

St. Louis / Southeast Missouri Area

CURRENT AIR QUALITY

The current and recent past air quality information for 8-hour ozone in the St. Louis area is shown below in Tables STL1 and STL2. The same information is presented for the Cape Girardeau-Perryville area in Tables SE1 and SE2. Tables STL1 and SE1 contain the 4th highest 8-hour ozone concentration for each area and Tables STL2 and SE2 contain the design value for each monitor/year pair. Figures STL1 and SE1 denote the locations of the monitors within the current St. Louis and Southeast Missouri ozone networks.

TABLE STL1

Monitor	4 th High 8-hour Ozone Values (ppb)								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
West Alton	88	85	99	91	77	89	91	89	76
Orchard Farm	86	88	98	90	76	92	92	83	71
Maryland Heights						88	84	94	69
Margaretta	86	80	98	90	72	91	76	91	76
Foley						89	84	88	70
Bonne Terre	86	75	92	83	70	84	77	89	71
Arnold	80	86	93	82	70	92	79	87	68
Sunset Hills	82	88	98	88	70	89	80	89	66
Blair Street						89	76	87	73
Maryville (IL)	78	73	90	88	78	88	77	87	70
Pacific						87	79	85	64
Wood River (IL)	78	78	84	83	73	87	77	86	67
Alton (IL)	76	82	94	89	74	91	79	81	68
E. St. Louis (IL)	84	78	93	79	73	94	77	77	64
Jerseyville (IL)	83	84	100	83	73	83	75	75	69
Houston (IL)	76	77	85	77	64	74	72	79	65
Nilwood (IL)	83	73	85	77	68	77	70	75	65
Queeny Park	88	84	94	86	67	82			
Ferguson	83	81	95	88	68				
Breckenridge		79	93	88	69				
Ladue	80	79	94	82	64				
S. Broadway	81	75	90	84					
Edwardsville (IL)	78	75	90	82	68				
Clark & Tucker	67	71	81	58					

TABLE STL2

Monitor	8-hour Ozone Design Values (ppb)						
	2000-2 Avg.	2001-3 Avg.	2002-4 Avg.	2003-5 Avg.	2004-6 Avg.	2005-7 Avg.	2006-8 Avg.
West Alton	90	91	89	85	85	89	85
Orchard Farm	90	92	88	86	86	89	82
Maryland Heights						88	82
Margaretta	88	89	86	84	79	86	81
Foley						87	80
Bonne Terre	84	83	81	79	77	83	79
Arnold	86	87	81	81	80	86	78
Sunset Hills	89	91	85	82	79	86	78
Blair Street						84	78
Maryville (IL)	80	83	85	84	81	84	78
Pacific						83	76
Wood River (IL)	80	81	80	81	79	83	76
Alton (IL)	84	88	85	84	81	83	76
Jerseyville (IL)	89	89	85	79	77	77	73
E. St. Louis (IL)	85	83	81	82	81	82	72
Houston (IL)	79	79	75	71	70	75	72
Nilwood (IL)	80	78	76	74	71	74	70
Queeny Park	88	88	82	78			
Ferguson	86	88	83				
Breckenridge		86	83				
Ladue	84	85	80				
S. Broadway	82	83					
Edwardsville (IL)	81	82	80				
Clark & Tucker	73	70					

TABLE SE1

Monitor	4 th High 8-hour Ozone Values (ppb)								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Farrar					67	80	80	81	70

TABLE SE2

Monitor	2000-2	2001-3	2002-4	2003-5	2004-6	2005-7	2006-8
	Avg.						
Farrar					75	80	77

The St. Louis, Ste. Genevieve, and Perry County areas do not meet the 8-hour ozone standard based on the 2005-07 and the 2006-08 design value information. The 2005-07 design value for St. Louis was 89 parts per billion (ppb) measured at the West Alton and Orchard Farm monitors located in St. Charles County. The 2006-08 design value for St.

Louis is 85 ppb measured at the West Alton monitor. For the 2005-07 period, there are 13 sites in violation of the standard in the present 8-hour St. Louis nonattainment area. In addition, there are three sites in the region outside the current nonattainment area (including Foley in Lincoln County, Bonne Terre in Ste. Genevieve County and Farrar in Perry County). For the current monitoring period (2006-08), there are 10 sites in violation in the present nonattainment area. Further, the three sites outside the area continue to violate the standard. The Cape Girardeau/ Perryville area does not meet the 8-hour ozone standard based on 2005-07 and 2006-08 design value information. The 2005-07 design value was 80 ppb and the 2006-08 design value is 77 ppb. Bonne Terre has a 2005-07 design value of 83 ppb and a 2006-08 design value of 79 ppb. Based on the 2006-08 design values, the violating counties in the current St. Louis 8-hour ozone nonattainment area are: St. Charles, St. Louis, Lincoln, the City of St. Louis, and Jefferson, in Missouri and Madison County (IL).

Memphis, Tennessee, is a potential upwind metropolitan area for St. Louis and Cape Girardeau/Perryville. The Memphis design values for 2004-06 and 2005-07 were 87 and 89 ppb, respectively.

The department is providing 2006-08 data as part of the final recommendation to EPA, but at this time, we are also providing 2005-07 data. This is due to the fact that the appropriate quality assurance measures are not complete for the 2006-08 dataset at this time. In St. Louis and Southeast Missouri, the difference between the two datasets for Missouri monitors does not impact the overall designation and one unified recommendation is being presented at this time.

ST. LOUIS/SOUTHEAST MISSOURI AREA EMISSION, POPULATION, AND TRAFFIC/COMMUTER INFORMATION

Table STL3 and SE3 illustrate the precursor emissions and population data for the counties in the St. Louis and Southeast Missouri areas. For St. Louis, the emission data illustrates that St. Louis County has the largest VOC and NO_x emissions in the area. The other three counties (Franklin, Jefferson, and St. Charles) and the City of St. Louis in the Missouri portion of the current 8-hour ozone nonattainment area also have very sizable emissions of both precursors (combined emissions of more than 50 tons per day [TPD]). Two counties in the Illinois portion of the current ozone nonattainment area (Madison and St. Clair) also have in excess of 50 TPD combined precursor emissions. Outside the current nonattainment area, Pike, Ste. Genevieve, and Randolph (IL) are the counties with the most precursor emissions (all over 25 TPD). For the Southeast Missouri region and not including counties already mentioned in the St. Louis summary, Cape Girardeau and Scott Counties have the most combined emissions (25 TPD for Cape Girardeau and 20 TPD for Scott).

The population data for the area also provides a similar picture. St. Louis County is the most populated (995,118) followed by St. Louis City (350,759), St. Charles (343,952), Madison – IL (267,347) and St. Clair – IL (261,316). Franklin County also has over 100,000 population (100,045) and St. Francis and Lincoln Counties have populations

over 50,000 persons. All the other counties have less than 50,000 population. Population growth rates over 15 percent between 2000 and 2007 were projected for St. Charles, Monroe (IL), Lincoln, and Warren Counties. Cape Girardeau County has a population of 72,470 and Jackson County (IL) has a population of 58,841 people. The remaining counties in the evaluation area have less than 50,000 population (notwithstanding St. Francois County mentioned above). Figures STL2 and SE2 provides population density information for the areas. In the St. Louis area, there is a continuous area of higher population density that includes all of the City of St. Louis and St. Louis County and a portion of St. Charles, Franklin, Jefferson, St. Clair (IL), and Madison (IL) Counties. St. Francois County has the largest area of higher population density (Farmington) in the counties near, but outside the metropolitan complex. For the Southeast Missouri area, Cape Girardeau County contains the most densely populated area. Scott County also contains an area of higher population density when compared to surrounding counties. Figures STL3 and SE3 provide the urbanized area information for the regions. These figures illustrate a very similar set of information as Figures STL2 and SE2. It is important to note that Warren County has a pattern of continuous urbanization with St. Charles County along Interstate Highway 70.

The overall annual Vehicle Miles Traveled (VMT) information was obtained from the Central Regional Air Planning Association (CenRAP) regional inventory compiled from each state's Department of Transportation grown from 2002 to 2009. The only deviation from this approach was the VMT estimates for the current St. Louis nonattainment area was generated from information provided by the East Gateway Council of Governments. For the St. Louis area, these data illustrate a consistent pattern of higher VMT in the urbanized areas around St. Louis. Seven counties in the current nonattainment area have annual VMT greater than 1 billion miles/year; St. Louis (11.8 billion), City of St. Louis (3.4 billion), St. Clair – IL (3.3 billion), Madison – IL (3.2 billion), St. Charles (2.8 billion), Jefferson (2.0 billion), and Franklin (1.6 billion) Counties. The next highest county VMTs are Crawford (608 million/year) and St. Francois (587 million/year). For the Southeast Missouri region, Cape Girardeau County has the highest VMT with 821 million/year and Scott County has the next highest at (574 million/year). Figures STL4 and SE4 include traffic count information from MoDOT for 2007. This data illustrates the high volume of traffic on the Interstate system in the St. Louis area. It should be noted that the traffic counts in St. Francois County is higher than all of the counties in the area with no Interstate highways. Also, there is a reduction in traffic counts on I-55 south of northern Ste. Genevieve County. Based on this fact, it can be concluded there is increased VMT on the roads in these counties due to local traffic or commuter traffic going to the St. Louis metropolitan area. The traffic count map for Southeast Missouri illustrates a difference in traffic counts between Cape Girardeau County and the remainder of the counties in the Cape Girardeau MSA or surrounding the MSA.

To provide a spatial representation of ozone precursor emissions within the area, two sets of figures have been developed. The first set presented in Figures STL5, STL6, SE5, and SE6 contain point source emission locations for NO_x and VOC, respectively. As expected, the largest numbers of point sources are located in St. Louis County, St. Louis City, Madison County (IL), and St. Clair County (IL). The largest NO_x sources in the

Missouri portion of the region are either large utility point sources or lime/cement kilns in the outlying Missouri counties of the region. The large NO_x sources in Ste. Genevieve County are all kilns as is the largest source in Pike County. There are not a large number of large sources in the Southeast Missouri region, but one power plant is located in both Scott and New Madrid Counties. The second set presented in Figures STL7, STL8, SE7, and SE8 contain the composite low-level emission information for the area (including on-road and non-road mobile, low-level point, and area source emissions). Figure STL7 presents the NO_x information for the area and Figure STL8 presents the VOC information for the area. These two figures also show the highest emission density in the St. Louis County/St. Louis City area some areas of higher emission density in the western portions of St. Clair and Madison Counties in IL as well as St. Francois County in Missouri. (especially for VOC – Figure STL8). Cape Girardeau has the highest emission density in the Southeast Missouri area for both VOC and NO_x as seen in Figures SE7 and SE8.

The St. Louis area has been regulated for VOC/NO_x control under the previous ozone NAAQS. Therefore, there are many emission controls regulations for VOC and NO_x in this area related to reducing ozone formation. The following counties in the St. Louis ozone nonattainment area have a reformulated gasoline (RFG) requirement: St. Louis, St. Louis City, St. Charles, Jefferson, Franklin, Madison (IL), Jersey (IL), Monroe (IL), and St. Clair (IL). Also, the Missouri portion of the St. Louis nonattainment area has a decentralized inspection and maintenance program. In addition, there are several other VOC point and area source regulations in place in the Missouri portion of the nonattainment area:

- 1) petroleum storage transfer (Stage I/II) 10 CSR 10-5.220,
- 2) aerospace manufacturing/rework 10 CSR 10-5.295,
- 3) solvent metal cleaning 10 CSR 10-5.300,
- 4) liquefied cutback asphalt 10 CSR 10-5.310,
- 5) industrial surface coating 10 CSR 10-5.330,
- 6) rotogravure/flexographic printing 10 CSR 10-5.340,
- 7) synthesized pharmaceutical products 10 CSR 10-5.350,
- 8) polyethylene bag sealing operations 10 CSR 10-5.360,
- 9) application of deadeners and adhesives 10 CSR 10-5.370,
- 10) manufacturing of paint, laquer, varnish, enamels 10 CSR 10-5.390,
- 11) manufacturing of polystyrene resins 10 CSR 10-5.410,
- 12) equipment leaks from synthetic organic polymer manufacture 10 CSR 10-5.420,
- 13) bakery ovens 10 CSR 10-5.440,
- 14) offset lithographic printing 10 CSR 10-5.442,
- 15) traffic coatings 10 CSR 10-5.450,
- 16) aluminum foil rolling 10 CSR 10-5.451,
- 17) solvent cleanup operations 10 CSR 10-5.455,
- 18) municipal solid waste landfills 10 CSR 10-5.490,
- 19) volatile organic liquid storage 10 CSR 10-5.500,
- 20) existing major sources (RACT fixups) 10 CSR 10-5.520,
- 21) wood furniture manufacturing 10 CSR 10-5.530,

- 22) batch process operations 10 CSR 10-5.540,
- 23) reactor and distillation processes for synthetic organic chemical manufacture 10 CSR 10-5.550.

Also, Missouri has a statewide open burning rule (10 CSR 10-6.045) and a NO_x RACT rule for major NO_x sources in the St. Louis area (10 CSR 10-5.510). Further, the NO_x SIP call is effective in the eastern one-third of Missouri and includes all the large non-utility boilers and utility boilers in the regional NO_x trading program. Missouri was also included in the Clean Air Interstate Rule (CAIR) for utility control. Also, there is an upwind NO_x regulation in place (10 CSR 6-6.345) for the following counties: Perry, Ste. Genevieve, St. Francois, Washington, and Warren. This regulation requires very large NO_x sources (over 900 tons per ozone season) to either demonstrate less than significant impact on downwind St. Louis or obtain offsets or implement beyond Best Available Control Technology to limit emissions to 900 tons/ozone season.

METEOROLOGICAL IMPACTS IN ST. LOUIS/SOUTHEAST MISSOURI

When evaluating all the meteorological information for the St. Louis and Southeast Missouri areas, the trajectory analysis, the regime analysis, and the windroses), the metropolitan St. Louis area demonstrates the strongest likelihood of contribution to the vast majority of the sites in the ozone network. It is important to note that since the ozone standard is now 75 ppb, the variety of meteorological conditions for the area has increased substantially. The regime analysis conducted to support this recommendation is very similar to the analysis conducted to support the 2003 recommendation. Both sets of analyses show that the highest ozone concentrations occur when there is a high pressure center over the eastern United States with reduced wind speeds or stagnant conditions (southerly components to flow direction are predominant). Stagnation conditions are especially evident when ozone exceedances occur in the areas near downtown St. Louis. The trajectory analysis for the Farrar monitor in Perry County shows that St. Louis is not a frequent contributor to elevated concentration at this monitor. The predominant transport directions for this monitor are between east and south. The Bonne Terre monitor has some impact from the St. Louis area and also components of transport from the east and south to elevated ozone concentrations. The predominant transport directions for this monitor are between north and east.

These types of trajectory analyses give an indication of overall synoptic flow and not specific flow on any exceedance day. However, the patterns associated with these trajectories can be helpful in determining flow patterns for exceedance at the monitors. Also, the 2003-07 windrose for the area during the months with ozone exceedances (April – September) provide that the most predominate wind direction is from the south. Further, the windrose has a very similar pattern for the peak ozone months in Missouri (June – August).

Another analysis was conducted to evaluate the number of 8-hour ozone exceedances within the last 6 years. In the Meteorological Analysis document, Table 12 illustrates the number of exceedances at every monitor. The monitoring network in St. Louis is

extensive and includes near-field upwind sites at Bonne Terre and far downfield monitors like Jerseyville, IL. Between 2003 and 2007, the West Alton monitor (due north of the core emission area) has the highest number of 8-hour exceedances in the network (94). The Orchard Farm monitor (north-northwest of the core emission area) has the second largest number of exceedances at 72. Many of the sites in the network had more than 50 exceedances including the Arnold monitor to the south of the metropolitan area. The Bonne Terre monitor had 41 exceedances of the ozone standard between 2003 and 2007 and Farrar had 36 exceedances between 2004 and 2007. Overall, based on the analysis conducted by the department, the St. Louis and Southeast Missouri areas are impacted by source regions to the south (possibly Memphis) and east (possibly Ohio River Valley) along with local impacts from emission sources within the region.

In response to comments, the department conducted another set of meteorological analysis to evaluate surface flow characteristics for exceedance days at the Bonne Terre, Farrar, and Houston (IL) monitors. The analysis is included in Table 13 of Appendix A and evaluated meteorological conditions from three airport sites in the area: Lambert – St. Louis, Farmington (MO) Regional, and Cape Girardeau Regional to determine the surface flow patterns for all exceedances of the 2008 ozone standard during 2004-08. Each day was evaluated individually to gain an understanding of the local meteorology on these days. In many cases, the surface flow measurements illustrate a typical calm morning with a steady late morning / afternoon flow pattern. A surface flow characteristic was determined and the resultant number of days were summed to more specifically identify the wind directions with the most exceedance days for each site. The Farrar site monitored 36 exceedance days in 2004-08. Sixteen (16) of the days had a strong southerly wind component with many having a specific south-southeasterly component. Another twelve (12) days were found to have a strong easterly wind component. Three (3) days had a northwesterly component, four (4) days did not have a discernible pattern, and one (1) day had a very stagnant flow pattern. This confirms the previous analysis conducted by the department that identified the south and east as the major flow directions for the Farrar monitor. The Bonne Terre site monitored 33 exceedance days in 2004-08. Ten (10) days exhibited a northerly wind component (from St. Louis). An additional ten (10) days exhibited an easterly wind component (from Ste. Genevieve area). The typical southerly flow pattern had eight (8) days with the remaining five days either frontal passages occurred or did not exhibit a consistent flow pattern. This analysis confirms the previous regime and trajectory analyses conducted by the department for these two sites.

URBANIZATION AND OTHER INFORMATION REQUESTED IN THE EPA GUIDANCE

There are two different metropolitan statistical boundaries of interest to the designation process: St. Louis MSA and Cape Girardeau micropolitan statistical area (μ SA). These boundaries are shown with the monitoring site information in Figures STL1 and SE1. As seen in Table STL4, there is population growth from 2000-2020 above 30% for the following counties in the St. Louis area: Lincoln (91% growth), Warren (64% growth), St. Charles (55% growth), Monroe – IL (40% growth), and Jersey – IL (30% growth). The particular areas of interest with respect to growth are St. Charles with over 400,000

people projected in 2020 and Lincoln with almost 75,000 people projected in 2020. It is also important to note that Franklin County is projected to have a population over 110,000 by 2020. It should be noted that the City of St. Louis, St. Louis, St. Clair (IL), Montgomery, and Greene (IL) have a flat or decreasing population between 2000 and 2020 based on these projections. In Southeast Missouri (Table SE4), no counties have projected growth rates of more than 30% between 2000 and 2020. It is noteworthy that Cape Girardeau County is projected to have a population of 80,000 in 2020.

Employment data were also incorporated into Table STL3 and SE3. This data can provide a better understanding about counties with a smaller population, but large industrial/commercial activity. This trend can be found in St. Francois in the St. Louis area and Cape Girardeau in southeast Missouri. St. Francois County has 2006 employment of over 20,000 persons and Cape Girardeau has 2006 employment of nearly 40,000 persons. For St. Louis, the vast majority of people work in the core St. Louis metropolitan area with over 800,000 employees in St. Louis County and St. Louis City.

There are significant geographic or topographic features that impact ozone concentrations in the St. Louis or the Southeast regions of Missouri.

The traffic and commuting pattern information is the final EPA criteria for evaluation. The workplace/resident relationship data was obtained from United States Census Bureau, Longitudinal Employer-Household Dynamics Program via Cornell University for the year 2004. This data is a projection of employees and their employer's block group locations. The department aggregated that information from Missouri's 1.8 million and Illinois' 3.5 million individual block group level data points to summarize the commuter relationships between counties in each region of interest. This data is summarized in Tables STL5 and SE5 and provides a matrix of residence versus employment location. Several important pieces of information can be gained from review of this data for each area.

- 1) The vast majority of employed people who live in the St. Louis nonattainment area work in the area (all over 80%).
- 2) There is limited interconnection between the St. Louis MSA and the Cape Girardeau MSA.
- 3) St. Francois, Warren, Lincoln, and Macoupin (IL) Counties are the most connected to the St. Louis nonattainment area for counties outside the area (all over 5,000 residents working in the St. Louis nonattainment area).
- 4) Ste. Genevieve County is not closely connected to either the St. Louis or Cape Girardeau areas, but is more connected to the St. Louis area.
- 5) Perry County is not closely connected to the St. Louis or Cape Girardeau area, but is more connected to the Cape Girardeau area.

SUMMARY

The two distinct geographic regions in the eastern portion of Missouri (St. Louis and Southeast Missouri) have been considered together thus far in this document. In order to

better understand the impact of each county on the monitors that violate the standard, a summary has been created for each area. The first summary presented is for St. Louis and denotes the impact on the metropolitan area from individual counties and includes all the counties that have violating monitors in the area, including Ste. Genevieve County. The second summary presented is for Southeast Missouri and includes information for only the counties not ultimately included in the St. Louis area. The use of the two different areas will allow for differences between counties to become clearer and help develop rationale for separation of counties “in between” the two distinct areas.

ST. LOUIS

Based on the first test for designation (the monitored violation test) using the 2006-08 design values; St. Charles, St. Louis, City of St. Louis, Jefferson, and Madison (IL) violate the standard in the current nonattainment area and should be designated nonattainment. Further, the Foley monitor in Lincoln County and the Bonne Terre in Ste. Genevieve County also violate the standard. Since these monitors are in violation of the standard, this fact leads to designation as nonattainment for these three counties. As discussed below, the Ste. Genevieve County designation recommendation is for a distinct and separate nonattainment area from the St. Louis area. The final 2006-08 monitoring data may change the required designation for Illinois, but the monitors in Missouri will not monitor attainment based on current 2006-08 data. In order to understand the second test for designation (contribution to monitored violation), the following table summarizes the information for all counties in the evaluation process.

TABLE STL6

County	NAA/ MSA	2009 VOC Total % (TPD)	2009 NOx Total % (TPD)	2007 Pop. % (1000)	Total Non-Met Summary
St. Louis	Yes/Yes	38.9 (105.2)	32.8 (135.0)	38.4 (995)	110.1
St. Louis City	Yes/Yes	14.1 (38.2)	9.6 (39.3)	13.5 (351)	37.2
Madison (IL)	Yes/Yes	11.3 (30.7)	14.4 (59.4)	10.3 (267)	36.0
St. Charles	Yes/Yes	10.5 (28.4)	12.2 (50.2)	13.3 (344)	36.0
Jefferson	Yes/Yes	8.9 (24.1)	12.2 (50.2)	8.3 (216)	29.4
St. Clair (IL)	Yes/Yes	8.7 (23.5)	6.2 (25.4)	10.1 (261)	25.0
Franklin	Yes/Yes	5.4 (14.6)	10.7 (44.0)	3.9 (100)	20.0
Pike	No/No	4.5 (12.2)	9.1 (37.6)	0.7 (18)	14.3
Ste. Genevieve	No/No	2.1 (5.8)	7.3 (30.2)	0.7 (18)	10.1
Randolph (IL)	No/No	2.1 (5.7)	5.3 (21.7)	1.3 (33)	8.7
Montgomery (IL)	No/No	2.7 (7.4)	2.9 (11.7)	1.2 (30)	6.8
Washington (IL)	No/No	2.0 (5.5)	3.9 (16.2)	0.6 (15)	6.5
Lincoln	No/Yes	2.3 (6.1)	1.7 (7.2)	2.0 (52)	6.0
St. Francois	No/No	2.0 (5.5)	1.2 (5.1)	2.4 (63)	5.6
Macoupin (IL)	No/Yes	2.3 (6.3)	1.2 (4.8)	1.9 (48)	5.4
Clinton (IL)	No/Yes	2.0 (5.4)	1.1 (4.7)	1.4 (36)	4.5
Crawford*	No/No	2.1 (5.7)	1.1 (4.4)	0.9 (24)	4.1

Warren	No/Yes	1.7 (4.7)	1.2 (5.1)	1.2 (30)	4.1
Perry	No/No	1.7 (4.6)	1.6 (6.4)	0.7 (18)	4.0
Monroe (IL)	Yes/Yes	1.1 (3.0)	1.1 (4.6)	1.3 (32)	3.5
Jersey (IL)	Yes/Yes	1.2 (3.2)	0.8 (3.3)	0.9 (22)	2.9
Greene (IL)	No/No	1.4 (3.9)	0.9 (3.8)	0.5 (14)	2.8
Montgomery	No/No	1.1 (2.9)	1.1 (4.6)	0.5 (12)	2.7
Bond (IL)	No/Yes	1.2 (3.4)	0.7 (3.1)	0.7 (18)	2.6
Washington	No/Yes	1.0 (2.6)	0.4 (1.7)	0.9 (24)	2.3
Gasconade	No/No	1.1 (2.9)	0.6 (2.5)	0.6 (15)	2.3
Calhoun (IL)	No/Yes	0.5 (1.4)	0.5 (2.2)	0.2 (5)	1.2

* A small portion of Crawford County is located in the St. Louis MSA

Percentages in Table STL6 are based on St. Louis nonattainment area totals and are used to provide a comparative understanding on the overall emission inventory and population of the area. Other parameters, like total Vehicle Miles Traveled (VMT) or population density for each county, could have been evaluated. However, the use of these factors would potentially double count the importance of mobile emissions when using (VMT) or population when considering the use of population density. For the St. Louis area, the following counties in Missouri will receive no additional evaluation due to lack of contribution: Montgomery, Washington, and Gasconade.

The meteorology of ozone formation in the St. Louis region should be considered into this summary, in at least a qualitative fashion. As discussed previously, winds with a southerly component in the eastern portion of Missouri lead to the highest concentrations and most exceedance days at most sites. Sites to the immediate south or west of the St. Louis area in Missouri are exceptions to the previous statement. The Arnold and Bonne Terre monitors have the highest ozone concentrations when winds have a stronger northerly or easterly component. The Pacific monitor has the highest concentrations when the winds are easterly. The Farrar monitor in Southeast Missouri exhibits a pattern of transport from the south and east on nearly all of its ozone exceedance days.

Based on 2006-08 data, the following counties should be included in the St. Louis area based on monitored violation of the ozone standard: St. Charles, St. Louis, City of St. Louis, Jefferson, Lincoln, and Madison (IL). Lincoln County has a violating monitor and is part of the St. Louis MSA and receives downwind impact from sources in the current nonattainment area on all days that monitor exceedances. Lincoln County does not contribute nearly as much to its own ozone problem as upwind St. Louis, but is connected to the St. Louis metropolitan complex and has a tremendous projected population growth rate. Further, there is historical precedent for Lincoln County to be included in the St. Louis nonattainment area due to downwind impact. During the 2003 designation process, EPA included Jersey County (IL) in the St. Louis nonattainment area due to violations of the 1997 ozone standard. As noted previously, the monitor status does not change for sites in this area in Missouri using the 2006-08 design values. However, the Illinois sampling data may demonstrate attainment of the standard at some additional sites in Illinois due to the lower ozone concentrations in 2008.

The five counties in the Missouri portion of the current nonattainment area (St. Louis, St. Charles, Jefferson, Franklin, and the City of St. Louis) all have a sizable amount of precursor emissions and can easily be considered as contributory to elevated ozone concentrations at numerous monitors in the area. These counties form the core along with Madison, St. Clair, and Monroe Counties in Illinois of the St. Louis area. Therefore, these counties have all been recommended for inclusion in the St. Louis nonattainment area due to either monitored violations or their contribution to monitored violations in the St. Louis area.

Pike County, also, contains a very high level of VOC (12 TPD) and NO_x (38 TPD) emissions. The population growth rate and population for Pike County are low compared to the counties in the St. Louis area. Pike County is also rural and does not have any sizable urbanization, population density, or connection to the St. Louis area. Further, this county is downwind for a large majority of ozone exceedance days around St. Louis. Currently, the Department is working with one of the two large NO_x sources in Pike County to reduce NO_x emissions as part of the Best Available Retrofit Technology component of the regional haze State Implementation Plan. In December, this source informed the department that a shutdown of its kiln system would occur in March 2009. Pike County was not recommended for inclusion in the St. Louis area due primarily to the predominantly downwind nature of Pike County from the metropolitan area.

Lincoln County sources emit a moderate level of emissions for both ozone precursors (6.1 TPD – VOC and 7.2 TPD – NO_x). The projected population growth rate for Lincoln County is 92 percent and the overall projected population in 2020 is nearly 75,000 people. Lincoln County has the largest number of residents working in the current St. Louis nonattainment area from outside the area (nearly 10,000). Lincoln County has been recommended for inclusion in the St. Louis nonattainment area based on the evaluation of all the criteria. Its inclusion is primarily due to the facts that it is part of the St. Louis MSA and its monitored violation is being impacted predominantly by the current St. Louis nonattainment area. It is important to note that Lincoln County has not been found to contribute significantly to other monitors in the St. Louis area (outside the Foley monitor).

Ste. Genevieve County is being recommended for designation as nonattainment due to a monitored violation. Therefore, the only potential difference in the recommendation is the inclusion of Ste. Genevieve County in the St. Louis nonattainment area, the inclusion in the Southeast Missouri nonattainment area, or as a separate and distinct area.

The bases for this decision are complex, are contingent upon a comprehensive evaluation of the applicable EPA guidance, and include the following: (1) emissions in the area, (2) population of the area, (3) growth patterns, (4) urbanization of the area, (5) jurisdictional boundaries (6) commuter connection to one or more statistical areas, (7) control of the emission sources in the area, and (8) frequency of impact from St. Louis and Southeast Missouri emission sources on the Bonne Terre monitor and the impact from Ste. Genevieve emission sources on both the other areas (e.g. meteorological analysis). Ste. Genevieve County sources emit a very high level of NO_x emissions (30 TPD). The VOC

emissions for this county are (5.8 TPD). The population growth rate is flat between 2000 and 2020 and the 2007 population for Ste. Genevieve County is 17,841 (very low compared to other counties in the area). Ste. Genevieve County is very rural and has only a small component of high population density around the town of Ste. Genevieve. Ste. Genevieve is not part of the St. Louis metropolitan statistical area and the traffic patterns/connectivity data exhibit a small connection to the St. Louis area. The current community planning and transportation groups in the area are not affiliated with the St. Louis region. In addition, there is no sizable commuter connection to Perry County or the Cape Girardeau μ SA. The current level of proposed control in Ste. Genevieve County includes an Innovative Control Technology (selective non-catalytic reduction) on the Holcim cement kiln. The kiln is one of three large point sources in the county and is scheduled to begin operation in 2009 and was included in the emission inventory for Ste. Genevieve County. Based on the updated meteorological analysis, the number of days with ozone impacts from the St. Louis area and the Ste. Genevieve source area are identical – 10 each. The frequency of impact is an important consideration because EPA guidance recommends that a violating monitor and its impacting sources be designated in the same nonattainment area. The impacts of both St. Louis and Ste. Genevieve emission sources along with the elevated regional ozone contribute to exceedance level concentrations at the Bonne Terre monitor.

Several comments were received that concluded Ste. Genevieve County should be recommended for a nonattainment designation, but should not be included in the St. Louis area. Two comments were received that supported the inclusion of Ste. Genevieve County in the St. Louis area. The commenters that wanted to include Ste. Genevieve County in the St. Louis area focused on the downwind ozone impact from the point source NO_x emissions. The comments related to exclusion of Ste. Genevieve from the area were focused on the rural nature of Ste. Genevieve, the lack of commuter connection to the St. Louis area, the historical differences in the planning process within southeast Missouri and St. Louis, the fact that the vast majority of emissions are originating from three facilities in Ste. Genevieve County, and the proposed new controls for one of the large NO_x sources (cement kiln due to begin operation in 2009) are already innovative control technology. Further, some commenters wanted to see a combined area for Ste. Genevieve and any other counties designated in southeast Missouri.

While not explicitly required in the designation guidance, an understanding of the possible requirements under the Clean Air Act is beneficial to this discussion. Unless EPA changes the requirements for ozone nonattainment areas dramatically, the NO_x emissions from these three large point sources will require a Reasonably Available Control Technology (RACT) evaluation whether the sources are included in the Ste. Genevieve or St. Louis nonattainment areas. Further, while there can be no official finding of RACT for any one of these sources, the Holcim – Lee Island plant has installed a selective non-catalytic reduction system for NO_x control. This control was found by the department, at the time of permit issuance, to be innovative control technology above the required Best Available Control Technology required in attainment areas. The inclusion of an inspection and maintenance program and Stage I/II gasoline vapor recovery for Ste. Genevieve would not provide sufficient ozone concentration impact at

either the Bonne Terre monitor or downwind St. Louis monitors, but would be costly to business and citizens in the county. It is the department's conclusion that the designation of Ste. Genevieve County as nonattainment will address the potentially necessary point source controls and that inclusion in the St. Louis area will not expedite those controls or the ultimate attainment of the standard in either Ste. Genevieve or downwind St. Louis.

In addition, based on the surface meteorological evaluation, the impacts from Ste. Genevieve sources on the Farrar monitor in Perry County are infrequent. The inclusion of Ste. Genevieve in the Southeast Missouri nonattainment boundary recommendation is not warranted based on the lack of connection to the area and the infrequent contribution to the Farrar monitor, but is supported by the current regional planning commission inclusion of both areas.

There are several reasons for consideration of Ste. Genevieve as a separate and distinct nonattainment area: (1) the strong desire of the Ste. Genevieve County government for independent air quality planning separate from the St. Louis area, (2) the fact that the NO_x emissions are primarily from a set of large industrial facilities and not a variety of different sources, (3) the likelihood of consistent control outcomes from a nonattainment designation as a stand-alone area when compared to inclusion in the St. Louis area, (4) the very rural nature of the county, (5) the fact that Ste. Genevieve is not inside the current St. Louis MSA, (6) the lack of strong commuter connection to the current St. Louis nonattainment area, and (7) the small population and lack of projected growth. Notwithstanding, the upwind nature of the county and the large amount of NO_x emissions generated in Ste. Genevieve; the department is recommending that Ste. Genevieve County be designated a distinct nonattainment area.

St. Francois County sources emit a moderate level of both ozone precursors (5.5 TPD – VOC and 5.1 TPD NO_x). The projected population growth rate is 25 percent between 2000 and 2020 and the overall projected 2020 population is nearly 70,000 people. Further, St. Francois County has over 6,000 residents working in the current St. Louis nonattainment area. St. Francois County also has area of high population density and urbanization near Farmington. This county is much more urbanized and connected to the St. Louis area than Ste. Genevieve County. The Farmington micropolitan statistical area is part of the St. Louis/Farmington Combined Statistical Area (CSA). However, upon review of comments from stakeholders in St. Francois County and the Southeast Missouri Regional Planning Commission, the department re-evaluated the Bonne Terre monitor as a representative site for St. Francois County. There is no specific guidance on the use of a single monitor as being representative of multiple counties or on the representative distance of a monitor. Therefore, the department has found there is sufficient uncertainty as to whether St. Francois County meets the air quality standard to make a recommendation for designation as unclassifiable with respect to the monitoring status of the county. Also, the department utilized the same surface meteorological analysis detailed above to more thoroughly investigate the relationship between the emissions in St. Francois and ozone impacts in the area (including the Bonne Terre monitor). This analysis illustrated very little evidence of emissions from St. Francois County impacting exceedance days at the Bonne Terre monitor. It is important to note that St. Francois

County was not found to significantly contribute to other monitors in the St. Louis area due to limited connection to the area and lack of precursor emissions. Therefore, the department has found that St. Francois County emissions do not contribute to monitored violations of the standard and the county is being recommended as unclassifiable based on the uncertainty associated with the monitored concentrations at the Bonne Terre site.

Crawford County has combined ozone precursor emissions of almost 10 TPD (VOC – 5.7 TPD and NO_x – 4.4 TPD). The project population growth rate for Crawford County is 16 percent between 2000 and 2020, but the projected population is still less than 30,000 people. Crawford County has nearly 3,000 commuters to the current nonattainment area and limited areas of population density and urbanization along Interstate 44. There is one portion of northern Crawford County (Sullivan) that is part of the St. Louis MSA. However, the conclusion of the contribution evaluation is that Crawford County does not contribute to the St. Louis area and should be designated attainment for the 2008 ozone standard.

Warren County has less than 10 TPD of ozone precursor emissions (4.7 TPD – VOC and 5.1 TPD – NO_x). The projected population growth rate is 64 percent between 2000 and 2020 and the projected population is over 40,000 people for Warren County. The eastern portion of Warren County has an area of continuous urbanization extending along Interstate 70 from St. Charles County. Warren County is part of the St. Louis MSA and has nearly 6,000 residents employed in the current St. Louis nonattainment area. The downwind nature of this county under predominant meteorological conditions is an important finding during this evaluation. Overall, Warren County has not been found to contribute to downwind violations of the ozone standard and has been recommended for a designation of attainment.

Perry County has 11 TPD of combined precursor emissions (4.6 TPD – VOC and 6.4 TPD – NO_x). The projected population growth rate is 11 percent between 2000 and 2020 and the 2020 projected population is slightly over 20,000 people. Perry County is not contiguous with the St. Louis MSA and is contiguous with the Cape Girardeau μSA. The number of residents employed in the current St. Louis nonattainment area is 750. This information leads to the conclusion that Perry County does not contribute to the downwind St. Louis monitoring area (not nearby contribution) and should not be part of the St. Louis nonattainment area based on the second contribution test.

Even though Washington County is part of the St. Louis MSA, its emission totals do not warrant additional consideration for inclusion in the St. Louis nonattainment area.

SOUTHEAST MISSOURI

TABLE SE6

County	Cape Gir μSA/ Adjacent	2009 VOC Total % (TPD)	2009 NOx Total % (TPD)	2007 Pop. % (1000)	Total Non-Met Summary
Cape Girardeau	Yes	58.7 (9.0)	62.6 (16.8)	77.8 (72)	199.1
Ste. Genevieve	No/No	37.8 (5.8)	112.2 (30.2)	19.2 (18)	169.2
Randolph (IL)	No/No	37.5 (5.7)	80.7 (21.7)	35.3 (33)	153.5
Jackson (IL)	No/No	58.4 (8.9)	26.0 (7.0)	63.4 (59)	147.8
Scott	No/Yes	43.2 (6.6)	52.7 (14.2)	43.9 (41)	139.8
St. Francois	No/No	36.1 (5.5)	19.0 (5.1)	67.7 (63)	122.8
Perry	No/Yes	29.8 (4.6)	23.8 (6.4)	20.3 (19)	73.8
Alexander (IL)	Yes	29.6 (4.5)	21.8 (5.9)	9.1 (8)	60.5
Union (IL)	No/Yes	18.2 (2.8)	16.3 (4.4)	19.7 (18)	54.1
Bollinger	Yes	11.8 (1.8)	15.6 (4.2)	13.1 (12)	40.5

Percentages in Table SE6 are based on Cape Girardeau μSA totals and, again, are used to provide a comparison for counties in the area. For the Southeast Missouri region, Bollinger and Union (IL) Counties will receive no additional evaluation due to lack of contribution.

Perry County is in violation of the ozone standard and is not strongly connected to St. Louis (somewhat distant from the area) and sources within the county do not have sufficient ozone precursor emissions to warrant inclusion within the St. Louis area. Further, the downwind impact from St. Louis is not frequent to the Farrar monitor in Perry County. Perry County is contiguous with the Cape Girardeau μSA and the impact of the counties within the μSA and surrounding on the Farrar monitor has been evaluated in the same manner as the St. Louis evaluation.

Cape Girardeau is the metropolitan core area in the vicinity of the violating monitor. The combined emissions for this county are over 25 TPD (9.0 VOC and 16.8 NOx). Cape Girardeau County has a definitive employment (37,000) and population (2020 – 80,000) base separate from St. Louis. All the different meteorological data support the contribution of Cape Girardeau County to the Farrar monitor. The meteorological findings consistently illustrate a frequent contribution from sources to the south and east of the monitor. Nonetheless, there is no strong commuter connection between Perry and the Cape Girardeau μSA. Further, there are no additional regulations for control of ozone precursors in Southeast Missouri (outside the NOx SIP call and the Clean Air Interstate Rule – CAIR). The level of emissions and meteorological analyses along with the contiguous boundary between Perry and Cape Girardeau lead to the conclusion that Cape Girardeau County has a frequent contribution to the “nearby” ozone monitor at Farrar.

Several comments were received regarding the exclusion of Cape Girardeau County from the Southeast Missouri nonattainment area recommendation. These comments focused

on the contention that the Farrar site is being influenced by high regional ozone and Cape Girardeau County emission sources do not contribute significantly to the violations at Farrar. In order to address this comment, the department conducted three sets of analyses. The first set is the same surface meteorological analyses conducted for the Bonne Terre monitor discussed previously. There were thirty-six (36) days that monitored exceedances of the 2008 ozone standard at the Farrar monitor. The results of the surface meteorological analyses were sixteen (16) days with a strong southerly/southeasterly component, twelve (12) days with a strong easterly component, three (3) days with a northwesterly component, one (1) day with extremely calm winds, and four (4) days with no distinctive pattern. This illustrates the same finding as the previous meteorological analysis conducted for the area. The vast majority of days with exceedances at the Farrar monitor have southerly and easterly wind directions. Cape Girardeau County is south of the Farrar monitor with the cities of Jackson and Cape Girardeau to the south and south-southeast of the monitor. In addition, the city of Carbondale in Jackson County, IL is due east of the monitor.

The second analysis included an evaluation of ozone concentration data from the Farrar and Houston (IL) monitors that are located to the south of St. Louis. The reason for this analysis was to provide an idea of regional ozone concentrations on days with exceedances at the Farrar monitor. The Houston (IL) monitoring site is also south and east of the St. Louis area, but is not directly influenced by any nearby communities when winds are from the east or south. This evaluation was conducted using the same dataset as the first analysis and identified days with a strong southerly or easterly component. After the wind direction evaluation, an 8-hour maximum concentration difference was calculated between the Farrar and Houston (IL) sites to provide a “local” impact for those days at the Farrar monitor. The local impact on the 16 south/southeasterly days ranged from 5 to 14 ppb with an average of 9.4 ppb. The local impact on the 12 easterly days ranged from 4 to 11 ppb with an average of 7.5 ppb. It is important to note this evaluation does not isolate Cape Girardeau County or southern Illinois counties contributions exclusively because it is wind direction specific and not emission specific. The large NOx point source emissions to the south of Cape Girardeau County and the Memphis metropolitan area do have an impact on this monitor, but also impact the Houston (IL) monitor. However, the proximity of the monitors does allow for a comparison between local and regional influence. The finding here is that nearby emissions to the south and east of the Farrar monitor have a significant impact on violations.

The last set of analyses included a photochemical modeling evaluation using the 2009 St. Louis 8-hour ozone attainment demonstration. This analysis was aimed at providing a modeled concentration for the emissions from Cape Girardeau County on the surrounding grid cells. To be clear, this evaluation used days with lower predicted concentrations (50-70 ppb) in southeast Missouri due to the fact that the 45-day meteorological episodes simulated in the attainment demonstration were developed for St. Louis exceedance days and not southeast Missouri exceedance days. The analysis used the CAMx modeling system with Anthropogenic Precursor Culpability Analysis (APCA) for 2009 emissions and the 2002 meteorological data in the attainment demonstration. This type of

culpability analysis excludes the biogenic portion of the ozone impact and focuses on only man-made emissions from a particular geographic area. The model is able to predict the impact from these emissions on any grid cell in the domain for each day. The overall impact from Cape Girardeau County emissions ranged from near 0 ppb to 6 ppb on nearby grid cells during this simulation. It is critical to understand the magnitude of this contribution when compared to other findings of significance for ozone. During the NO_x SIP call rulemakings, EPA defined significant contribution for ozone as a modeled impact of 2 ppb from an entire state on another downwind state. In the Control of NO_x Emissions From Upwind Sources rule for St. Louis (10 CSR 10-6.345), the department defined a 1 ppb impact on the downwind area as the threshold for additional controls on a single source upwind of St. Louis. Therefore, a maximum impact of six ppb (on a day with relatively low concentrations) could easily be defined as significant under any of the previous regulations. Also, this impact is comparable to the local impacts from the south under the second analysis. Any one of these analyses can not be utilized to determine the exact impact from Cape Girardeau emission sources on the Farrar monitor, but provide useful information regarding the range of ozone impacts.

The conclusions of all these additional analyses further support the finding that Cape Girardeau County contains emission sources that contribute to ozone violations in Perry County. It is important to note that the department found that sources in Cape Girardeau County do not have a frequent or significant contribution impact on the Bonne Terre monitor and sources in Ste. Genevieve or St. Francois Counties do not a frequent impact at the Farrar monitor.

The violations at the Perry County monitor represent a new type of ozone problem. The violations are not directly caused by emissions from metropolitan areas with larger populations as commonly found under previous ozone standards, but are the combined result of ozone and precursor transport with additional contribution from a nearby set of emissions. The department has concerns regarding the regulatory impacts on sources and the communities in these more rural areas because the Clean Air Act Amendments of 1990 did not envision non-metropolitan areas being designated nonattainment. Therefore, the air quality planning for these new areas need to be decidedly different than the original planning contemplated under the CAAA. The department believes the area could attain the ozone standard over the next few years given the additional NO_x control provided by the Clean Air Interstate Rule on electric utilities in the eastern United States and the corresponding ozone impact. In addition, the Cape Girardeau community leaders have begun an evaluation of control measures that could be undertaken by the communities in Cape Girardeau County to reduce ozone impacts in Southeast Missouri. The department fully supports the work of local communities to develop air quality controls or plans that reduce the impact of the community on air quality problems. This type of proactive approach puts the community leadership in a strong position to address air quality issues and provide “local” solutions to any and all problems. In consideration of the above issues, the department is recommending a designation of unclassifiable for Cape Girardeau County.

As discussed previously, the impact on the Farrar monitor from Ste. Genevieve County is not frequent (3 of 36 days) and does not provide sufficiency to include Ste. Genevieve County in the same nonattainment area as Perry County based on contribution.

The only remaining Missouri County worthy of evaluation pursuant to the Perry County monitor is Scott County. Scott County is not a part of the Cape Girardeau μ SA. Also, Scott County is located south of Cape Girardeau County and, therefore, has more distance to the Farrar ozone site from emission sources than Cape Girardeau County. The emissions from Scott County are driven by a large power plant in the extreme southern portion of the county (farthest from Perry). The combined emission total is slightly more than 20 TPD (6.6 TPD – VOC and 14.2 TPD – NO_x). Further, the meteorological analysis supports potential contribution from Scott County emissions to the Farrar monitor. The power plant NO_x emissions are controlled by the NO_x SIP call and CAIR. There is no strong commuter connection between Scott and Cape Girardeau Counties (as well as none between Scott and Perry Counties). Based on this information, Scott County is not being recommended for inclusion in the Southeast Missouri nonattainment area based on contribution to the “nearby” Farrar monitor.

To summarize, the recommendation for designations in the Missouri portion of the St. Louis and Southeast Missouri regions are as follows:

St. Louis Nonattainment Area

Franklin, Jefferson, Lincoln, St. Charles, and St. Louis Counties, and the City of St. Louis

Ste. Genevieve Nonattainment Area

Ste. Genevieve County

Southeast Missouri Nonattainment Area

Perry County

Unclassifiable

St. Francois and Cape Girardeau Counties

All other counties in the region attainment/unclassifiable

COUNTY BY COUNTY SUMMARY

The following is a county-by-county summary of the factors that were considered in the inclusion/exclusion evaluation for the St. Louis and Southeast 8-hour ozone nonattainment areas. These factors include precursor emissions, air quality data, population, urbanization, commuter/traffic patterns (“connectivity”), meteorology, growth, and jurisdictional boundaries. In addition, if special consideration should be given to some additional factors (i.e. location of emission sources in the county or distance from the core metropolitan area), this is also presented. All factors in the

applicable EPA guidance were considered, but some are not relevant to the area (i.e. geography/topography).

ST. LOUIS

St. Louis County

- 1) Largest emissions for both VOC (105.2 TPD) and NO_x (135.0 TPD) in the St. Louis area
- 2) All monitors within the county monitor a violation of the standard (highest design value – Maryland Heights 82 parts per billion [ppb] for 2006-08)
- 3) Largest population in the area (995,118)
- 4) Largest annual VMT in the area (11.8 billion VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) Population reduction predicted between 2000 and 2020 (-4%)
- 7) Located in the current 8-hour ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

St. Louis City

- 1) Second largest emission in St. Louis for VOC (38.2 TPD) and fifth largest for NO_x (39.3 TPD)
- 2) Both monitors within the city monitor a violation of the standard (highest design value – Margareta 81 ppb for 2006-08)
- 3) Second largest population in the area (350,759)
- 4) Second largest VMT in the area (3.4 billion VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) Flat population projection between 2000 and 2020
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

Madison County (IL)

- 1) Second largest emission in St. Louis for NO_x (59.4 TPD) and third largest for VOC (30.7 TPD)
- 2) All monitors within the county monitor a violation of the standard (highest design value – Maryville 78 ppb for 2006-08)
- 3) Fourth largest population in the area (267,347)
- 4) Fourth largest VMT in the area (3.2 billion VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) 10% population growth projection between 2000 and 2020
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

St. Charles County

- 1) Third (tied) largest emission in St. Louis for NO_x (50.2 TPD) and fourth largest for VOC (28.4 TPD)
- 2) Both monitors within the county monitor a violation of the standard (highest design value – West Alton 85 ppb for 2006-08)
- 3) Third largest population (343,952)
- 4) Fifth largest VMT in the area (2.8 billion/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) 55% population growth between 2000 and 2020 (over 400,000 in 2020)
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

Jefferson County

- 1) Third (tied) largest emission in St. Louis for NO_x (50.2 TPD) and fifth largest for VOC (24.1 TPD)
- 2) Monitor within the county monitors a violation of the standard (Arnold design value 78 ppb for 2006-08)
- 3) Population over 200,000 (216,076)
- 4) Sixth largest VMT in the area (2.0 billion/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) 23% population growth between 2000 and 2020 (nearly 250,000 in 2020)
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

St. Clair County (IL)

- 1) Combined emissions nearly 50 TPD (VOC – 23.5 TPD and NO_x - 25.4 TPD)
- 2) Monitor within the county monitors a violation of the standard for 2005-07, but is compliance for 2006-08 (E. St. Louis design values 82 ppb for 2005-07 and 72 ppb for 2006-08)
- 3) Population over 250,000 people (261,316)
- 4) Third largest VMT in the area (3.3 billion VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) Flat population projection between 2000 and 2020
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

Franklin County

- 1) Combined emissions over 50 TPD (VOC – 14.6 TPD and NO_x - 44.0 TPD)

- 2) No current monitoring in county – closest monitor (Pacific in western St. Louis County has a design value of 76 ppb for 2006-08)
- 3) Population over 100,000 people (100,045)
- 4) High VMT in the area (1.6 billion VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) 18% population growth between 2000 and 2020
- 7) Located in the current St. Louis ozone nonattainment area
- 8) Emission reductions have been realized from previous VOC/NOx control requirements

Pike County

- 1) Combined emissions of nearly 50 TPD (VOC - 12.2 TPD and NOx - 37.6 TPD)
- 2) No ozone monitoring in county
- 3) Population of less than 20,000 (18,471)
- 4) Limited connection to the St. Louis metropolitan area
- 5) Low VMT (315 million VMT/year)
- 6) Meteorological analysis shows limited contribution to all St. Louis monitors
- 7) Flat population projection between 2000 and 2020
- 8) Located adjacent to the St. Louis MSA, not adjacent to current nonattainment area
- 9) NOx emission reduction in future, due to BART controls

Ste. Genevieve County

- 1) Combined emissions over 30 TPD (VOC - 5.8 TPD and NOx – 30.2 TPD)
- 2) Bonne Terre monitor in violation of the standard (design value – 79 ppb for 2006-08)
- 3) Population of less than 20,000 (17,841)
- 4) Limited connection to St. Louis metropolitan area (along I-55)
- 5) Low VMT (412 million VMT/year)
- 6) Meteorological analysis is supportive of frequent contribution to St. Louis
- 7) Flat population projection between 2000 and 2020
- 8) Located adjacent to the current St. Louis nonattainment area, but not in MSA
- 9) Designation of separate nonattainment area will provide control on existing major sources and a nonattainment permitting program to address Ste. Genevieve emission impacts
- 10) Existing planning infrastructure that is distinct from St. Louis (jurisdictional boundaries)

Randolph County (IL)

- 1) Combined emissions over 25 TPD (VOC - 5.7 TPD and NOx – 21.7 TPD)
- 2) Houston monitor demonstrates attainment of standard (design value – 72 ppb for 2006-08)
- 3) Population of less than 50,000 (32,760)
- 4) Limited connection to the St. Louis metropolitan area

- 5) Low VMT (300 million VMT/year)
- 6) Meteorological analysis is somewhat supportive of frequent contribution
- 7) 5% projected population growth between 2000 and 2020
- 8) Located adjacent to the St. Louis MSA, portion of county including largest source was included in the St. Louis PM2.5 nonattainment area
- 9) Largest NOx source is a power plant subject to Illinois multi-pollutant strategy

Montgomery and Washington Counties (IL)

- 1) Combined emissions nearly 20 TPD (Montgomery/Washington VOC -2.7/2.0 TPD and NOx -11.7/16.2 TPD)
- 2) No ozone monitoring in counties
- 3) Population of less than 30,000 (Montgomery 29,810 and Washington 14,769)
- 4) Limited connection to the St. Louis metropolitan area
- 5) Medium/Low VMT (Montgomery 581 million and Washington 396 million VMT/year)
- 6) Meteorological analysis limited support for frequent contribution
- 7) Both counties are projected to grow less than 10% between 2000 and 2020 (2020 population of less than 35,000 for both)
- 8) Both located adjacent to MSA and current St. Louis nonattainment area

Lincoln County

- 1) Combined emissions under 15 TPD (VOC - 6.1 TPD and NOx – 7.2 TPD)
- 2) Foley monitor in violation of 1997 standard (2006-08 design value – 80 ppb)
- 3) Population of more than 50,000 (51,528)
- 4) 9,467 residents work in current St. Louis nonattainment area
- 5) Medium VMT (530 million VMT/year)
- 6) Meteorological analysis is not supportive of frequent contribution
- 7) 2nd highest population growth rate in Missouri between 2000 and 2020 (91%)
- 8) Located adjacent to the current St. Louis nonattainment area and in the St. Louis MSA

St. Francois County

- 1) Combined emissions under 15 TPD (VOC - 5.5 TPD and NOx – 5.1 TPD)
- 2) No ozone monitoring in county
- 3) Population of more than 50,000 (62,810)
- 4) Largest amount of working residents outside the St. Louis MSA work in the current St. Louis nonattainment area (6,144)
- 5) Medium VMT (587 million VMT/year)
- 6) Meteorological analysis is supportive of frequent contribution
- 7) 25% population growth between 2000 and 2020 (nearly 70,000 in 2020)
- 8) Located adjacent to the current St. Louis nonattainment area and the St. Louis MSA; part of the St. Louis/Farmington CSA

Macoupin and Clinton Counties (IL)

- 1) Combined emissions nearly 10 TPD (Macoupin/Clinton VOC -6.3/5.4 TPD and NO_x -4.8/4.7 TPD)
- 2) Design value for Macoupin (Nilwood) is 74 ppb in 2005-07; No ozone monitoring in Clinton
- 3) Population of less than 50,000 (Macoupin 48,235 and Clinton 36,450)
- 4) Limited connection to the St. Louis metropolitan area
- 5) Medium/Low VMT (Macoupin 514 million and Clinton 420 million VMT/year)
- 6) Meteorological analysis suggest downwind on the St. Louis area under predominant winds
- 7) Both counties are projected to grow less than 25% between 2000 and 2020 (2020 population of less than 60,000 for both)
- 8) Both located in the St. Louis MSA and adjacent to current St. Louis nonattainment area

Crawford County

- 1) Combined emissions nearly 10 TPD (VOC – 5.7 TPD and NO_x – 4.4 TPD)
- 2) No ozone monitoring in county
- 3) Population of less than 30,000 (24,076)
- 4) Limited connection to the St. Louis metropolitan area
- 5) Medium VMT (608 million VMT/year); located on I-44
- 6) Meteorological analysis is somewhat supportive of frequent contribution
- 7) 16% population growth between 2000 and 2020
- 8) A small portion of the county is included in the St. Louis MSA, adjacent to the current St. Louis nonattainment area

Warren County

- 1) Combined emissions under 10 TPD (VOC - 4.7 TPD and NO_x – 5.1 TPD)
- 2) No ozone monitoring in county
- 3) Population of less than 50,000 (30,467)
- 4) 9,467 residents work in current St. Louis nonattainment area
- 5) Medium VMT (528 million VMT/year)
- 6) Meteorological analysis is not supportive of frequent contribution
- 7) 64% population growth between 2000 and 2020
- 8) Located adjacent to the current St. Louis nonattainment area and in the St. Louis MSA

Perry County

- 1) Combined emissions under 15 TPD (VOC - 4.6 TPD and NO_x – 6.4 TPD)
- 2) Farrar monitor in violation of the standard (2006-08 design value – 77 ppb)
- 3) Population of less than 20,000 (18,794)
- 4) Very limited connection to the current St. Louis nonattainment area

- 5) Low VMT (366 million VMT/year)
- 6) Meteorological analysis is somewhat supportive of frequent contribution (county is two counties from the St. Louis area)
- 7) 25% population growth between 2000 and 2020 (nearly 70,000 in 2020)
- 8) Not located adjacent to the current St. Louis nonattainment area or the St. Louis MSA

Monroe County (IL)

- 1) Combined emissions under 10 TPD (VOC - 3.0 TPD and NO_x – 4.6 TPD)
- 2) No ozone monitoring in county
- 3) Population of less than 50,000 (32,372)
- 4) Medium VMT (554 million VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution
- 6) 40% population growth rate between 2000 and 2020 (43,000 people in 2020)
- 7) Located in the current St. Louis nonattainment area
- 8) Emission reductions have been realized from previous VOC/NO_x control requirements

Jersey County (IL)

- 1) Combined emissions under 10 TPD (VOC - 3.2 TPD and NO_x – 3.3 TPD)
- 2) Jerseyville ozone monitor is in violation of the standard for 2005-07, but in compliance for 2006-08 (design values of 77 ppb in 2005-07 and 73 ppb in 2006-08); downwind of St. Louis
- 3) Population of more than 30,000 (22,455)
- 4) Low VMT (224 million VMT/year)
- 5) Meteorological analysis is not supportive of frequent contribution
- 6) 30% population growth rate between 2000 and 2020 (28,000 people in 2020)
- 7) Located in the current St. Louis nonattainment area
- 8) Some emission reductions will be realized from latest VOC/NO_x control requirements

Greene, Bond, and Calhoun Counties (IL)

- 1) Combined emissions less than 10 TPD (all VOC less than 4 TPD and all NO_x less than 4 TPD)
- 2) No ozone monitoring in counties
- 3) Populations of less than 20,000
- 4) Limited connection to the St. Louis metropolitan area
- 5) Low VMT (All less than 325 million VMT/year)
- 6) Meteorological analysis suggest downwind on the St. Louis area under predominant winds
- 7) All counties are projected to grow less than 10% between 2000 and 2020 (2020 population of less than 20,000 for all)

- 8) Calhoun and Bond are located in the St. Louis MSA, while all are adjacent to current St. Louis nonattainment area

Montgomery, Washington, Gasconade Counties

- 1) Combined emissions less than 10 TPD (all VOC less than 4 TPD and all NO_x less than 5 TPD)
- 2) No ozone monitoring in counties
- 3) Populations of less than 30,000
- 4) Limited connection to the St. Louis metropolitan area
- 5) Medium/Low VMT (Montgomery – 504 million VMT/year [I-70]; others less than 250 million VMT/year)
- 6) Meteorological analysis suggest Washington County would have frequent contribution; downwind of the St. Louis area under predominant winds for Montgomery and Gasconade
- 7) All counties are projected to grow less than 15% between 2000 and 2020 (2020 population of less than 30,000 for all)
- 8) Washington is located in the St. Louis MSA, the others are not

SOUTHEAST

Perry County

- 1) Combined emissions under 15 TPD (VOC - 4.6 TPD and NO_x – 6.4 TPD)
- 2) Farrar monitor in violation of the standard (2006-08 design value – 77 ppb)
- 3) Population of less than 20,000 (18,794)
- 4) Small connection to the Cape Girardeau μ SA
- 5) Low VMT (366 million VMT/year)
- 6) 25% population growth between 2000 and 2020 (nearly 70,000 in 2020)
- 7) Adjacent to the Cape Girardeau μ SA

Cape Girardeau County

- 1) Combined emissions over 25 TPD (VOC - 9.0 TPD and NO_x – 16.8 TPD)
- 2) No ozone monitoring in county
- 3) Population of more than 50,000 (72,740)
- 4) Medium VMT (821 million VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution to Farrar monitor
- 6) 16% population growth rate between 2000 and 2020 (80,000 people in 2020)
- 7) Cape Girardeau is the center of the μ SA
- 8) Regional ozone analysis and APCA modeling provide evidence of ozone impacts at the Farrar monitor

Jackson County (IL)

- 1) Combined emissions over 15 TPD (VOC – 8.9 TPD and NO_x – 7.0 TPD)
- 2) No ozone monitoring in county
- 3) Population of more than 50,000 (58,841)
- 4) Medium VMT (534 million VMT/year)
- 5) Meteorological analysis is supportive of frequent contribution to Farrar monitor
- 6) 7% population growth rate between 2000 and 2020 (64,000 people in 2020)
- 7) Adjacent to the Cape Girardeau μ SA

Scott County

- 1) Combined emissions over 20 TPD (VOC – 6.6 TPD and NO_x – 14.2 TPD)
- 2) No ozone monitoring in county
- 3) Population of less than 50,000 (40,735)
- 4) Medium VMT (574 million VMT/year)
- 5) Meteorological analysis is somewhat supportive of frequent contribution to Farrar monitor
- 6) 1% population growth rate between 2000 and 2020 (41,000 people in 2020)
- 7) Adjacent to the Cape Girardeau μ SA with some commuter connection to the Cape Girardeau μ SA