and Oswego Township in Kendall County in Illinois, and Lake and Porter Counties in Indiana. Other portions of Indiana are addressed in a TSD for the Louisville nonattainment area, and the EPA is designating the remainder of Indiana as unclassifiable/attainment. Since we find neither Kenosha County nor any other portion of Wisconsin as contributing to any potential violations in the Chicago area (or to violations in any other area), the entire State of Wisconsin is being designated as unclassifiable/attainment.

### **St. Louis Area**

St. Louis is the primary city of the two-state St. Louis, MO-IL MSA that includes the City of St. Louis, seven counties in Missouri, and eight counties in Illinois. The consolidated statistical area (CSA) of which St. Louis is the central city includes two additional micropolitan statistical areas (Centralia, IL, and Farmington, MO) with an additional two counties. The urbanized portion of this area includes substantial portions of the St. Louis MSA, but the outer micropolitan statistical areas do not contain significant urbanization relative as compared to the central St. Louis area. The St. Louis area was designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. Based on analysis of air quality, emissions, meteorological data, and other factors considered in determining those designations, EPA promulgated a St. Louis, MO-IL nonattainment area that included the urban core of this area, including the City of St. Louis and four counties in Missouri and three counties plus a portion of a fourth county in Illinois. There are attaining monitors in Franklin, Jefferson, St. Louis, and St. Charles Counties and St. Louis City, as shown in Table 3. No data for Illinois are shown in Table 2 because no site in Illinois has sufficiently complete data for computing a reliable design value.

**Table 3. Air Quality Data collected at Regulatory Monitors (all DV levels in µg/m<sup>3</sup>)<sup>a</sup>**

County, State	Monitor Site ID	State Rec NA?	09-11 DV	10-12 DV	11-13 DV
Franklin, MO	N/A	No	No monitor		
Jefferson, MO	290990019	No	10.3	10.1	9.8
St. Louis, MO	291893001	No		10.9	10.9
St. Louis City, MO	295100085	No	12	11.7	11.1
St. Charles, MO	N/A	No	No monitor		

<sup>a</sup>Where a county has more than one monitoring location, the county design value is indicated in red type.

The TSD for EPA's designation of the St. Louis area for the 1997 standard provided an extensive review of air quality data, emissions data, population, motor vehicle travel, meteorology, and

other related factors. While the Illinois air quality data are not sufficiently complete to provide a reliable indication of the magnitude of concentrations at this time, the available air quality data suggest that the spatial distribution of exposure to PM<sub>2.5</sub> is similar to the distribution EPA found in 2005, when it promulgated the St. Louis 1997 PM<sub>2.5</sub> nonattainment area. Furthermore, a current review of the distribution of emissions, population, and vehicle travel also shows a similar distribution of these parameters, with St. Louis County having approximately a fourth of the emissions of the various relevant pollutants and more than a fourth of the area's population and vehicle travel, and other surrounding counties in Missouri and Illinois and the City of St. Louis also having significant nearby emissions, population and vehicle travel. This review therefore suggests that if the St. Louis area is violating the NAAQS, the area that EPA finds would likely be contributing to that violation is the same area as EPA found in 2005 to contribute to violations of the 1997 PM<sub>2.5</sub> NAAQS.

In conjunction with its recommendations, Missouri submitted extensive documentation intended to demonstrate that occasions when the Granite City monitor in Illinois exceeds the NAAQS, the Missouri portion of the St. Louis area should not be considered to contribute to those occurrences of elevated concentrations. While this monitor has historically recorded the highest concentrations in the area, Missouri's analysis is tied to particular measurements at this monitor, many of which the EPA has subsequently found to be unreliable. Therefore, this TSD does not provide a detailed review of Missouri's analysis. Furthermore, all data collected during the year are important when determining contributions to an annual standard such as the 2012 annual PM<sub>2.5</sub> NAAQS. Compliance with an annual NAAQS is dependent upon monitor readings throughout the year, including days with monitored ambient concentrations below the level of the NAAQS. For the 2012 annual PM<sub>2.5</sub> NAAQS, the annual mean is calculated as the mean of quarterly means. A high quarter can heavily influence the mean for an entire year, which, in turn, can contribute to an elevated 3-year design value. When 3 consecutive years of quality assured, certified data are available for the St. Louis, IL-MO PM<sub>2.5</sub> unclassifiable area, Illinois, Missouri or the EPA may initiate the redesignation process. The CAA provides the EPA with discretion regarding whether and when to initiate a redesignation process. The EPA may consider air quality data, planning and control considerations, or any other air quality-related considerations the Administrator deems appropriate. As a result of these potential future analyses, the boundaries of any potential future nonattainment area may not be the same as the boundary for the St. Louis, MO-IL unclassifiable area.

Based on this analysis, EPA is designating a St. Louis, MO-IL unclassifiable area that includes the same area as was designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. Thus, the EPA is designating an unclassifiable area that includes St. Louis City and Franklin, Jefferson, St. Charles, and St. Louis Counties in Missouri and Madison, Monroe, and St. Clair Counties and Baldwin Township in Randolph County in Illinois. The EPA is designating all other portions of Missouri as unclassifiable/attainment.

### **Davenport-Moline-Rock Island, IL Area**

The Davenport- Moline-Rock Island, IA-IL MSA includes Rock Island, Henry and Mercer Counties in Illinois and Scott County in Iowa. Both Illinois and Iowa recommended that their

counties within this area be designated as unclassifiable/attainment. The core of the urban area of Davenport, where the majority of the emissions and emissions activities are located, consists of Scott County, Iowa and Rock Island County, Illinois.

As explained above, the EPA is designating all of Illinois unclassifiable at this time. However, analysis is also necessary as to whether the Iowa portion of the Davenport-Moline-Rock Island, IA-IL MSA could be contributing to any potential violations of the NAAQS in the Illinois portion of this MSA. To do so, the EPA has considered information relevant to the five factor analysis for the Iowa portion of the MSA. Below is a brief discussion of the information pertaining to the five factors generally considered for a nonattainment area, including air quality data, emissions data, meteorology, population, and jurisdictional boundaries. Additional analyses for the Davenport-Moline-Rock Island, IA-IL MSA are provided in EPA Docket No. EPA-HQ-OAR-2012-0918, Air Quality Designations for the 2012 PM<sub>2.5</sub> Standards.<sup>4</sup>

For the first factor, the EPA considers air quality information for the area. The Iowa portion of the Davenport area currently has four PM<sub>2.5</sub> monitors located in Scott County, Iowa. All four monitors have complete data showing attainment of the 2012 PM<sub>2.5</sub> NAAQs, with 2011-2013 design values ranging from 10.2 to 10.7 µg/m<sup>3</sup>. As noted above, the EPA does not have reliable monitor data for the monitor located in Rock Island County, Illinois. The Rock Island County monitor has historically measured annual values below the Scott County, Iowa monitors, but given the questions concerning the validity of the monitor data the EPA cannot place too much reliance on this fact. Table 4 shows the 2013 design values for the four Iowa monitors located in Scott County.

**Table 4. Air Quality Data collected at Regulatory Monitors in Davenport (all DV levels in µg/m<sup>3</sup>)**

State	County	Monitor ID	State Recommended Nonattainment?	PM <sub>2.5</sub> Annual Design Value 2009-2011	PM <sub>2.5</sub> Annual Design Value 2010-2012	PM <sub>2.5</sub> Annual Design Value 2011-2013
Iowa	Scott	191630015	No	11.4	11.0	10.2
Iowa	Scott	191630018	No	11.5	11.2	10.4
Iowa	Scott	191630020	No		11.3	10.7
Iowa	Scott	191630019	No			10.6

Historically, the Davenport area has not violated any annual PM<sub>2.5</sub> standards, nor has EPA designated the Davenport area as nonattainment for any 24-hour PM<sub>2.5</sub> standards. Thus, the EPA has not previously established any nonattainment boundary for this area. In the absence of a previously established nonattainment boundary, the EPA has considered relevant information to assess the possibility of contribution to a potential violation of the NAAQS in the Illinois portion of the MSA.

<sup>4</sup> Technical Support Document, December 2014, titled, Davenport-Moline-Rock Island, IL-IA Area Designation for the 2012 Primary Annual PM<sub>2.5</sub> National Ambient Air Quality Standard Technical Support Document, prepared by the Region 7 US EPA.

A review of population data shows an approximate equal split on each side of the respective state lines, with 2010 Rock Island County population of 147,612 and 2010 Scott county population of 165,781. While Henry and Mercer have an additional population of 66,850 combined, the population density in these counties is much less than the two core counties of Rock Island and Scott.

Looking at the emissions data in the Davenport area the EPA notes that there are several sizable point sources in the area, including a power plant in Scott County (MidAmerican Energy Riverside Station). Additional point sources of note include Alcoa (located north and east of all monitors in Scott County), as well as Lafarge North America (located in the Southwest portion of Scott County), and the John Deere facility (located in Rock Island County south of the MidAmerican Energy plant noted above.) Emissions from each of these stationary sources is relatively low, with the highest being approximately 1,511 tons per year of NO<sub>x</sub> and 3,694 tons per year of SO<sub>2</sub> from the MidAmerican Energy Riverside Station.

Overall emissions are similar in the Iowa and Illinois counties in the Davenport area with population related and mobile source emissions in the core areas at the same order of magnitude. The aggregate emissions of direct PM<sub>2.5</sub> and precursor pollutants from the point sources mentioned above are slightly higher in Scott County, but are generally from sources located in an area which would be less likely to impact the Rock Island County portion of the Davenport area, based on the meteorological data.

A review of the meteorological data for the Davenport area indicates winds most frequently from the south, east and west with a smaller northwest component. Since much of the emissions and emissions activity in Scott County comes from sources located to the north and northeast of the monitor in Rock Island, the location of emissions in this county in conjunction with the meteorological data indicate limited potential for impact on concentrations within Illinois, leading EPA to conclude that Scott County should not be considered to be contributing to potential violations in the Rock Island area.

Based on this technical analysis, in accordance with Iowa's recommendation, EPA is designating Scott County, Iowa as unclassifiable/attainment with the remaining three counties in the Illinois portion of the MSA (Rock Island, Henry and Mercer) designated as unclassifiable. The EPA is designating all other counties in Iowa as unclassifiable/attainment as recommended by Iowa.